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Abstract

In this research, we propose that a product with feminine product presentation can backfire, leading to reduced purchase intention and attitude. The research topic was inspired from an increased trend we have observed over the last few years, where it is more common to advertise supplements as feminine, with feminine product names and descriptions that focus on the looks and appearance of female consumers rather than the objective content and scientifically proven benefits. However, the study started from a different angle, by believing that these marketing efforts were really effective, as they exploit women's insecurities by indicating how your nails, hair, body or femininity will increase when consuming the supplement. After conducting a preliminary test, the results revealed completely opposite outcomes than expected, resulting in an eye-opener as to why this negative effect could arise. We proposed that it might be due to a lack of credibility, where consumers might view the supplements as controversial or cynical, and thus, are less tempted to purchase.

Across one experimental study including a preliminary test, we demonstrate how feminine product presentation of a supplement results in reduced purchase intention and attitude, both alone and through Source Credibility Theory. We conceptualize that a supplement is utilitarian and should therefore be marketed with utilitarian benefits that satisfies the information seeking process for utilitarian necessities. Hence, a feminine product presentation on a supplement backfire as it is non-satisfactory for an information-seeking process and viewed less credible than a scientific product presentation, due to lack of trustworthiness and expertise. We further demonstrate that a hedonic product, consumed for sensory gratification or affective purposes, is more suitable for feminine product presentation compared to a utilitarian product and that perceived credibility is unaffected. Hence, this study finds strong support for that feminine product presentation is suitable for hedonic products than for utilitarian products, where considering the product category is arguably important.

1. Introduction

The supplement industry is big business and belongs to a globally growing market (Grand View Research, 2021). What seems to be the key driver for the growth is increasing consumer awareness towards personal health and wellbeing (Grand View Research, 2021). With the ongoing growth in the supplement industry, the number of products and manufacturers only seem to increase. With many players in the industry, the need to differentiate products from competitors seems to play an important role, which has resulted in an observed trend that marks the base for this study.

Traditional supplement marketing seeks to inform consumers about the scientifically proven benefits that support health and immune system, typically correcting low levels of vitamins that consumers might lack from their diet (Apotek 1, 2023). Hence, traditional supplement marketing puts emphasis on the utilitarian benefits that is the nature of supplements; helpful, practical, functional, and sometimes necessary (Dhar & Wertenbroch, 2000). In recent years, however, we observe an increasing trend where marketing of supplements is centered around hedonic attributes, focusing on the affective aspect of supplements (Woods, 1960) similar to cosmetics. Particularly, we observe an increase in supplements that heavily targets either men or women with their product presentation, focusing on how the supplement can improve a consumer's looks or appearance.

Although marketing and labeling of dietary supplements are limited by regulations that prohibit manufacturers from making claims regarding sickness, symptoms, or pain relief (Lovdata.no, 2004), the regulations hold no other restrictions on the presentation of the product. Additionally, online shopping and foreign market players make the supplement market difficult to control (Matportalen.no, 2013). The observed, hedonic supplement trend seems to utilize this loophole by capitalizing on extremely feminine or masculine product presentation, going into a more controversial direction than traditional product presentation of supplements. The manufacturers present dreamy descriptions about how the consumer's appearance might benefit from purchasing the products. Examples of supplements that can be assigned to this trend are "*Beauty bombs*", "*Orgasm glow*" or "*Skin repair*" (Lyko.com, 2023), (Nytelse.no, 2023), (careandrepair.no, 2023).

These products give the impression that a woman will become prettier and more youthful by consuming the product, only by the product name. We wonder how such hedonic product presentation works for a utilitarian product; does feminine product presentation of supplements work, are the products perceived credible, or do they lead to negative reactions from consumers?

Previous literature relating to the subject is extensive. Some studies are pointing in the direction that feminine product presentation is highly effective, whilst other studies are pointing in the direction that it might not work. On one hand, the observed feminine product descriptions and names serve goals that might be intriguing and desirable for women, such as becoming prettier and more feminine. Within the goal of becoming prettier or more feminine, there will be assumptions that once you accomplish the goal, you will get positive side effects such as increased self-esteem and social acceptance (Bagozzi & Dholakia, 1999). By identifying the consumers' goal, marketers can emphasize these in advertising (Bagozzi & Dholakia, 1999), which is what these supplements seem to do. Van Tilburg, Lieven, Herrmann & Townsend (2015) found that products with strong feminine aesthetic dimensions resulted in positive affective and behavioral consumer responses. Grohmann (2009) found similar results, where feminine and masculine brand personality positively influences attitudinal, behavioral and affective brand-related consumer responses. On one hand, feminine product presentation of supplements might therefore be very effective.

On the other hand, Phillipp-Muller, Costello and Reczek (2023) found results that are pointing in a direction that feminine product presentation of supplements does not work. They pose that once the product is utilitarian, scientific approach works best and vice versa (Phillipp-Muller et al., 2023). It also seems like utilitarian products should emphasize utilitarian benefits (van Osselaer & Janiszewski, 2012). Thus, a highly feminine supplement with hedonic elements might result in negative reactions from consumers, as they appear to be conceptually disfluent (Phillipp-Muller et al., 2023).

Prior research on product presentation has focused almost exclusively on food (Moorman, 2018), (Balasubramanian & Cole, 2018), (Hagen, 2020), aesthetics (van Tilburg et al., 2015) or brand-gender personality (Grohmann, 2009). Moreover, prior research on strongly feminine products has not considered the role of product category (van Tilburg et al., 2015). It is therefore unclear whether the findings from

prior studies generalize to supplements. This is an especially important issue because the supplement industry is growing continuously and often contains misleading marketing (Matportalen.no, 2013). This research is also helpful for marketers and new product developers of supplements, to avoid marketing mistakes that might backfire and result in negative outcomes. This paper investigates how feminine product presentation of supplements is perceived by consumers. Specifically, how feminine product presentations of supplements affect purchase intention and attitude toward product, both alone and through Source Credibility theory. Additionally, we investigate the role of product category on feminine product presentation to identify if the effect of a feminine product presentation depends on the product category.

The research question is formulated as following:

Can feminine product presentation backfire? The role of harmony between product presentation and product category, and the mediating effect of Source Credibility.

2. Theoretical background and research model

2.1 Literature review

2.1.1 The role of product category

Previous literature has found that consumers make trade-offs when they choose between utilitarian and hedonic products (Kivetz & Simonson, 2002), and that consumption takes place for either utilitarian or hedonic reasons (Hirschman & Holbrook, 1982). Hedonic products are primarily consumed for sensory gratification and affective purposes (Woods, 1960), or for fun and enjoyment (Havlena & Holbrook, 1986). As hedonic products focus on positive sensory and affective experiences, consumers tend to associate hedonic products, brands, and attributes with higher levels of warmth relative to utilitarian products (Phillipp-Muller et al., 2023). Utilitarian products, brands, and attributes, on the other hand, are associated with higher levels of competence, and provide instrumental, functional, or practical benefits that are supposed to fulfil a particular function (Phillipp-Muller et al., 2023).

The compatibility principle suggests that arguments should emphasize the benefits that match the consumer's consumption goals to be persuasive (Chernev, 2004). In previous research, this condition is defined as consumption goal-match, where firms emphasize utilitarian benefits for utilitarian products, and hedonic benefits for hedonic products (Klein & Melnyk, 2014). In other words, communicated arguments about the product such as advertising and packaging, and the product category itself should be associated with the same goal (Klein & Melnyk, 2014). For a hedonic product, it is therefore conceptually fluent to emphasize warmth, positive feelings and sensory gratification (Phillipp-Muller et al., 2023). For a utilitarian product, emphasizing hedonic attributes will likely be perceived conceptually disfluent for consumers (Phillipp-Muller et al., 2023).

Applying a goal-oriented perspective can be useful when focusing on whether the consumer is pursuing utilitarian or hedonic goals, and whether the product should emphasize utilitarian or hedonic attributes (Batra & Ahtola, 1991). The expected benefits from a product function as a consumption goal, where the goal is either hedonic or utilitarian (van Osselaer & Janiszewski, 2012).

The product benefits should be emphasized in the presentation of the product to meet the consumer goal (van Osselaer & Janiszewski, 2012). When marketers use arguments to persuade consumers into purchasing their products, it is important to know that consumers process information differently, depending on whether the product is considered hedonic or utilitarian. When the product is utilitarian, consumers engage in more extensive cognitive information processing (Klein & Melnyk, 2014). For a hedonic product, a more affective processing approach is being used (Klein & Melnyk, 2014). Consequently, one should consider different approaches when developing arguments considering the product category.

Previous research argues that increased subjective well-being (SWB) is a common incentive for hedonic consumption (Scitovsky, 1976). SWB is defined as how much a person experiences positive affect compared to negative affect given a particular period in life (Bradburn, 1969). Research identifies that hedonic product usage appears to be positively associated with consumers' well-being (Scitovsky, 1976). We therefore assume that consumers purchase hedonic products to support their subjective well-being, not because they depend on the product to fulfill a need.

For utilitarian products, on the other hand, consumers are more invested and interested in making sure that the product possesses the specific characteristics needed to accommodate this need, using extensive cognitive information processing (Klein & Melnyk, 2014). As a result, consumers find it more difficult to justify hedonic over utilitarian consumption due to the inherent disadvantages of hedonic luxuries compared with utilitarian necessities (Kivetz & Zheng, 2009). Promotion effectiveness is therefore higher for hedonic than utilitarian products, due to consumers need for external justifications when purchasing a hedonic product (Kivetz & Zheng, 2009).

Supplements

When researching the supplement industry, a clear frame of which products underlie the supplement-category must be established. In the Norwegian Regulation of dietary supplements, the definition is: “nutrients that (a) are intended to supplement the diet, and (b) are concentrated sources of vitamins and minerals or other substances with nutritional or physiological effect, alone or combined, and (c) is distributed in prepacked and dosed formats intended to be consumed in small, calculated amounts: as for instance capsules, tablets, pills, powdered bags, ampules,

dropper bottles and similar types of fluids and powders” (Lovdata.no, 2004). According to the Regulations of dietary supplements (Lovdata.no, 2004), the purpose of supplements is utilitarian, meaning that supplements are supposed to be functional, necessary, practical, and helpful (Dhar & Wertenbroch, 2000). It is therefore nearby to claim that supplements in fact are utilitarian.

The observed, hedonic supplement trend does not emphasize these functional, necessary, practical, and helpful benefits. As traditional supplement products apply a more scientific, cold perspective (Phillipp-Muller et al., 2023), new supplement products rather communicate hedonic benefits such as becoming more beautiful and youthful. It may seem like new supplement brands are trying to adjust consumers perception of supplements when using symbolic attributes like cosmetics (Grohmann, 2009).

Although many acts of consumption are driven by a combination of utilitarian and hedonic motives (Alba & Williams, 2013), utilitarian motives seem to play the largest role for consumption of supplements, as supplements fulfil a specific need (Lovdata.no, 2004), and involve a certain risk. Thus, consumers are likely to seek more information before purchasing a supplement (Klein & Melnyk, 2014), and hedonic product presentation might disrupt the information-seeking process as it prohibits consumption goal-matching (Klein & Melnyk, 2014).

Cosmetics

Contrary to supplements, cosmetics are arguably hedonic, as it is defined as anything believed to improve appearance (Haneke, 2003), and have symbolic characteristics (Grohmann, 2009). A broader definition of cosmetology comprises all branches of medicine, pharmacy and chemistry that are involved in making a person more beautiful (Haneke, 2003). Although one could argue that cosmetics at times serve utilitarian needs, consumption of cosmetics rarely provide instrumental, functional, necessary or practical benefits (Phillipp-Muller et al., 2023).

As cosmetics involve products provided to make a person more beautiful, it is reasonable to argue that this places cosmetics as hedonic as it involves positive sensory and affective experiences with higher levels of warmth than utilitarian products (Phillip-Muller et al., 2023). Cosmetics were first commercialized in the eighteenth century but have been perceived a luxury only to be used sparingly since

the sixteenth century by the elite and upper class (Martin, 2009, p. 13). As cosmetics are perceived a luxury, consumption is harder to justify compared with utilitarian necessities (Kivetz & Zheng, 2009).

2.1.2 Feminine product presentation

Previous literature finds that appearance seems to be a likely indicator of product gender (Buss, 2016). Physical characteristics infer masculinity/femininity and attractiveness, and these principles of mate selection influence human information processing and are deeply ingrained in the human brain (Buss, 2016). The overall visual conception of a product is created through different qualities (Bloch, 1995), such as shape, scale, proportion, material, color, reflectiveness, and ornamentation (Davism 1987, van Tilburg et al., 2015). Based on this, feminine product presentation therefore uses feminine cues, such as airy, delicate, round and smooth brand logos, as well as round product forms and lines (van Tilburg et al., 2015). As many supplement brands now use these cues in their product presentation, also this market aims to indicate gender in their products.

When designers shape a product, the product is encoded with information that consumers must decode through evaluation and use (Crilly et al., 2004). It is a common communication tool to encode products with gender-like qualities in the design process (van den Hende & Mugge, 2014). Thus, the design of a product can evoke a sense of gender through specific design cues that are traditionally and culturally bound, where the advertising would be tailored to appeal to stereotypical men and women (Alreck et al., 1982). These gender design codes are often part of the augmented product such as branding and packaging and is part of a sex-based market strategy premised on a correlation between gender identity and product preference, drawing on the possession-self link (Belk, 1988). Thus, implying gender in supplements could lead to product preference for female consumers.

Grohmann (2009) argues the effectiveness of expressing gender in products, as brand personality turned out to positively influence affective, attitudinal, and behavioral brand-related consumer responses. The study found that products with feminine or masculine brand personality was used as a way to express own masculinity or femininity through brand-choice and consumption (Grohmann, 2009). Berger & Heath (2007) explains that identity-relevant products can be viewed as identity-signals that communicate an identity to the consumer and to a

broader audience. Modern women, for instance, are more interested than traditional women to look attractive to males and to look different from others (Reynolds et al., 2018). Modern women are also more likely to identify with a youthful lifestyle (Reynolds et al., 2018). In this sense, the feminine product presentation of supplements might attract modern women because they identify with the modern women's values; become more attractive and youthful with descriptions that amplify their impression that the product suits their feminine identity.

Other studies also support that individuals respond to stimuli that reflect their gender identity (Feiereisen et al., 2009), (Hogg & Garrow, 2003) and (Worth et al., 1992). Gender identity refers to “an individual's self-perceived endorsement of stereotypically masculine or feminine traits” (Palan et al., 2011). Several studies argue that individuals respond to stimuli that reflect an identity tied to their biological sex (Alreck et al., 1982), (Fugate & Phillips, 2010), (Meyers-Levy, 1988), (van den Hende & Mugge, 2014). According to this research, it is fair to assume that women will respond to stimuli that reflects femininity, as this is their biological sex. The extent to which degree this will be the case, might be affected by how feminine a consumer identifies as.

Not all previous research indicates that using feminine product presentation will benefit the brand. Evidence in the literature also provides support for how feminine product presentation of a supplement product might result in negative consumer responses. Phillipp-Muller et al. (2023) found that invoking scientific language on consumer products works best when the product is positioned as utilitarian, as the perceived competence of the scientific process is more compatible with the competence associated with utilitarian products. Respectively, scientific language backfires when the product is positioned as hedonic (Phillipp-Muller et al., 2023). Because supplements are utilitarian, scientific language might be a better fit in the presentation of a supplement product, as communicating competence seems to be critical for utilitarian products (Phillipp-Muller et al., 2023).

The extensive feminine product presentation observed for certain supplements has hedonic elements within the product presentation, respectively. According to Phillipp-Muller et al. (2023), a supplement with hedonic, feminine product presentation is considered conceptually disfluent. As conceptual fluency increases product evaluation, conceptual disfluency reduces product evaluation, respectively (Lee & Labroo, 2004). It is therefore reasonable to believe that feminine product

presentation of supplements will reduce product evaluations – opposite of what the marketers and new product developers of supplements aim for. Contrary, feminine product presentation of a hedonic product, such as cosmetics, might increase product evaluation. The research by Phillip-Muller et al. (2023) supports that for a hedonic product, such as cosmetics, *non-scientific*, warm language is more suitable and more conceptually fluent.

2.1.3 Purchase intention

According to Phillip-Muller et al. (2023), a supplement with hedonic, feminine product presentation is conceptually disfluent and will lead to reduced product evaluation, respectively. However, we experience an increase in feminine product presentation of supplements, but lack of existing research on its effects, incentivizes us to investigate further how feminine product presentation affect purchase intention. Purchase intention is defined as the anticipated or planned future behavior of individuals and is the probability that beliefs and attitudes can be moved to act (Engel & Blackwell, 1982). Choung (2020) defines purchase intention as “the likelihood that a customer will engage in a given purchase activity”. Furthermore, Maxham & Netemeyer (2002) define purchase intention as “a measure of how likely customers are to buy a company’s service or product in the future”.

We are interested in purchase intention as phenomenon, as purchase intention is a proven predictor of purchase behavior, because it indicates the motivating goal of acquiring a thing (Shin & Hancer, 2016). Additionally, Tauber (1973) found that respondents who express positive purchase intention do not necessarily believe that the product solves a problem or meets an unmet need, many are just curious to try or enjoy trying new things. Hence, a positive purchase intention might indicate that people are curious about trying, but with little expectation of adopting (Tauber, 1973). However, whether the consumption goal is to fulfil a need or to try a new product, it incentivizes purchasing behavior either way.

Previous research has found an incentive for purchase that can draw a link to cosmetics, or hedonic products. People desire certain products because they want to have the experiences that comes with purchasing these goods (Wu & Lee, 2016). Cosmetics differ from other retail goods as the “consumption situation must influence consumers’ impulse buying behavior through experiential marketing” (Wu & Lee, 2016). Norman (2004) states that consumers’ purchasing behavior is

usually influenced by human instinct and is the first impression upon the feelings after an external stimulus, such as environmental contact and a trace of interpersonal interaction. These arguments indicate that increased external stimulus for cosmetics may positively affect purchase intention by triggering impulsive buying behavior (Wu & Lee, 2016). It is further not unlikely that purchase intention for other hedonic products also depends on creating a purchase experience characterized by impulse buying behavior in a similar way to that of cosmetics. Hence, the use of triggering cues in cosmetic products will likely stimulate the consumer and partake in the total purchase experience.

Consumption characterized by utilitarian motives, such as a supplement, might be explained by Kozup et al. (2018). The study found that when favorable nutritional claims within food were presented on the product packaging, it positively affected purchase intentions. Nutritional information is scientific and therefore a typically utilitarian benefit that applies to extensive cognitive information processing (Klein & Melnyk, 2014). Hence, one can assume that people who purchase supplements are positively affected by typical utilitarian benefits rather than hedonic benefits.

2.1.4 Attitude toward product

An attitude can be defined as “a summary of evaluation of an object of thought” (Bohner & Wänke, 2009, p. 5). Previous research has shown that attitude is a direct determinant of purchase intention (Grewal, Stephen and Coleman, 2019), (Bagozzi & Dholakia, 1999). Hence, this study will also measure attitude to obtain the nuances of purchase intention. Attitude is modeled as a function of specific beliefs and other reactions to product/service attributes or consequences of purchase (Bagozzi & Dholakia, 1999). As attitude is a direct determinant of purchase intention (Bagozzi & Dholakia, 1999), it is conceptualized that attitude toward product and purchase intention will follow the same path in relation to feminine product stimuli. Hence, if attitude toward product is negative, purchase intention will likely be negative.

Social psychologists have suggested different classes of psychological needs or goals which may be served by holding attitudes (Bohner & Wänke, 2009, p. 6). Researchers looked at functions relevant in consumer behavior and distinguished product attitudes based on image concerns, which serve the function of presenting oneself favorably, and those based on product quality concerns, which serve the

function of evaluating the utilitarian aspects of the product (Shavitt, 1990). According to this research, image concerns would relate to hedonic product categories, as presenting oneself favorably is considered an affective purpose (Phillipp-Muller et al., 2023). Product quality concerns would relate to utilitarian product categories, as utilitarian products provide instrumental, functional, or practical benefits that are supposed to fulfil a particular function (Phillipp-Muller et al., 2023), and product quality therefore determines to which extent the product succeeds in providing these benefits. Hence, we assume that increased perception of product image will lead to higher attitude toward product when the product is hedonic. On the contrary, we assume that increased perception of competence will lead to higher attitude toward product when the product is utilitarian.

Drawing from the literature, we conceptualize that a feminine product description and name, referred to as the *product presentation*, will have different outcomes on purchase intention and attitude toward product depending on whether the product is utilitarian or hedonic. The following hypothesis are presented:

H₁: For products where scientific competence is important, increased use of feminine cues will reduce purchase intention and attitude toward product.

H₂: For products used for sensory gratification and affective purposes, increased use of feminine cues will increase purchase intention and attitude toward product.

2.1.5 Source Credibility

Two different product categories are defined, *supplements* and *cosmetics*, which are represented by utilitarian or hedonic characteristics, respectively. We propose that a feminine product presentation is more conceptually fluent for hedonic products than for utilitarian products. A possible explanation is the way feminine product presentation influences perceived *Source Credibility* in the eyes of the consumers.

Source Credibility Theory can explain why some brands or products are judged more credible than others (Lowry, Wilson & Haig, 2013). Source Credibility Theory is a well-established theory that was fully conceptualized by Berlo, Lemert & Mertz (1969), which explains how the persuasiveness of a communication is determined by the perceived credibility of the source communication (Lowry et al., 2013). The theory is mostly applied to verbal or written communication (Lowry et al., 2013). We will further focus on *surface credibility* posed by (Fogg & Tseng,

1999), that have identified four types of Source Credibility. Surface credibility “describes how much a perceiver believes someone or something based on simple inspection” (Fogg & Tseng, 1999). A product may appear credible or not only based on a simple product description, and the credibility is derived from the initial impression of a product (Fogg & Tseng, 1999). Surface credibility in our case refers to the short product description and the product name, which we have chosen to label as the *product presentation*. We will use the term credibility further when discussing surface credibility.

A product is often the first interaction a customer has with a firm, for example when shopping online or offline, or through online or offline advertising for a brand’s product (Lowry et al., 2013). Most supplements with feminine product presentation that we have observed are found through online channels. As consumers tend to make a decision within the first seconds of a brand interaction, the first impression plays an important role of a product's success (Lowry et al., 2013). Knowing that consumers engage in more extensive cognitive information processing when searching for a utilitarian product (Klein & Melnyk, 2014), consumers expect to find necessary information regarding the specifics of the product.

As a lot of necessary information on supplements has been traded for triggering, hedonic cues, one could argue that there is a gap between what a consumer expects to find and what they experience finding in the presentation of the product when a supplement is highly feminine. Because traditional supplements have been presented neutrally with pure informative benefits on the packaging, lack of this information on feminine supplement packaging may influence consumers to believe that lack of information is congruent with lack of competence.

There are two main dimensions that make up Source Credibility, based on the Source Credibility Theory: *trustworthiness* and *expertise* (Lowry et al., 2013). *Trustworthiness* is referred to as “the perceived integrity or decency of the source” (Lowry et al., 2013), and is found to be the most influential dimension for consumers in determining Source Credibility (Berlo et al., 1969). *Expertise* refers to how the receiver judges the source in accordance to being “trained, experienced, authoritative, skilled and informed” (Berlo et al., 1969).

Traditional supplements communicate science and utilitarian benefits within the product presentation, such as scientifically proven results and the dosage level

(Apotek 1, 2023). Such product presentation for a supplement evokes a sense of trustworthiness, believability and expertise, which is highly important when judging credibility (Lowry et al., 2013). Contrary, feminine supplements communicate hedonic descriptions about how the product can make the consumer prettier and more youthful, are often candy-like such as gummy bears, and have feminine flavors such as vanilla or berries (Lyko, 2023). These product presentations might not evoke a sense of expertise, trustworthiness or believability, rather incompetency or fabrication. Trustworthiness, expertise and believability arguably plays an especially important role for supplements, as they come with a certain risk and belong to a product category associated with competence (Phillip-Muller et al., 2022). According to the Source Credibility Theory, a feminine product presentation of a supplement might dilute the perceived credibility due to lack of trustworthiness, believability and expertise, which in turn could affect purchase intention and attitude toward the product in a negative direction.

For cosmetics, however, a feminine product presentation might not have the same implications for credibility compared with supplements, due to being hedonic. As previously discussed, hedonic product presentation for hedonic products, such as cosmetics, is conceptually fluent (Phillipp-Muller et al., 2023). Additionally, the need for expertise and extensive information processing is arguably lower for cosmetics as the risks associated with consumption are considerably lower for this product category than for supplements.

The conceptualization is that a utilitarian supplement faces greater challenges in terms of perceived credibility when using feminine product presentations, whereas for a hedonic product, credibility might not be affected when using feminine product presentation. The hypothesis are therefore presented as the following:

H₃: For products where scientific competence is important, increased use of feminine cues will reduce the perceived credibility, which in turn will lead to reduced purchase intention and attitude.

H_{3a}: For products used for sensory gratification and affective purposes, increased use of feminine cues will not reduce the perceived credibility.

H₄: The effect of feminine product presentation depends on the product category. Product category has a moderating role on feminine product presentation.

2.2 Literature overview

The following table contains an overview of the research discussed in section 2.1 and an overview of the hypothesis derived from the literature.

Dimensions	Previous studies		Current study
<i>Feminine product presentation</i>	Literature supporting a positive effect of presenting a product as feminine:		As it seems like feminine product presentation can be positive or negative for a brand, this study conceptualize that it depends on whether the product is utilitarian or hedonic. When the product category is utilitarian, it seems like feminine product presentation can backfire. However, it might be the case that a hedonic product with feminine product presentation can experience a positive effect. As we have observed a trend of presenting supplements as feminine, the utilitarian product is a supplement, and the hedonic product is a cosmetic product. H1: For products where scientific competence is important, increased use of feminine ques will reduce purchase intention and attitude toward the product H2: For products used for sensory gratification and affective purposes, increased use of feminine ques will increase purchase intention and attitude toward product
	Grohmann (2009)	Expressing feminine or masculine personality in brands positively influence affective, attitudinal, and behavioral brand-related consumer responses	
	Berger & Heath (2007)	Identity-relevant products can be viewed as identity-signals that communicate an identity to the consumer and to a broader audience	
	Literature supporting a negative effect of presenting products as feminine:		
	Klein & Melnyk (2014)	Consumption goal-match suggests that firms should emphasize utilitarian benefits for utilitarian products, and hedonic benefits for hedonic products	
	Phillipp-Muller, Costello & Reczek (2023)	Presenting a hedonic product with scientific language backfires as scientific language is associated with coldness and competence, and hedonic products are associated with higher levels of warmth. This is referred to as conceptual disfluency.	

Source Credibility	Klein & Melnyk, (2016)	Consumers engage in more extensive cognitive information processing when searching for a utilitarian product. For a hedonic product, a more affective processing approach is being used.	Knowing that consumers engage in extensive cognitive information processing for utilitarian products, we conceptualize that feminine product presentation of a utilitarian product will reduce the perceived credibility of that product as it does not satisfy the cognitive information processing system. Contrary, as consumers use an affective processing approach for hedonic products, we conceptualize that a cosmetic product with feminine product presentation will not reduce the perceived credibility
	Lowry, Wilson & Haig (2013)	Source Credibility Theory can explain why some brands or products are judged more credible than others, where <i>trustworthiness</i> and <i>expertise</i> is the most important factors when judging credibility. As consumers tend to decide within the first seconds of a brand interaction, the first impression plays an important role of a product's success	H₃ : For products where scientific competence is important, increased use of feminine cues will reduce the perceived credibility, which in turn will lead to reduced purchase intention and attitude
	Fogg & Tseng (1999)	Surface credibility: A product may appear credible or not only based on a simple product description, and the credibility is derived from the initial impression of a product	H_{3a} : For products used for sensory gratification and affective purposes, increased use of feminine cues will not reduce the perceived credibility H₄ : The effect of feminine product presentation depends on the product category. Product category has a moderating role on feminine product presentation

Table 1: literature overview

2.3 Conceptual research model

Based on our hypotheses we have developed a research model that presents a main effect, where attitude toward product and purchase intention is determined by feminine stimuli on two different product categories. The research model also addresses a mediating effect of Source Credibility, the indirect effect. Lastly, the model examines if product category has a moderating effect on feminine stimuli, where an effect of feminine stimuli might depend on the product category.

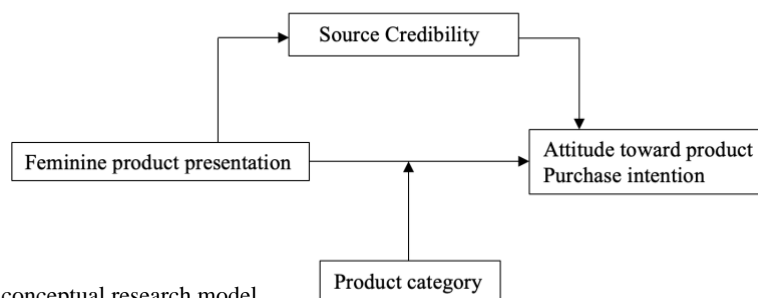


Figure 1: conceptual research model

3. Methodology

This study aims to measure the impact of feminine product presentation on purchase intention and attitude toward product, by two different product categories. This experimental study consists of a 2x2 Factorial Design (Malhotra, 2019, p. 253), where test units are randomly assigned to one of four cells for online experiments with between-subjects design:

Table 2: 2x2 factorial design

Product category	Level of femininity	
	Low	High
Supplements	A	B
Cosmetics	C	D

A Factorial Design allows for interactions between variables, and an interaction can occur when the simultaneous effect of two or more variables is different from the sum of their separate effects (Malhotra, 2019, p. 253). The main effect and interaction effect is symbolized as following:

Main effect:

$$\beta_0 + \beta_1 * \text{femininity}$$

Interaction effect:

$$\beta_0 + \beta_1 * \text{femininity} + \beta_2 * \text{product category} + \beta_3 * \text{femininity} * \text{product category}$$

$$\frac{d(\text{purchase intention, attitude toward product})}{d(\text{femininity})} = \beta_1 + \beta_3 * \text{product category}$$

An interaction effect in this case occurs when the influence of feminine stimuli on purchase intention or attitude depends on the product category.

Randomization controls for selection bias and extraneous variables (Malhotra, 2019, p. 243). Mortality was controlled for through forced response in the online experiments (Malhotra, 2019, p. 248), and to obtain the highest possible reliability of the results (Kwak & Kim, 2017). We made all the product names and descriptions artificial in the four conditions to reduce respondent familiarity (Lowry et al., 2013), but with inspiration from real product names and descriptions on the market.

Internal consistency reliability was controlled for through Cronbach's alpha, with 0.7 or above as the main rule for high internal consistency reliability (DeVellis, 2012). The external validity was strengthened due to a large sample size of female participants (N = 244) (Malhotra, 2019). However, the subjects were somehow similar in terms of education level, causing a threat to the external validity. However, repeated experiments tend to produce the same results when subjects are similar, leading to high internal validity (Malhotra, 2019). Content validity (Malhotra, 2019) was maintained by examining and using existing scales from highly ranked journals, as well as conducting a preliminary test to observe how the scales worked.

A preliminary test was conducted including all 2x2 conditions, with posttreatment measures and manipulation check. The manipulation check asked participants to

rate their perceived femininity of the product presentation on a 7-point scale, reaching from 1 = not at all feminine, 4 = neutral, to 7 = very feminine (van Tilburg et al., 2015), *see appendix 1*. Lastly, participants were asked about their purchase intention and attitude toward product on 7-point scales (Kozup et al., 2003), *see appendix 1*. The purpose of the preliminary test was to establish that the test units who received high stimuli indeed perceived the product significantly more feminine than the test units who received low stimuli. Additionally, the preliminary test was included to establish content validity (Malhotra, 2019). Lastly, we wanted to observe if the test results from the posttreatment measures were congruent with hypothesis 1 and 2 to continue with the main study.

The main study randomly assigned test-units to one of the 2x2 conditions with the same posttreatment measures as the preliminary test, measuring purchase intention and attitude toward product (Kozup et al., 2003). Additionally, a third variable was included, Source Credibility, consisting of 4 items to measure *expertise*, and 5 items to measure *trustworthiness* with 7-point scales (Lowry et al., 2013), *see appendix 1*. The manipulation check of perceived femininity was removed. The purpose of the main study was to observe if test results were congruent with hypothesis 1 and 2 and the preliminary test, investigate whether Source Credibility had a mediating effect for hypothesis 3 and 3a, and if product category had a moderating effect on feminine stimuli for hypothesis 4.

3.1 Preliminary test

A preliminary test (N = 125) was conducted using a convenience sample including only female friends and relatives through Facebook. We randomly assigned test units to one of the four scenarios for an online experiment. Following hypothesis 1, we conceptualize that for products where scientific competence is important, increased use of feminine cues will reduce purchase intention and attitude toward the product. Contrary, we conceptualize that for products used for sensory gratification and affective purposes, increased use of feminine cues will increase purchase intention and attitude toward product for hypothesis 2.

For the two scenarios where the product category was supplements, we chose to base the artificial products of a zinc product. Zinc is known to be beneficial for hair and nails, and therefore frequently wrapped into a trendy and feminine product presentation. However, zinc has traditionally been presented as a supplement that

helps to maintain normal bone structure and immune system, with an additional benefit of strengthening hair and nails. We therefore tried to replicate a traditional zinc product that provided scientific and functional benefits for the low-stimuli group, and a feminine zinc product that more extensively highlighted the feminine aspect of zinc for the high-stimuli group.

For the two scenarios where the product category was cosmetics, we chose to base the artificial products of a body cream for several reasons. Firstly, we believe that body cream is a more frequently used cosmetic product across genders than for example lipstick. Even though we only include women in this study, we would be afraid that a lipstick in the low stimuli scenario would be perceived feminine, simply because lipstick is a feminine product. It therefore seemed more reasonable to choose a body cream instead of for example lipstick to avoid product gender-perceptions (Grohmann, 2009) that could bias the manipulation check.

The four scenarios were presented as the following:

Table 3: scenarios

Supplements		Cosmetics	
<i>High stimuli</i>	<i>Low stimuli</i>	<i>High stimuli</i>	<i>Low stimuli</i>
<i>Sugarlust beauty bears</i> <i>- Hair, skin, and nails vegan gummies-</i>	<i>Pharma+</i> <i>-Zinc 25 mg-</i>	<i>Strawberry and rose silk cream</i> <i>-Soft and refreshing body cream-</i>	<i>Moisture 24</i> <i>-Rich and effective moisturizer-</i>
A glorious appearance is formed from within the body! These sweet, vegan gummy bears are made up of a delightful blend of vitamins and minerals, specially designed for women and their unique needs. Strengthens and maintains skin, hair and nails. Taste of vanilla and goji berries.	Zinc helps to maintain normal function of the immune system, cognitive function, and normal reproductive capacity. In addition, zinc contributes to the maintenance of normal vision, skin, hair, bones, and nails, as well as wound healing. Does not contain animal ingredients or gluten.	A delicious, fragrant moisturizer with the smell of strawberry and rose. Rose extract helps to keep the skin healthy and at the same time gives a delicate and sensual scent.	A scent free moisturizer that can be used on all skin types. The cream keeps the skin moist for over 24 hours. Does not contain parabens, perfume or alcohol.

3.1.1 Preparation and assumption testing

For the dataset obtained in the preliminary test, we decided to conduct a variety of statistical analyses, in particular one-way analysis of variance (ANOVA), Principal Component Analysis and one-way multivariate analysis of variance (MANOVA). To perform these analyses, preparation and assumption testing needed to be performed to ensure appropriateness of each specific analysis.

A test for multivariate and univariate outliers was conducted as many analyses are sensitive to extreme scores (Pallant, 2016, p. 289). A univariate normality test revealed no test unit outside normal distribution of z-scores above 3.29 or -3.29 (Mowbray, Fox-Wasylyshyn & El-Masri, 2019, p. 34). A linear regression with Mahalanobis distance revealed a few outliers that were removed, as their Mahalanobis value exceeded the critical value of 13.82 for two dependent variables (Pallant, 2016, p. 313, 314).

After outlier removal, the number of respondents (N = 117) were distributed as the following:

Table 4: sample size preliminary test

Low stimuli, <i>supplements</i>	N = 32
Low stimuli, <i>cosmetics</i>	N = 31
High stimuli, <i>supplements</i>	N = 28
High stimuli, <i>cosmetics</i>	N = 26

The dataset meets the assumptions of level of measurement as we have continuous scale on all the items in the dependent variables (Pallant, 2016, p. 226). We also have independence of all observations (Pallant, 2016, p. 226). Normal distribution is violated but does not cause too many problems with large enough sample size > 30 (Pallant, 2016, p. 227). The assumption of random sampling is not met as we used convenience sampling (Pallant, 2016, p. 226). Levene's Test of Equality of Error Variance is examined after we fit the model, and should be non-significant (Pallant, 2016, p. 227, 228).

3.1.2 One-way ANOVA

A one-way analysis of variance with one independent variable was conducted to compare the mean difference between the test units who received low level of feminine stimuli = 0 and high level of feminine stimuli = 1 (Pallant, 2016, p. 274). The dependent variable was perceived femininity, measured on a 7-point scale.

Levene's test was significant, sig. < 0.001, indicating that the assumption of equal error variance was violated. The results showed a significant difference between the two groups on perceived femininity, $F(1) = 199.536$, $p < 0.001$, $\eta^2 = 0.634$. Hence, the manipulation check identified significant difference of perceived femininity among the groups who received low level of femininity and high level of femininity. Descriptive statistics revealed that the high-stimuli group who received a supplement ($N = 28$) perceived the zinc supplement as very feminine ($M = 6.25$), whilst the low-stimuli group who received a supplement ($N = 32$) perceived the zinc supplement as neutral ($M = 4.16$).

For cosmetics, the high-stimuli group ($N = 26$) perceived the body cream as very feminine ($M = 6.35$), whilst the low-stimuli group ($N = 31$) perceived the body cream as slightly unfeminine ($M = 3.06$).

3.1.3 Principal Component Analysis

We subjected the dependent variables *purchase intention* and *attitude toward product* into two separate principal component analyses (PCA) to obtain two constructs, as both dependent variables were measured by 3 items. Principal component analysis finds the minimum number of factors which represent the maximum variation in the original data and is therefore highly appropriate when the goal is data reduction (Fabrigar et al., 1999, p. 226).

There are additional assumptions that ideally should be met before conducting PCA. Each subject in the dataset must provide a score on both variable X and variable Y (Pallant, 2016, p. 147). This assumption is met. A matrix scatter plot for the two constructs and the independent variables *product category* and *stimuli* showed a linear relationship, indicating the assumption of linearity was met, (Pallant, 2016, p. 148), *see appendix 2*. Ideally, sample size $N > 150$. After removal of outliers, $N = 117$. Thus, this assumption is not met.

When examining if PCA is appropriate, KMO must be > 0.6 , Bartlett's Test should be $p = \leq 0.05$ and the Correlation Matrix must show few or no values below 0.3 (Pallant, 2016, p. 208). When determining how many components to extract, we are only interested in components that have an eigenvalue of 1 or more, using Kaiser's Criterion (Pallant, 2016, p. 213). To examine this, we look at the Total Variance Explained table (Pallant, 2016, p. 213). To determine the number of components to extract, the Scree plot should also be examined, where only components above the elbow, a change in the shape of the plot, are retained (Pallant, 2016, p. 213). To ensure an extraction of the right number of components, we looked at the Component Matrix which shows the unrotated loadings of each of the items on the component(s) (Pallant, 2016, s. 214).

Principal Component Analysis 1: Purchase intention

All values in the correlation matrix were above 0.3 (Pallant, 2016, p. 208). Kaiser-Meyer-Olkin-Measure of Sampling Adequacy = 0.7, Bartlett's Test = < 0.001 . PCA is therefore appropriate.

The results clearly suggested a one-factor solution, which was supported by the initial Eigenvalue of 2.530 for component 1. One component of purchase intention counted for 84.32% of the Total Variance Explained, and the Scree plot suggested only 1 component. The Component Matrix suggested 1 component that showed high loadings above 0.8 for all 3 items of purchase intention: 0.866, 0.944, 0.942. Cronbach's alpha = 0.9, indicating high internal consistency reliability of the scale (Pallant, 2016, p. 116).

Principal Component Analysis 2: Attitude toward product

All values in the correlation matrix were above 0.3 (Pallant, 2016, p. 208). Kaiser-Meyer-Olkin-Measure of Sampling Adequacy = 0.77, Bartlett's Test = < 0.001 .

A one-factor solution was also suggested for the construct of attitude toward product. This was supported by the Eigenvalues that showed an Eigenvalue of 2.794 for component 1. One component of Attitude toward product counted for 93% of the Total Variance Explained, and the Scree plot suggested only 1 component. The Component Matrix showed high factor loadings above 0.9 for all 3 items on one component: 0.966, 0.959, 0.97. Cronbach's alpha = 0.96.

Hence, principal component analysis for all items of the dependent variables were appropriate, resulting in two clear constructs. We used the new factor scores of the dependent variables from the principal component analysis for further multivariate analysis of variance.

3.1.4 MANOVA

Some additional assumptions should be examined before conducting multivariate analysis of variance. As MANOVA works best when the dependent variables are moderately correlated, we ran a bivariate correlation analysis to check for multicollinearity that showed correlations of 0.8 between the two dependent variables (Pallant, 2016, p. 315). Homogeneity of variance-covariance matrices was examined after fitting the model from the Box's Test of Equality of Covariance Matrices, where a significance value of < 0.001 means violation. The Levene's test of equal error variance was also examined after fitting the model, where significance value of ≤ 0.05 means violation (Pallant, 2016, p. 318).

A one-way between-groups multivariate analysis of variance was performed to investigate differences between high- and low stimuli on purchase intention and attitude toward product, in line with hypothesis 1 and 2. Two dependent variables were used: attitude toward product and purchase intention, as attitude is proven to be a direct determinant of purchase intention (Bagozzi & Dholakia, 1999). The independent variable was level of stimuli (1 = high stimuli, 0 = low stimuli), and the MANOVA was conducted on a split file based of product category to obtain a separate multivariate analysis of variance for each product category to test hypothesis 1 and 2.

Supplements

For the two scenarios containing a supplement, the MANOVA showed no violation of the homogeneity of variance-covariance assumption, Box's test of Equality of Covariance Matrices, sig. = 0.486. Levene's test showed no violation of the assumption of equal error variance, as none of the dependent variables were ≤ 0.05 .

The MANOVA results revealed statistically significant difference between the two groups who received a supplement (high / low stimuli) on the combined dependent

variables where H_0 is rejected if $p \leq 0.05$ (Pallant, 2016, p. 320). $F = (2, 364) = 6.03$, $p = 0.004$, Wilk's Lambda = 0.8, $\eta_p^2 = 0.17$.

The results for the dependent variables were thereby viewed separately, with a Bonferroni adjusted alpha level of ≤ 0.025 to reduce type 1 error (Pallant, 2016, p. 320). Both dependent variables were significant between the two groups with an adjusted significance level: purchase intention, $p = 0.002$, attitude toward product, $p = 0.003$. The mean scores showed that the high-stimuli group reported negative purchase intention and attitude compared to the low-stimuli group, as hypothesized:

Table 5: mean scores supplements (high / low)

Supplements		Mean	Lower Bound	Upper Bound
Purchase intention	Low stimuli	0.25	- 0.03	0.5
	High stimuli	- 0.42	- 0.7	- 0.13
Attitude	Low stimuli	0.27	- 0.02	0.56
	High stimuli	- 0.4	- 0.7	- 0.09

The results from the MANOVA are congruent with hypothesis 1 and show that increased use of feminine ques reduces purchase intention and attitude toward product when the product is a supplement where scientific competence is important.

Cosmetics

For the two groups that received a body cream (high / low stimuli), the MANOVA showed violation of the homogeneity of variance-covariance matrices, Box's test of Equality of Covariance Matrices, sig. = < 0.001 . Moreover, Levene's test showed violation of equal error variance, with a significance level of < 0.001 for all dependent variables that should be non-significant to meet the assumption (Pallant, 2016, p. 319).

The results of MANOVA revealed statistically significant difference between the two groups who received a body cream on the combined dependent variables, where

H0 is rejected if $p \leq 0.05$ (Pallant, 2016, p. 320). $F(2, 54) = 16.7$, $p = < 0.001$, Wilk's Lambda = 0.6, $\eta_p^2 = 0.38$. The results for the dependent variables were thereby viewed separately, with a Bonferroni adjusted alpha level of ≤ 0.025 (Pallant, 2016, p. 320). Both dependent variables were significant between the two groups: purchase intention, $p = < 0.001$, attitude toward product, $p = < 0.001$.

An inspection of the mean scores showed that the high-stimuli group consistently reported higher purchase intention and attitude toward product compared to the low-stimuli group, as hypothesized:

Table 6: mean scores cosmetics (high / low)

Cosmetics		Mean	Lower Bound	Upper Bound
Purchase intention	Low stimuli	- 0.56	- 0.9	- 0.22
	High stimuli	0.81	0.45	1.18
Attitude	Low stimuli	- 0.57	- 0.9	- 0.25
	High stimuli	0.78	0.43	1.13

The results are congruent with hypothesis 2. For a hedonic product, such as a cosmetic product, increased use of feminine cues increased purchase intention and attitude toward product. Thus, it seems like the effect of feminine cues on a product description and name depends on whether the product is hedonic or utilitarian, and that a utilitarian product will experience a backfire effect as feminine cues increases.

3.2 Main study

An online experiment (N = 138) was conducted using a QR-code where we asked female students at the university to participate. Test units were randomly assigned to one of the four conditions, for a between-subjects design. Participants were presented with the following cover story before they received one of the four conditions:

“Imagine that you are scrolling through Instagram and an advertisement with the following product is displayed:”

This cover story was selected as it represents a likely scenario of which the product would appear in. It is also a scenario that does not align more with one of the treatment groups than the other. Additionally, the population whom we collected the sample from are likely to be able to relate to the scenario in which the cover story places them in, as Instagram is a frequently used social media among females (Ipsos.com, 2023).

After the treatment, participants were asked about their purchase intention and attitude toward product on 7-point scales (Kozup et al., 2003). This time we included a third, mediating variable, Source Credibility (Lowry et al., 2013).

A mediating variable is conceptualized as the mechanism through which X influences Y, hence, “variations in X causes variation in one or more mediators M, which in turn causes variation of Y” (Hayes, 2013, p. 7).

The purpose of the main study was to re-confirm hypothesis 1 and 2 when the manipulation check was removed, and answer hypothesis 3, 3a and 4. Firstly, in line with hypothesis 3, we conceptualize that for products where scientific competence is important, increased use of feminine cues will reduce the perceived credibility, which in turn will lead to reduced purchase intention and attitude. Following hypothesis 3a, we further conceptualize that for products used primarily for sensory gratification and affective purposes, increased use of feminine cues will not reduce the perceived credibility. Lastly, we investigate whether product category has a moderating effect on feminine product presentation in hypothesis 4. That is, that the effectiveness of feminine stimuli for a product depends on the product category, where hypothesis 4 will include an interaction effect.

3.2.1 Preparation and assumption testing

The same method as in the preliminary test was used to remove outliers, *see section 3.1.1*. The univariate normality test did not identify any outliers. However, a Mahalanobis distances test obtained a maximum value of 41.98, meaning we had multivariate outliers that exceeded the critical value of 16.27 for three dependent variables (Pallant, 2016, p. 294). Several multivariate outliers with the highest Mahalanobis values were removed due to strange or unlikely combination of scores, however, we did keep some multivariate outliers where scores were not too extreme. After outlier removal, the number of respondents in each group were:

Table 7: sample size main study

Control group, <i>supplements</i>	N = 31
Control group, <i>cosmetics</i>	N = 29
Experimental group, <i>supplements</i>	N = 32
Experimental group, <i>cosmetics</i>	N = 35

Preferably, N should be > 30 (Pallant, 2016, p. 319). Therefore, we conclude that a violation of normality may affect the output more than it would if N > 30 in all treatment groups (Pallant, 2016, p. 319). We further have continuous scale on all items in the dependent variables, hence, our dataset meets the assumptions of level of measurement (Pallant, 2016, p. 226). Each of the subjects in the dataset provides a score on both variable X and variable Y (Pallant, 2016, p. 147). We also have independence of all observations (Pallant, 2016, p. 226). A matrix scatter plot for the three constructs and the independent variables stimuli and product category showed a linear relationship in all cases, indicating the assumption of linearity was met (Pallant, 2016, p. 148), *see appendix 2*. The assumption of random sampling was not met as we used convenience sampling (Pallant, 2016, p. 226). Levene's Test of Homogeneity of Variances were reviewed after we fit the model, and should be non-significant (Pallant, 2016, p. 227–228).

3.2.2 Principal component analysis

Principal Component Analysis 1: Purchase intention

All values in the correlation matrix exceeded 0.3, thus, this criterion was met (Pallant, 2016, p. 208). Additionally, the Kaiser-Meyer-Olkin (KMO) value exceeded the critical value of 0.6, KMO = 0.658 (Pallant, 2016, p. 208). Bartlett's test of sphericity was significant, $p = < 0.001$.

The output of PCA clearly suggested a one-factor solution. This was supported by the initial Eigenvalues, with an Eigenvalue of 2.312 for component 1. Component 2 had an Eigenvalue of < 1. 77% of the Total Variance could be explained by component 1, and the Scree plot clearly suggested 1 component. The Component Matrix showed high factor loadings on 1 component: 0.775, 0.928, 0.922.

Principal Component Analysis 2: Attitude toward product

For the second dependent variable *Attitude toward product*, the Correlation Matrix showed that all values exceeded 0.3. KMO = 0.749, Bartlett's test of sphericity was significant, $p = < 0.001$. PCA was therefore appropriate.

A one-factor solution was clearly suggested. The Eigenvalue was 2.653 for component 1, whilst components 2 and 3 had Eigenvalues < 1 . 88.43% of the Total Variance could be explained by component 1, and the Scree plot also suggested 1 component, resulting in a one-factor solution. The Component Matrix showed that all items had high loadings on component 1 that exceeded 0.9: 0.956, 0.945 and 0.920.

Principal Component Analysis 3: Source Credibility

The Correlation Matrix showed that all values exceeded 0.3. KMO = 0.927, Bartlett's test = < 0.001 . A KMO above 0.9 indicates that each variable can be almost perfectly explained from other variables (Malhotra, 2019, p. 610-612).

The output clearly suggested a one-factor solution. Component 1 had an Eigenvalue of 6.482 and explained 72% of the Total Variance. Component 2 – 9 had eigenvalues < 1 . The Scree Plot also suggested one component, with a sharp change in the curve after component 1. The Component Matrix showed high loadings on all items for component 1: 0.855, 0.853, 0.859, 0.858, 0.832, 0.806, 0.800, 0.879 and 0.891.

Conclusively, PCA was appropriate for all item-scales, and a one-factor solution was suggested for all dependent variables. The dimension reduction resulted in three clear components: *Purchase Intention*, *Attitude toward product* and *Source Credibility*. The new factor scores from the principal component analysis were further used for a multivariate analysis of variance. Cronbach's alpha showed high internal consistency reliability of all scales:

Table 8: Cronbach's alpha

Cronbach's alpha, attitude toward product	0.93
Cronbach's alpha, purchase intention	0.84
Cronbach's alpha, source credibility	0.95

3.2.3 MANOVA

A one-way between-groups multivariate analysis of variance was performed to investigate differences between high and low stimuli on purchase intention and attitude toward product. The main purpose was to re-confirm evidence for hypothesis 1 and 2, as well as ensuring the results retrieved from the MANOVA in the preliminary test. The independent variable was level of stimuli (1 = high stimuli, 0 = low stimuli), and the MANOVA was conducted on a split file based of product category (1 = supplement, 0 = cosmetics) to obtain separate multivariate analysis of variance for each of the product categories. A bivariate correlation showed correlations of 0.7 for both dependent variables (Pallant, 2016, p. 315). The main effect from the MANOVA is visualized as the following:

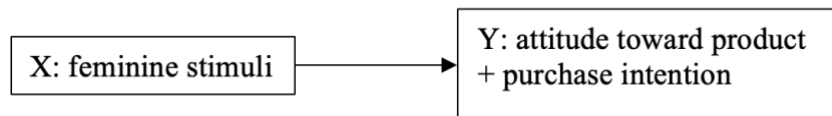


Figure 2: main effect

Supplements

For the two scenarios containing a supplement, the MANOVA showed no violation of the homogeneity of variance-covariance assumption, Box's test of Equality of Covariance Matrices, sig. = 0.448. Levene's test showed no violation of the assumption of equal error variance, as no dependent variables were ≤ 0.05 .

The results revealed statistically significant difference between the two groups who received a supplement (high / low stimuli) on the combined dependent variable where H_0 is rejected if $p \leq 0.05$ (Pallant, 2016, p. 320). $F = (2, 60) = 6.11$, $p = 0.004$, Wilk's Lambda = 0.831, $\eta^2 = 0.169$. The results for the dependent variables were thereby viewed separately, with a Bonferroni adjusted alpha level of ≤ 0.025

(Pallant, 2016, p. 320). Both dependent variables were significant between the two groups with an adjusted significance level: purchase intention, $p = 0.022$, attitude toward product, $p = < 0.001$. The mean scores showed that the high-stimuli group reported negative purchase intention and attitude compared to the low-stimuli group, congruent with the findings in the preliminary test and hypothesis 1.

Table 9: mean scores supplements (high / low)

Supplements		Mean	Lower Bound	Upper Bound
Purchase intention	Low stimuli	0.195	- 0.17	0.56
	High stimuli	- 0.405	- 0.764	- 0.046
Attitude	Low stimuli	-0.093	- 0.261	0.447
	High stimuli	- 0.775	- 1.124	- 0.427

Hence, the results show that increased use of feminine cues reduces purchase intention and attitude for a product where scientific competence is important.

Cosmetics

For the two groups that received a body cream (high / low stimuli), the MANOVA showed no violation of the homogeneity of variance-covariance matrices, Box's test of Equality of Covariance Matrices, $\text{sig.} = 0.472$. Levene's test showed no violation of equal error variance, $\text{sig.} = > 0.05$.

The results revealed no statistically significant difference between the two groups who received a body cream on the combined dependent variable, where H_0 is rejected if $p \leq 0.05$ (Pallant, 2016, p. 320). $F(2, 61) = 0.4$, $p = 0.672$, Wilk's Lambda = 0.987, $\eta_p^2 = 0.013$. As Wilk's Lambda were non-significant, we did not move forward with examining the Tests of Between-Subjects Effects on the separate dependent variables as we keep H_0 .

The results are not congruent with hypothesis 2 or the preliminary test, as we conceptualized that a hedonic product such as a cosmetic product with feminine cues will increase purchase intention and attitude. Instead, the results show no effect between a high and low level of stimuli for a cosmetic product, indicating that feminine cues for a hedonic product do no harm but also no magic.

3.2.4 Mediation analysis

As previously established in the analysis, a supplement with high levels of femininity caused a negative outcome in the dependent variables and we obtained a negative effect, where high level of femininity X caused low levels on attitude and purchase intention Y (Hayes, 2013, p. 91). As discussed in the literature, a supplement with high level of femininity is conceptually disfluent as it does not align with the competence of a utilitarian product (Phillipp-Muller et al., 2022), and thus, might seem less credible.

Hence, for hypothesis 3, we believe that this negative effect can be explained by Source Credibility M , which mediates the relationship of X on Y . Contrary, feminine stimuli X for a cosmetic product did not cause a variation in the dependent variables Y , indicating that Source Credibility M will not reduce purchase intention or attitude for a hedonic product, conceptualized in hypothesis 3a. Thus, this analysis investigates the mediating effect of Source Credibility on the two product categories separately. The mediation model(s) is visualized as the following (Hayes, 2013, p. 87):

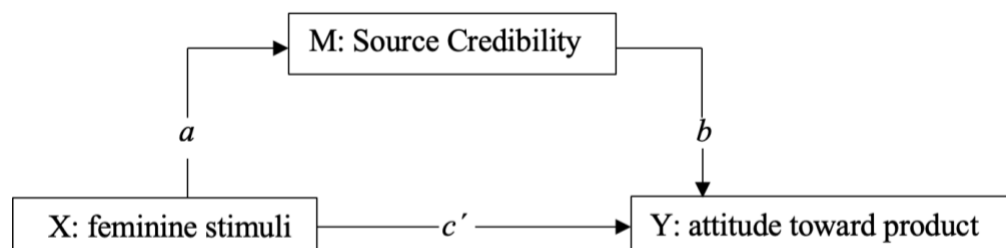


Figure 3: simple mediation model

For a mediation analysis, the *total effect* of X on Y is equal to the sum of the *direct* and *indirect effects* of X (Hayes, 2013, p. 93):

$$c = c' + ab$$

In a *total effect* model with dichotomous variable X , the c is interpreted as the difference between the two group means on Y (Hayes, 2013, p. 93):

$$c = [\bar{Y} | (X=x)] - [\bar{Y} | (X=x-1)]$$

The *direct effect* of X on Y is formulated as the following (Hayes, 2013, p. 91):

$$c' = [\hat{Y} | (X=x, M=m)] - [\hat{Y} | (X=x-1, M=m)], \text{ where } \hat{Y} \text{ is interpreted as the}$$

group mean since X is dichotomous, meaning that c' estimates the difference between the two group means holding M constant (Hayes, 2013, p. 91).

The *indirect effect* model of X on Y through M is the product of a and b (Hayes, 2013, p. 92). The indirect effect will be positive if a and b are both positive or negative but will be negative if either a or b is negative (Hayes, 2013, p. 92). The coefficient of a represents the two group means on M , and whether the case higher on X is estimated to be higher (+) or lower (-) on M (Hayes, 2013, p. 92):

$$a = [\bar{M} | (X = x)] - [\bar{M} | (X = x - 1)]$$

The b coefficient has similar interpretation to c' , except with M as the antecedent (Hayes, 2013, p. 91). The b coefficient determines whether the case higher on M is estimated to be higher (+) or lower (-) on Y (Hayes, 2013, p. 92):

$$b = [\hat{Y} | (M = m, X = x)] - [\hat{Y} | (M = m - 1, X = x)]$$

Results

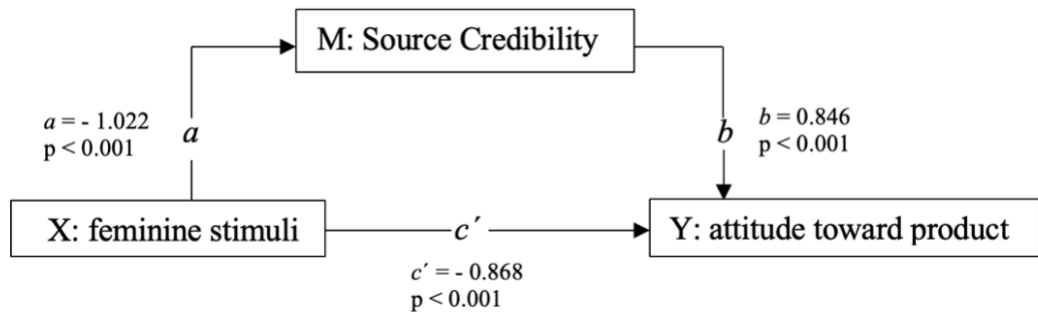
Several linear regression models were computed on a split datafile based of product category, measuring the effects of a , b and c' . For a mediation effect, the direct effect c' should be closer to 0 than the total effect c (van den Berg, 2023). The results firstly present the groups who received a supplement, followed by the groups who received a cosmetic product.

Supplements

Attitude toward product

Effect a , from X onto M was significant, $p = < 0.001$. Effect b , from M onto Y *attitude toward product* was significant, $p = < 0.001$. Effect c' , from X onto Y *attitude toward product* was significant, $p = < 0.001$. The direct effect c' was closer to 0 than the total effect c . Thus, Source Credibility mediates the effect of feminine stimuli of a supplement on attitude toward product. Moreover, the effect of Source Credibility on attitude toward product explains 74% of the variance. The *indirect effect* is negative, as effect of a is negative and effect of b is positive (Hayes, 2013, p. 92). Hence, Source Credibility mediates the effect of feminine stimuli X on

attitude toward product *Y* for a supplement product. The higher level of feminine stimuli on a supplement product, the lower perceived Source Credibility, and the higher level of Source Credibility, the higher attitude toward product. The results are visualized as the following:



Direct effect c' , attitude toward product = - 0.868

Total effect c , attitude toward product, $c' + ab = - 1.73$

Purchase intention

Effect a was significant, $p = < 0.001$, effect b was significant, $p = < 0.001$ and effect c' was significant, $p = 0.022$. The direct effect c' was closer to 0 than the total effect c . The impact of Source Credibility on purchase intention explained 58,8% of the variance. The impact of Source Credibility on purchase intention explained less variance than attitude toward product, however, this is not surprising as purchase intention is a more complex phenomenon to evaluate than a general attitude.

The *indirect effect* was negative (Hayes, 2013, p. 92). Source Credibility mediates the effect of feminine stimuli X on purchase intention Y . The higher level of feminine stimuli on a supplement product, the lower perceived Source Credibility, and the higher level of Source Credibility, the higher the purchase intention. The results are visualized in the following table:

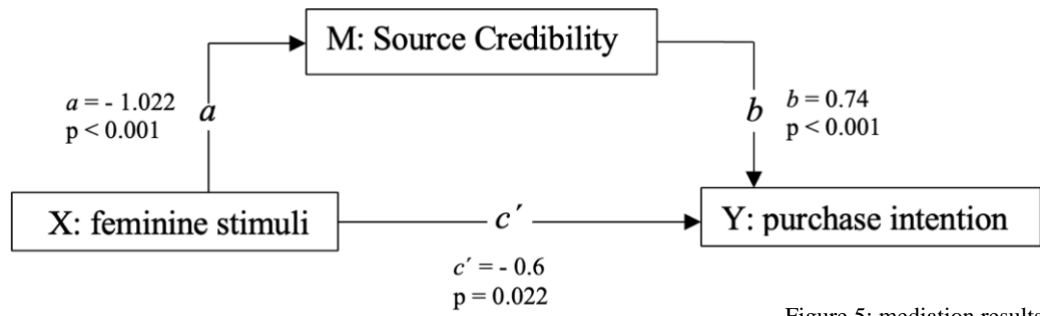


Figure 5: mediation results

Direct effect c' , purchase intention = - 0.6.

Total effect c , purchase intention, $c' + ab = - 1.35$

The mediator effects for both purchase intention and attitude toward product for the groups who received a supplement (high / low femininity) is presented in the following table:

Table 10: mediator effects, supplement groups

	Unstandardized B	F	Adjusted R ²	Sig.
Effect a				
Predictor: X stimuli	- 1.022	17.284	0.208	< 0.001
Dependent: M source cred.				
Effect b				
Predictor: M source cred.	0.846	183.184	0.746	< 0.001
Dependent: Y attitude				
Effect b				
Predictor: M source cred	0.740	89.401	0.588	< 0.001
Dependent: Y purchase intention				
Effect c'				
Predictor: X stimuli	- 0.868	12.238	0.153	< 0.001
Dependent: Y attitude				
Effect c'				
Predictor: X stimuli	- 0.6	5.495	0.068	0.022
Dependent: Y purchase intention				

Cosmetics

The results for the conditions who received cosmetics revealed no significant effect of *a*, $p = 0.268$. The model explained very little variance, $R^2 = 0.4\%$. In other words, feminine stimuli of cosmetics seem to have no impact on perceived Source Credibility, and Source Credibility seem to play an unimportant role in the context.

However, Source Credibility impacts the dependent variables significantly in a positive direction for effect *b*. The effect of *b* shows that the higher the perceived Source Credibility, the higher the purchase intention, $p = < 0.001$, $R^2 = 42,7\%$, $B = 0.776$, and attitude toward product, $p = < 0.001$, $R^2 = 60,1\%$, $B = 0.773$. The models show that perceived Source Credibility is unaffected when using high levels of feminine stimuli for a *cosmetic product*, although Source Credibility is an important determinant more generally for purchase intention and attitude toward product.

The mediator effects for attitude toward product and purchase intention for the groups who received a cosmetic product is presented in the following table:

	Unstandardized B	F	Adjusted R ²	Sig.
Effect a	- 0.224	1.247	0.004	0.268
Predictor: X stimuli				
Dependent: M source cred.				
Effect b	0.773	95.815	0.601	< 0.001
Predictor: M source cred.				
Dependent: Y attitude				
Effect b	0.776	47.930	0.427	< 0.001
Predictor: M source cred.				
Dependent: Y purchase intention				
Effect c'	- 0.171	0.728	- 0.004	0.397
Predictor: X stimuli				
Dependent: Y attitude				
Effect c'	- 0.098	0.170	- 0.013	0.681
Predictor: X stimuli				
Dependent: Y purchase intention				

Table 11: mediator effects, cosmetic groups

The results from the mediation analysis were congruent with hypothesis 3 and 3a. For products where scientific competence is important, such as supplement, increased use of feminine cues reduced the perceived credibility, and high perceived credibility is important for purchase intention and attitude. Thus, the lower the perceived credibility, the lower purchase intention and attitude. Moreover, increased use of feminine cues turned out to be unimportant for perceived source credibility, in line with hypothesis 3a. However, source credibility still turned out to be an important determinant for purchase intention and attitude for the groups who received a cosmetic product as well.

3.2.5 Moderation analysis

For hypothesis 4, we conceptualized that the effect of feminine product presentation depends on the product category. We wanted to investigate whether product category influences or is related to the relationship between X and Y (Hayes, 2013, p. 207), as the literature suggests that a high feminine product is more welcome in a hedonic product category over a utilitarian product category. The effect of X on some variable Y is moderated if its size, sign or strength depends on or can be predicted by a moderator M (Hayes, 2013, p. 208). “ M is said to be the moderator of X ’s effect on Y , or that M and X *interact* in their influence on Y ” (Hayes, 2013, p. 208). A simple moderation model is visualized as the following (Hayes, 2013, p. 209):

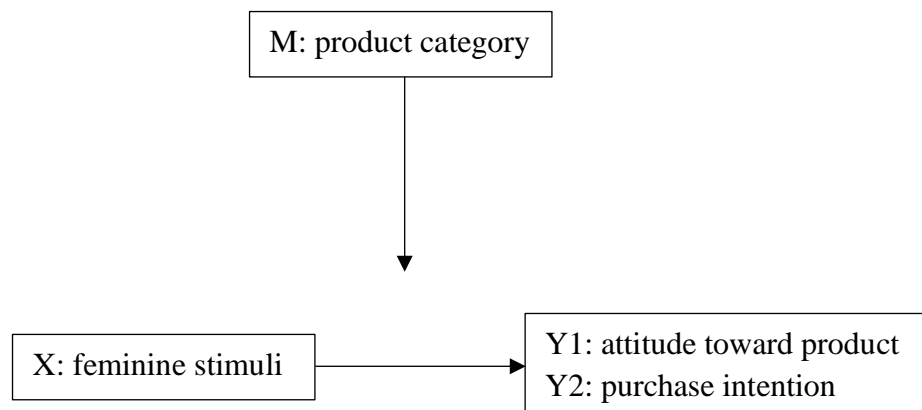


Figure 6: simple moderation model

The statistical moderation model(s) is visualized in the two figures (Hayes, 2013, p. 215):

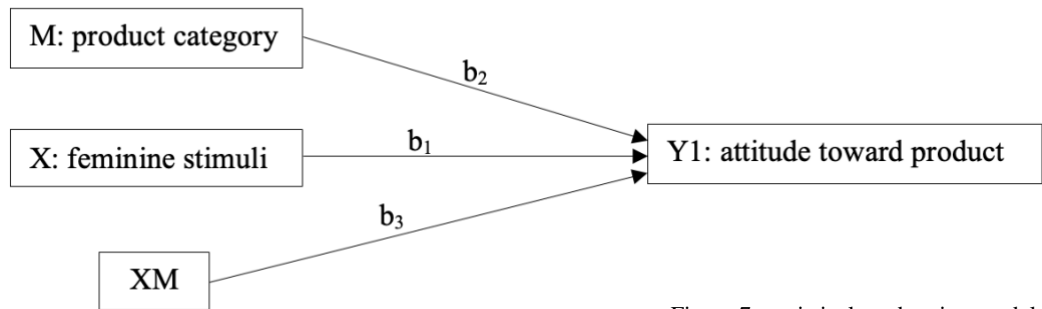


Figure 7: statistical moderation model 1

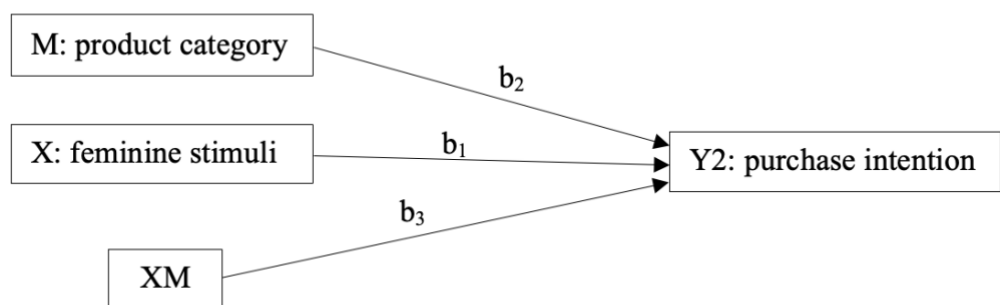


Figure 8: statistical moderation model 2

The equation is symbolized as the following, where XM is a variable made as the product of X stimuli and M product category, the *interaction variable* (Hayes, 2013, p. 214):

$$\hat{Y} = i_1 + b_1X + b_2M + b_3XM$$

When M *product category* is conceptualized as the moderator of X 's effect on Y , then b_3 estimates how much the difference in Y between two cases that differ by a unit on X changes as M changes by one unit (Hayes, 2013, p. 217).

Results

The analysis assessed the moderating role of product category M on the relationship between feminine stimuli X and attitude toward product $Y1$, or purchase intention $Y2$. Hierarchical regressions were computed (Hayes, 2013, p. 268) that revealed a moderating impact of XM on the relationship between feminine stimuli X and attitude toward product $Y1$. XM did not reveal a moderating role on the relationship

between feminine stimuli X and purchase intention $Y2$. That is, a feminine stimulus on attitude depends on the product category, but not for the purchase intention (Hayes, 2013, p. 286).

Attitude toward product

Model 1 computed the main effect b_1 of X on $Y1$ attitude toward product, on a split datafile of product category. We only include the group that received supplements for the effect of b_1 , which showed a significant negative effect of feminine stimuli on attitude toward product for the group who received a supplement:

Table 12: effect of b_1 , attitude toward product

Main effect b_1	Unstandardized B	Std. error	t	p	R^2	F
X stimuli → Y1 attitude	- 0.868	0.248	- 3.498	< 0.001	0.153	12.238

Model 2 with hierarchical variable entry added b_1 , b_2 and b_3 (Hayes, 2013, p. 268) for the whole dataset and not on a split file to obtain the moderating role of product category in relation to attitude toward product, where b_3 was significant:

Table 13: effect of b_1, b_2, b_3 , attitude toward product

$F = 11.438, R^2 = 0.199$	Unstandardized B	Std. error	t	p
X stimuli → Y1 attitude, b_1	- 0.868	0.226	- 3.850	0.001
M product category → Y1 attitude, b_2	0.343	0.231	1.484	0.140
XM interaction → Y1 attitude, b_3	0.689	0.318	2.191	0.03

Hence, hypothesis 4 was partly confirmed as the effect of feminine stimuli X and attitude toward product Y depended on the product category XM .

Purchase intention

Model 1 computed the main effect b_1 of X on Y_2 purchase intention, on a split datafile of product category. The effect of b_1 showed a significant negative effect of feminine stimuli on purchase intention for the group who received a supplement:

Main effect b_1	Unstandardized B	Std. error	t	p	R^2	F
X stimuli → Y2 purchase intention	- 0.6	0.256	- 2.344	0.022	0.068	5.495

Table 14: effect of b_1 , purchase intention

Model 2 with hierarchical variable entry added b_1 , b_2 and b_3 (Hayes, 2013, p. 268) for the whole dataset to obtain the moderating role of product category related to purchase intention, where b_3 was non-significant:

Table 15: effect of b_1, b_2, b_3 , purchase intention

$F = 2.530, R^2 = 0.035$	Unstandardized B	Std. error	t	p
X stimuli → Y2 purchase intention, b_1	- 0.6	0.176	- 2.424	0.017
M product category → Y2, purchase intention, b_2	- 0.034	0.254	- 0.133	0.895
XM interaction → Y2 purchase intention, b_3	0.502	0.349	1.436	0.153

Hence, we found support for that the effect of feminine stimuli on attitude toward product depends on the product category, whereas the effect of feminine stimuli on purchase intention is not supported to depend on the product category. Hypothesis 4 was therefore partly confirmed.

4. Summarized findings

The test results are presented in the following table:

Table 16: summarized findings

Hypothesis	Results
<p><i>H₁</i>: For products where scientific competence is important, increased use of feminine cues will reduce purchase intention and attitude towards product</p>	Supported
<p><i>H₂</i>: For products used for sensory gratification and affective purposes, increased use of feminine cues will increase purchase intention and attitude towards product</p>	Supported in pre-test Not supported in main study
<p><i>H₃</i>: For products where scientific competence is important, increased use of feminine cues will reduce the perceived credibility, which in turn will lead to reduced purchase intention and attitude</p>	Supported
<p><i>H_{3a}</i>: For products used for sensory gratification and affective purposes, increased use of feminine cues will not reduce the perceived credibility</p>	Supported
<p><i>H₄</i>: The effect of feminine product presentation depends on the product category. Product category has a moderating role on feminine product presentation</p>	Partly supported

5. Discussion

Theoretical contribution

In this study, we investigated the effects of feminine product presentation on purchase intention and attitude toward product through Source Credibility, for two different product categories. One of the product categories were supplements, whilst the other product category was cosmetics. We placed supplements as utilitarian, and cosmetics as hedonic, respectively. We found strong support for our research question which posed if feminine product presentation could backfire. We found that a utilitarian product with feminine cues, specifically a supplement, resulted in reduced purchase intention and attitude toward product relative to a scientific, traditional supplement presentation. Contrary, we found that a hedonic product with feminine cues, specifically a cosmetic product, had no effect on purchase intention and attitude relative to a neutral product presentation.

Moreover, we found strong support for the negative effect of feminine supplements through Source Credibility Theory (Lowry et al., 2013). The results revealed that feminine product presentation of a supplement significantly reduced perceived credibility, and that credibility is highly important for purchase intention and attitude toward product. For cosmetics, which is arguably hedonic, we found no negative effect of feminine cues on Source Credibility. Hence, this research shows that a utilitarian product suffers with credibility when using feminine cues, but not cosmetics. Additionally, we found moderating effects, where the effect of feminine product presentation depends on the product category for attitude toward product. The findings have important managerial implications to be discussed further.

Feminine product presentation on purchase intention and attitude

Although an increase of feminine supplements has been observed over the last years, this study found significant negative effects of using feminine cues on supplement products. This poses a question as to why these companies continue to actively release such products, when the results show that the traditional, scientific supplements perform significantly better.

The managerial implications drawn from these findings, is that marketers and new product developers of supplements should engage in more extensive research before releasing such a product. For supplements specifically, it seems important to elaborate testing and validation stages before launching a feminine supplement, or maybe not launch a feminine supplement at all. The results make it reasonable to assume that the companies who launch feminine supplements may be a result of following other brands in the industry and applying their strategy without investigating the effects, and that they are all part of a collective mistake.

The role of Source Credibility

The results revealed that feminine supplements significantly reduced perceived Source Credibility. Thus, Source Credibility turned out to be an important mechanism for why feminine supplements resulted in reduced purchase intention and attitude toward product. We believe that credibility is an especially important issue for supplements as products in this field arguably need high levels of trustworthiness and a feeling of expertise to be consumed. Respectively, a supplement with feminine product presentation was perceived significantly less credible than a scientific, traditional supplement. Hence, the managerial implication for this finding is that feminine supplements lack credibility, which might harm the brand itself. Therefore, it is highly important for marketers or new product developers to consider the effect a feminine supplement may cause for the brand credibility.

Moreover, Source credibility was not significantly reduced when feminine product presentation was applied for a cosmetic product, revealing that a utilitarian product in particular struggle with perceived credibility when using feminine cues, compared to a hedonic product. The managerial implication for this finding is that a feminine product presentation can be applied to a hedonic product as it does not harm the brand credibility, however, one must be careful when the product is utilitarian.

Product category

The results revealed no significant decrease in purchase intention and attitude toward product when the product was hedonic and feminine. Thus, this finding indicates that the product category matters in determining the effect of feminine product presentation on purchase intention and attitude toward product. The

moderation analysis revealed that the effect of feminine product presentation significantly depends on the product category when shaping an attitude toward the product. Thus, a managerial implication is that we recommend that marketers and new product developers thoroughly investigate whether their product is hedonic or utilitarian before they consider applying a feminine product presentation to their product.

5.1 Suggestions for further research

There are numerous paths to explore for further research. The sample used for this research is homogenous to some extent, and thus, one could replicate this study for a broader sample. As our sample consists of mainly highly educated respondents with similar places of residency, a different sample could have an impact on the results. It could be interesting to observe if the same findings would remain for a completely random sample to strengthen the generalizability of the findings. Moreover, this study only examines one utilitarian product and one hedonic product, a supplement and a cosmetic product. Thus, a path for further research could be to test other utilitarian and hedonic products through Source Credibility Theory to observe if the same results could be applied to other product categories. Lastly, unexplained variance still remained when testing the hypothesis through Source Credibility. Hence, a similar study investigating additional mediating factors could contribute to an even greater explanation of the effects found in this study.

6. Limitations

This study was conducted on female students at our campus, BI Norwegian Business School, in Oslo, Norway. Thus, this restraint the results found, as demographic variables specific to the sample population may affect the significance of the study, as well as the strength and/or direction of the results. The findings are therefore limited to this sample and other results could be found by changing some of these demographics in the sample population. Respectively, we note that the sample population in the main study consisted of women primarily in the age between 19 – 28, where many attend a private school in one of the world's most prosperous countries. Hence, we can assume that the level of education is higher for our sample than the general population, and therefore more skeptical towards

feminine supplements than less educated consumers. The results are therefore only generalizable to the population in which the sample was drawn from.

Prior to the analyses conducted on the dataset, several assumptions were tested to make sure the selected analyses were appropriate to apply to the dataset. Most, but not all assumptions were met. We recognize that these assumptions can limit the quality of the findings, and that meeting all assumptions would strengthen the validity and reliability of our results. In the preliminary test, Levene's test identified that the assumption of homogeneity of variances between groups was violated. This indicates that the variance of scores between the groups are not the same, meaning that the samples are obtained from populations of non-equal variances, which is not ideal (Pallant, 2016, p. 228). The assumption of sample size that should be met to conduct principal component analysis was violated for both the preliminary test and the main study, as no dataset met the criterion of sample size > 150 (Pallant, 2016, p. 208). This means that the sample might not be large enough to represent the total population, that might cause a threat to external validity.

Even though the study explored the differences of effects for a feminine product presentation between a utilitarian product category and a hedonic product category, the results are not generalizable to other product categories than supplements and cosmetics. However, the results could apply to other product categories, but need to be tested further.

In the preliminary test, it was found that feminine product presentation of cosmetics significantly increased purchase intention and attitude towards product. The main study found no such effect, resulting in a discrepancy between the preliminary test and the main study. Our study would have been more generalizable if the preliminary test and the main study displayed similar results. However, writing a master thesis limits the options for data collection, and more resources than we had access to would have been needed to obtain a complete optimal sample.

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Appendices

Appendix 1, scales

Manipulation check, 7-point scale (van Tilburg et al., 2015):

“Pick the statement you feel like suits the best relative to the product description and name you just read:”

1. Extremely unfeminine
2. Very unfeminine
3. Slightly unfeminine
4. Neutral
5. Slightly feminine
6. Very feminine
7. Extremely feminine

Purchase intention, 7-point scale (Kozup et al., 2003):

“How unlikely/likely is it that you would purchase this product:”

(1 = very unlikely, 7 = very likely)

- Given the product description you received?
- Given that you were interested in such a product?
- Given both the product description you received and that you were interested in such a product?

Attitude toward product, 7-point scale (Kozup et al., 2003):

“What is your general attitude toward the product, given the product description and name you received?”

- Bad/good? (1 = very bad, 7 = very good)
- Unfavorable/favorable? (1 = very unfavorable, 7 = very favorable)
- Negative/positive? (1 = very negative, 7 = very positive)

Source Credibility (Lowry et al., 2013), 7-point scale:

“Which attributes would you ascribe to the company behind the product you received?”

Trustworthiness, 5 items:

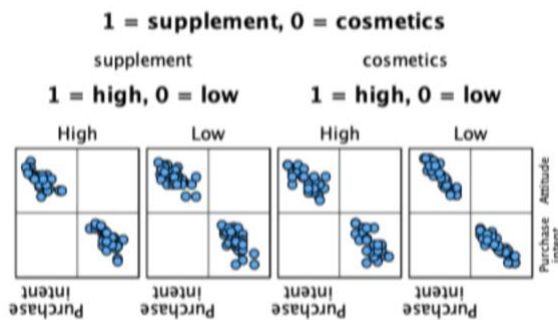
- Dangerous/Safe? (1 = very dangerous, 7 = very safe)
- Dishonest/Honest? (1 = very dishonest, 7 = very honest)
- Unreasonable/Reasonable? (1 = very unreasonable, 7 = very reasonable)
- Irresponsible/Responsible? (1 = very irresponsible, 7 = very responsible)
- Irrational/Rational? (1 = very irrational, 7 = very rational)

Expertise, 4 items:

- Inexperienced/Experienced? (1 = very inexperienced, 7 = very experienced)
- Untrained/Trained? (1 = very untrained, 7 = very trained)
- Uninformed/Informed? (1 = very uninformed, 7 = very informed)

Appendix 2, Matrix scatter plot from SPSS:

Preliminary test



Main study

