Numerous researchers have hypothesized that the body size of advertising models (slim, average, or heavy) affects consumer responses to the promoted product. Studies presented in this paper indicate that, for young average-sized and heavy consumers, the depiction of average-sized models leads to relatively favorable product evaluations. For slim consumers, images of slim models result in positive product evaluations. This interaction effect has not been shown in prior research thus far. More-detailed analysis provides the result that model attractiveness, appearance self-esteem, and perceptions of overall model-self similarity are mediating variables that statistically explain the effect of model body size on product evaluations. These mediating effects have been postulated in prior research but have not been successfully tested thus far. Marketing practice should use average-sized models when average-sized or heavy consumers are addressed. The use of slim models in advertisements should only be considered when slim consumers are targeted.

1. Introduction

1.1. “Slim = beautiful” stereotype, controversial debates, and recent developments

In recent decades, body slimness has received increasing attention. To the best of our knowledge about the history of advertising in Western societies, one of the first advertisements promoting the desirability of a slim figure was used by cigarette brands such as Lucky Strike in the fifties, which promised a slim female figure when smoking. Especially regarding advertising of fashion, fitness, and diet products, slim models have become predominant. Lesley Lawson, born in 1949 and known as Twiggy (meaning that she was as thin as a twig) is one of the most famous supermodels promoting fashion. She was repeatedly depicted on the cover page of Vogue fashion magazine. Currently, Rachel Zoe, a promoter of the “size zero” trend, is one of the most famous fashion designers. In 2014, fashion brand Victoria’s Secret launched a campaign entitled “The perfect body,” which showed very slim female models. H&M depicted Victoria Beckham, a very slim celebrity, in its ads in 2015. Marks and Spencer offer a “Twiggy collection” of their clothes. The existence of the “slim = beautiful” stereotype is also associated with favorable attitudes of consumers regarding diet products and fitness. According to a survey of the Institut für Demoskopie Allensbach (2018) in Germany, 6.2% of consumers are interested in diet and diet products. At least occasionally, 29.1% male and 25.8% female consumers visit fitness centers. There are influencers on Instagram with rather slim figures who specialize in promoting fitness programs and diet products; these influencers have many followers (e.g., the German influencers Sophia Thiel with 1.3 million followers and Pamela Reif with 4.1 million followers, and the Australian influencer Kayla Itsines with 11.1 million followers in February 2019). These figures indicate a large societal agreement with the “slim = beautiful” stereotype.

However, the increasing acceptance of the “slim = beautiful” stereotype has also caused severe problems. For instance, in November 2006, 21-year-old Brazilian model Ana Carolina Reston Macan (weight: 40 kg, height: 1.74 m, BMI = weight/squared height = 13.2 kg/m²), who promoted the Armani fashion brand, died due to consequences of anorexia. A few months before the death of this model, 22-year-old Uruguayan model Luisel Ramo

Acknowledgements: The author wishes to thank two reviewers for manifold valuable comments that were used to improve this paper.
In 2010, French model Isabelle Caro also died from consequences of anorexia (30 kg, 1.65 m, BMI=11.0). Shortly before her death, she was depicted on a well-known billboard that promoted the Italian fashion brand No-l-ita and aimed to warn others about eating disorders. In 2012, a law was passed by the Israeli government requiring models to have a BMI of no less than 18.5. Since 2017, models in France have been required to certify their health by a doctor to prevent dangerous underweight.

In addition to the reports about the potentially life-threatening consequences of extreme slimmness for fashion models, there are numerous studies indicating that the “slim = beautiful” stereotype elicits negative mood in non-slim consumers, causes dissatisfaction with one’s own figure (i.e., reduces appearance self-esteem), leads people to take unhealthy measures to reach a small body size, fosters eating disorders such as bulimia in young women who do not conform to the idealized body shape (e.g., Flanmery-Schroeder and Chisrler 1996; Mendelson et al. 2002), and may even cause depression (Hankin and Abramson 2001). Grabe et al. (2008) conducted a meta-analysis based on 77 experiments published in the literature and found that the frequency of the “exposure to media images depicting the thin-ideal body is related to body image concerns for women” (p. 460).

As a consequence of these developments, there were controversial debates in public about the appropriateness of ad campaigns showing female models with a very slim figure. For instance, posters launched in 2015 promoting diet products of Protein World that showed a slim female model together with the question “Are You Beach Body Ready?” provoked such a debate in the UK.

Thus, most probably in response to such debates, some advertisers and media companies altered the practice of using slim models and depicted average-sized models. In recent history, the most famous campaign based on the use of average-sized models was launched by Dove, a cosmetics brand of Unilever. Unilever (2004) has conducted surveys such as the “Dove Beauty Studie” in Germany. In this survey, females were asked to indicate which attributes a woman must have to conform to the “current female ideal.” Of 16 attributes (e.g., personal charisma and self-confidence), the attribute “is slim but not too thin” received the strongest agreement. In the subsequently created campaign denoted “Real Women,” print advertisements depicted average-sized females. Approximately 50 million YouTube visitors viewed the Dove commercials entitled “Dove Evolution” and “Dove Model Before and After.” This campaign was associated with overwhelming economic success. For instance, in Germany, the percentage of women stating that they use Dove cosmetics increased considerably (2006: 15 %, 2008: 21 %, 2010: 21 %, and 2012: 31 %). These data are taken from Brigitte Kommunikationsanalyse of Gruen+Jahr, which offers data from large surveys (approximately 5,000 female respondents per issue). Similarly, the Nike brand was promoted by the average-sized “Nike girl.” The editors of Brigitte, a German magazine primarily targeting women, decided in 2009 to depict average-weight amateur females only (in 2012, they returned to the depiction of professional models).

Some companies started to additionally use so-called plus-size models to promote their brands (e.g., Myla Delbosio depicted in Calvin Klein advertisements, Tara Lynn promoting lingerie brands, Ashley Graham shown in swimsuitsforall.com, Robyn Lawley in ads for the Swimsuit brand, and Iskra Lawrence promoting American Eagle Outfitters lingerie). Some female models increased their weight and became plus-size models (e.g., the former “Germany’s next top model” Sarina Nowak). Ashley Graham was the first plus-size model depicted on the cover of Sports Illustrated in 2016. Beginning in 2016, the German TV casting show “Curvy models” presented heavier females, in contrast to the “Germany’s next top model” show.

However, despite concerns regarding the use of slim models in advertising and the practice of some fashion companies and editors of magazines who decided to refrain from depicting very slim models any longer, slim models are still prevalent in media and advertising. Obviously, many marketers still rely strongly on the effectiveness of slim models. Thus, what should advertisers do? Should marketers continue to use slim models? Or is the use of average-sized models as effective as the depiction of slim models?

1.2. Gaps in prior academic research and research questions

First, many researchers found that model body size affects perceptions of the models’ attractiveness, indicating that the “slim = beautiful” stereotype is still valid. However, some researchers also presume that body size and attractiveness are unrelated (D’Alessandro and Chitty 2011). There are arguments in the literature that attractiveness may result from the models’ face (Sofer et al. 2015), the waist-to-hip ratio (Singh 1994), and muscle strength of male persons (Muth and Cash 1997) independently of body size. Thus, there is a gap in research; we do not know whether there is really a strong effect of model slimmess on attractiveness. Our first research question is as follows:

**RQ1:** What is the shape of the relationship between model body size and model attractiveness? How strong is this relationship?

Second, with few exceptions, researchers tested the effectiveness of model body size by using advertisements that promoted products that are related to one’s appearance (e.g., cosmetics, perfume, textiles, and gym). In advertising practice, models are also frequently used to promote products that do not contribute to one’s physical appearance (e.g., furniture, telecommunications services, and laptop computers). Thus, there is a gap in re-
search because there is no answer to the question about whether the relevancy of the promoted product to fostering one’s appearance should be regarded as a moderating variable:

**RQ2:** Does the product category (whether or not appearance-related) shape the relationship between model body size and product evaluations?

If additional research provides evidence addressing the presumption that the product category (whether or not appearance-related) to which the promoted product belongs to is a moderating variable that shapes the relationship between model body size and product evaluation, distinct recommendations could be provided for practice when choosing models according to their body size.

Third, previous advertising research mainly focused on two distinct processes elicited by model body size (we provide a review of this research in Section 2): an effect via model attractiveness and an effect via consumer’s appearance self-esteem. If slim models are perceived as attractive but also evoke concerns about one’s own figure, the question arises of whether only the effect via attractiveness is relevant but the effect via appearance self-esteem on product evaluations is irrelevant (as suggested by D’Alessandro and Chitty 2011). What would be the reason for this difference? If both factors (model attractiveness and appearance self-esteem) are relevant and one of the factors is predominant, why did some researchers find that the use of average-sized models resulted in the most favorable product evaluations, i.e., an inverted U-shaped relationship? Model-self similarity would be highest if average-sized consumers view average-sized models; this factor could then also be used to explain an inverted U-shaped relationship. Thus, there is a gap in research because the mediating effects of appearance self-esteem and model-self similarity have not been systematically investigated thus far:

**RQ3:** What roles do model attractiveness, appearance self-esteem, and model-self similarity play in the relationship between model body size and product evaluations?

An answer to this question by additional research could increase knowledge about the mental processes that occur when consumers have contact with slim, average-sized, or heavy models.

Fourth, researchers did not consider the consumer’s own body size a factor when examining the effect of model body size on product evaluations. This factor would matter if model-self similarity explains product evaluations in response to different levels of model body size. D’Alessandro and Chitty (2011) and Borau and Bonnefon (2017) also measured the consumer’s body size; however, these authors did not analyze the interaction effect of the model’s and the consumer’s body size. Because there is a gap in research about this interaction effect, we ask the following:

**RQ4:** Do consumers with slim, average, or heavy body size evaluate the promoted product differently depending on the model’s body size?

Cinelli and Yang (2016, p. 472) stated that two-thirds of the adult population in the United States “is made up of overweight and obese consumers.” In other Western countries, this portion might be lower (Seidell and Flegal 1997). Thus, additional findings about the interaction effect of model and consumer body size on product evaluations could assist marketers when choosing the appropriate models, for instance, whether it is most effective to attract heavy consumers with heavy models.

In the following, we provide an overview of prior research on the effect of model body size and theoretical backgrounds. Then, we present the findings from four studies that we have conducted to find answers to the research questions and to test the hypotheses. We focused on young female and male consumers and models who are depicted in a decorative role, i.e., we did not consider spokespersons who explicitly recommend the product. Finally, we draw conclusions from our results.

### 2. Findings from prior research

In this section, we provide a review of the literature investigating the effect of model body size on product evaluations (note that we already used these findings to identify gaps in research in Section 1.2.). We used keywords such as “body size” in combination with “brand attitude” to identify articles and used the reference list of each of these articles to find additional publications. We focus on experiments of researchers who manipulated model body size as an experimental factor, integrated the model depictions in advertisements, and examined the consumers’ response to the promoted product. This procedure resulted in a list of 20 publications (Tab. 1).

The authors mostly follow the classification of the World Health Organization (2006) that classifies adult people according to BMI (= weight/squared height). A body mass index ranging from 18.5 to 25 kg/m² is described as “normal.” We denote persons with “normal” BMI as average-sized persons and persons with BMI values below or above this range as slim or heavy persons. Admittedly, terms such as normal or average might be misleading, and a term such as “healthy” BMI might be more adequate. However, as terms such as slim (or thin), average, and heavy (or large, round, etc.) are widespread in the academic literature (e.g., Bian and Wang 2015), we adopted this terminology.

#### 2.1. Effect of the model’s body size shown in advertisements on product evaluations

Martin et al. (2007), Westover and Randle (2009), Diehrichs and Lee (2010), Martin and Xavier (2010), D’Alessandro and Chitty (2011), and Hüttl and Gierl (2012) created advertisements that contained an image of

<table>
<thead>
<tr>
<th>Source</th>
<th>Levels of model body size</th>
<th>Test objects</th>
<th>Test persons</th>
<th>Effect of model slimness on model attractiveness</th>
<th>Effect of model slimness on appearance self-esteem</th>
<th>Effect of model slimness on the product evaluations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shaw and Kemeny (1989)</td>
<td>slim, average, heavy</td>
<td>poster that promoted fitness</td>
<td>female students</td>
<td>n.a.</td>
<td>model slimness reduces satisfaction with one’s own body weight</td>
<td>slim is better (slim models were most encouraging)</td>
</tr>
<tr>
<td>Halliwell and Dittmar (2004)</td>
<td>slim, average</td>
<td>deodorant</td>
<td>females</td>
<td>no effect</td>
<td>model slimness results in greater body-focused anxiety</td>
<td>no effect</td>
</tr>
<tr>
<td>Martin et al. (2007)</td>
<td>slim, heavy</td>
<td>salad, burger</td>
<td>female students</td>
<td>no effect</td>
<td>model slimness impairs appearance self-esteem</td>
<td>slim is better for people who believe that they control their weight</td>
</tr>
<tr>
<td>Häfner and Trampe (2009)</td>
<td>slim, average</td>
<td>deodorant and cosmetics</td>
<td>female students</td>
<td>slim is more attractive</td>
<td>n.a.</td>
<td>average is better</td>
</tr>
<tr>
<td>Westover and Randle (2009)</td>
<td>slim, heavy</td>
<td>soda beverage</td>
<td>students</td>
<td>slim is more attractive</td>
<td>n.a.</td>
<td>slim is better for people not on a diet; heavy is better for people on a diet</td>
</tr>
<tr>
<td>Martin and Xavier (2010)</td>
<td>slim, heavy</td>
<td>salad, hamburger</td>
<td>students</td>
<td>n.a.</td>
<td>n.a.</td>
<td>slim is better for salad if people believe that they control their weight</td>
</tr>
<tr>
<td>Trampe et al. (2010)</td>
<td>highly attractive slim model wearing underwear, “average-looking” model</td>
<td>diet product, deodorant, shampoo, computers</td>
<td>females</td>
<td>slim is more attractive</td>
<td>n.a.</td>
<td>slim is better</td>
</tr>
<tr>
<td>Dittrichs and Lee (2010)</td>
<td>average-slim, average-large (male models)</td>
<td>jeans, belts, moisturizer, cologne</td>
<td>students</td>
<td>no effect</td>
<td>no effect</td>
<td>no effect (both for female and male consumers)</td>
</tr>
<tr>
<td>Dittrichs and Lee (2011)</td>
<td>slim, average</td>
<td>clothing and beauty products</td>
<td>students</td>
<td>no effect</td>
<td>model slimness impairs body image state</td>
<td>no effect</td>
</tr>
<tr>
<td>D’Alessandro and Chitty (2011)</td>
<td>slim, heavy</td>
<td>slimming center, clothing</td>
<td>students and nonstudents</td>
<td>slim is more attractive</td>
<td>n.a.</td>
<td>contradictory results</td>
</tr>
<tr>
<td>Yu et al. (2011)</td>
<td>slim average</td>
<td>apparel brand</td>
<td>students</td>
<td>no effect</td>
<td>n.a.</td>
<td>no effect</td>
</tr>
<tr>
<td>Roozen and Adams (2011)</td>
<td>slim, average, heavy</td>
<td>perfume, body lotion, and a fashion magazine</td>
<td>students</td>
<td>slim is more attractive</td>
<td>n.a.</td>
<td>slim is better</td>
</tr>
<tr>
<td>Hüttl and Gierl (2012)</td>
<td>slim, heavy</td>
<td>telecommunication service, clothing product</td>
<td>female students</td>
<td>n.a.</td>
<td>n.a.</td>
<td>slim is better</td>
</tr>
<tr>
<td>Anderson and Paas (2014)</td>
<td>very slim, average</td>
<td>clothing product</td>
<td>female students</td>
<td>average is more attractive</td>
<td>n.a.</td>
<td>average is better</td>
</tr>
<tr>
<td>Sohn and Youn (2013)</td>
<td>slim, average, heavy</td>
<td>no information</td>
<td>students</td>
<td>n.a.</td>
<td>n.a.</td>
<td>average is better</td>
</tr>
<tr>
<td>Jansen and Paas (2014)</td>
<td>model across seven levels ranging from very slim to average</td>
<td>fashion brand</td>
<td>females</td>
<td>n.a.</td>
<td>n.a.</td>
<td>U-shaped (slightly slim is better than very slim or average)</td>
</tr>
<tr>
<td>Yu (2014)</td>
<td>slim, average</td>
<td>clothing brand</td>
<td>female students</td>
<td>n.a.</td>
<td>model slimness increases body dissatisfaction</td>
<td>no effect</td>
</tr>
<tr>
<td>Bian and Wang (2015)</td>
<td>slim (“zero-size”), average</td>
<td>fashion brand</td>
<td>female students</td>
<td>no effect for established brands, average better for new brands</td>
<td>n.a.</td>
<td>no effect for established brands, average is better for a new brand</td>
</tr>
<tr>
<td>Åkestam et al. (2017)</td>
<td>slim (“traditional”), average (“femverting”)</td>
<td>underwear</td>
<td>females</td>
<td>n.a.</td>
<td>n.a.</td>
<td>average is better</td>
</tr>
<tr>
<td>Borau and Bonnefon (2017)</td>
<td>slim, average (“like Dove-model”)</td>
<td>body cream, body oil</td>
<td>young females</td>
<td>slim is more attractive</td>
<td>model slimness causes body anxiety and negative affect</td>
<td>no effect</td>
</tr>
</tbody>
</table>

Note: n.a. indicates that effects are either not investigated or not reported.

Tab. 1: Overview of prior studies on the effect of model body size on consumer responses

either a slim or heavy model. These researchers mostly reported that slim models resulted in more-favorable product evaluations than did heavy models. Some of these authors additionally included special aspects such as whether the consumer is on a diet or whether s/he believes that s/he is able to control her/his own weight and found moderating effects of such variables. Häfner and Trampe (2009), Trampe et al. (2010), Diedrichs and Lee...
In summary, while heavy models generally tend to be disadvantaged, studies’ results about the advantage of slim vs. average models are mixed. We tried to reveal reasons for the heterogeneous findings.

First, we looked at characteristics of the categories from which the products were chosen to create advertisements with the purpose of testing the model-body-size effect. With few exceptions, the researchers used products with a strong fit to sports (e.g., slimming center), nutrition (e.g., salad, soda, and diet products), or attractiveness of one’s own appearance (e.g., cosmetics, perfume, and textiles). Three studies also considered hamburgers or computers as test products. The results did not indicate that the shape of the model-body-size/product-evaluation relationship is systematically contingent on the type of product.

Second, we looked at characteristics of the test persons as possible reasons for the mixed findings of the previous studies. However, the researchers mostly used young female consumers (typically female students) as test participants. Borau and Bonnefon (2017) also assessed the body size of the consumers themselves; however, they did not analyze the interaction effect of the model’s and consumer’s body size on brand evaluations.

Third, we looked at the time when the studies were conducted. A majority of studies conducted between 1989 and 2011 found that slim models are more effective or that model body size does not matter. The majority of studies published since 2012 indicated that average-sized models do better at influencing evaluations of the promoted product (Sohn and Yoon 2013; Anderson and Paas 2014; Janssen and Paas 2014; optimum within the range between slim and average; Bian and Wang 2015 for a new brand; Åkestam et al. 2017). Such findings suggest that the effect of model body size on product evaluations might have changed over time.

In summary, prior research indicates that the depiction of slim or average models has a positive effect on product evaluations compared to images of heavy models. There is also a tendency that studies conducted three or two decades ago reported favorability of slim models, while studies conducted more recently indicated that average-sized models might result in comparatively better product evaluations. Advertising campaigns such as the “Real Beauty” campaign promoting Dove cosmetics or decisions of magazine editors to avoid the depiction of very slim models might have caused such changes.

2.2. Effect of the model’s body size shown in advertisements on model attractiveness and appearance self-esteem

We also looked at the variables that the researchers additionally examined to explain the model-body-size effect on product evaluations. Numerous researchers investigated consumer perceptions of model attractiveness in combination with investigations of product evaluations (see Tab. 1).

A majority of studies found that slim models are judged more attractive. With rather few exceptions, researchers who included models with different body size in advertisements found that slim models are perceived as more attractive than are average-sized or heavy models (Peck and Loken 2004 for an ad in a traditional women’s magazine; Häfner and Trampe 2009; Westover and Randle 2009; Bissell and Rask 2010; Trampe et al. 2010; D’Alessandro and Chitty 2011; Roozen and Adams 2011; Bian and Foxall 2013 for a well-known brand; Borau and Bonnefon 2017).

However, some studies also showed that slim models depicted in ads impaired appearance self-esteem. To assess appearance self-esteem, the researchers used rather similar concepts such as satisfaction with one’s own body weight (Shaw and Kemeny 1989; Yu 2014), body-focused anxiety (Halliwell and Dittmar 2004; Borau and Bonnefon 2017), or body-image state (Diedrichs and Lee 2010 and 2011; D’Alessandro and Chitty 2011). This negative effect of slimness is rather consistent across the studies.

We surmise that considering only model attractiveness and appearance self-esteem cannot sufficiently explain why some authors, especially in recent studies, found an inverted U-shaped relationship between model slimness and product evaluations. The objective similarity between model body size and consumer body size and overall perceptions of model-self similarity might be factors that could explain this relationship shape. Yu et al. (2011) already found an effect of similarity perceptions on product evaluations; however, they failed to provide evidence for an effect of model body size on similarity perceptions.

3. Conceptual background

In this section, we provide arguments about why we considered three mediating variables in the relationship between model slimness and product evaluations and why we included particular moderating variables in combination with each mediating variable.
3.1. Model attractiveness as a mediator between model body size and product evaluations

Researchers often stated that the attractiveness of other persons is “in the eye of the beholder” and that attractiveness is thus a perceptual concept (e.g., Joseph 1982). To provide a more sophisticated definition of attractiveness, one could argue that if a person elicits approach tendencies in the perceiver due to her/his physical appearance (e.g., if the perceiver enjoys taking a long look), s/he is attractive.

3.1.1. Effect of model body size on model attractiveness

There is no doubt that slimness of human figure is one of the major determinants of physical attractiveness in Western societies (Fallon and Rozin 1985; Anderson et al. 1992). There is a “slim = beautiful” stereotype that people start to learn in early childhood (Martin and Kennedy 1993; Martin and Gentry 1997; Cramer and Steinwert 1998) and that is reinforced in adolescence. Children learn this stereotype when playing with dolls such as Barbie. Greenleaf et al. (2006) argued that adolescents make the connection that slim mates have many friends, are happier, etc., whereas heavy mates have no or only few friends and are regarded as being lazy. Due to such observations, people likely internalize the stereotype that slim persons are more attractive. Greenleaf et al. (2006) found that even the depiction of the silhouette of a thin person was perceived as more handsome than a silhouette representing a heavy person. As adults, people also observe that slim persons are denoted as attractive by media and are admired. As the main source of this stereotype, “media” in general is regarded as responsible. Researchers often reported that compared to the actual population, slim persons are strongly overrepresented on TV, in magazines, and as models shown in advertisements (e.g., Halliwell and Dittmar 2004), resulting in a biased perception of average or healthy weight and the development of slimmness-attractiveness associations (Richins 1991; Ogden and Mundray 1996; Agliata and Tantleff-Dunn 2004; Bessenoff and Del Priore 2007; Trampe et al. 2007). Further, researchers stated that Western society has moved toward increasingly thinner celebrities and models who are regarded as physically attractive (Furnham and Nordling 1998). For instance, Sypeck et al. (2004) pointed to the fact that Miss America contestants had become increasingly thinner over the years. Content analyses suggested that there was an increase in the frequency with which media and advertisers depicted thin and beautiful persons (Silverstein et al. 1986; Wiseman et al. 1992; Sypeck et al. 2004). The winner of America’s Next Top Model, a popular reality show, in 2010 was the 19-year-old Ann Ward. She had a weight of 45 kg and a height of 1.88; her BMI of 12.7 indicated strong underweight. Generally, the undoubtedly beautiful contestants of such shows are very slim, which enhances the “slim = beautiful” stereotype among the audience. With respect to gender differences, numerous researchers in this field (e.g., Cohn and Adler 1992) stated and showed that women in particular regard a relatively slim figure as ideal and attractive. We conclude that consumers learn the “slim is beautiful” stereotype and hypothesize the following:

H1a: The slimmer the model, the higher is the perceived attractiveness.

Note that we do not consider extremely slim models who are recognizably in the terminal stages of anorexia or extremely heavy models who strongly suffer from obesity.

3.1.2. Effect of model attractiveness on product evaluations

There may be different reasons that model attractiveness spills over onto product evaluations. First, contact with an attractive model likely increases the consumer’s attention. As a side effect, the consumer may also give more attention to the promoted product (if there is no “vampire effect”; Erfgen et al. 2015) and recognize its benefits. Second, if the model is able to provoke positive impressions whereas the promoted product cannot do so, the consumer is expected to “balance” the contradictory beliefs by suppressing negative thoughts about the promoted product to avoid dissonance; this argument is derived from dissonance theory (Festinger 1957). Many researchers analyzed the impact of model attractiveness on product evaluations and found a positive effect (e.g., Reingen and Kerman 1993; Buunk and Dijkstra 2011). Thus, we posit the following:

H1b: Model attractiveness positively influences product evaluations.

3.1.3. Moderating role of the product type

In the case of appearance-related products such as jeans, perfume, underwear, or cosmetics, models with an attractive figure might be processed as a piece of information about the product itself (Pettty and Cacioppo 1986, p. 186). Similarly, Trampe et al. (2010) posit that an attractive model serves as a persuasive argument in favor of an appearance-related product. Imitating the model (by choosing the product) could enable the consumer to increase her/his similarity with or virtually and mentally approach the attractive model (for the process of imitation, see Kelman 1961). Attractive persons are believed to be happier and more successful in life than are less attractive persons (Dion et al. 1972). Thus, increased similarity to an attractive model could promise such positive effects for the consumers themselves. The hypothesis that attractive models have a positive effect for promoting appearance-related products whereas model attractiveness does not matter for appearance-unrelated products is also denoted the “match-up hypothesis” (Kahle and Homer 1985; Kamins 1990). However, the validity of this hypothesis is unclear. For instance, Baker and Churchill (1977) exposed consumers to either attractive or less attractive models, promoting an appearance-relat-
ed product (fragrance) or an appearance-unrelated product (coffee). Independently of the product, they found that the attitudes toward the promoted product were higher when an attractive model was depicted in the ad. In contrast, Bower and Landreth (2001) found a positive effect of model attractiveness for appearance-related products (earrings and lipsticks) but not for acne cover or acne treatment (which were denoted beauty-correction products). Based on these considerations, we test the following hypothesis:

\[ H1c: \text{The effect of model attractiveness on product evaluations (as suggested in } H1b) \text{ is stronger for appearance-related products compared to appearance-unrelated products.} \]

3.2. Appearance self-esteem as a mediator between model body size and product evaluations

Greenwald et al. (2002, p. 5) defined self-esteem as “the association of the concept of self with a valence attribute.” Self-esteem is high (vs. low) if the self, i.e., one’s own characteristics, are evaluated as very favorable (vs. less favorable). Grover et al. (2003) postulated that for many women, weight is a defining aspect of their value. Thus, the presence (vs. absence) of a deviation from the desirable body size is a major reason that appearance self-esteem is low (vs. high). Argo and White (2012, p. 67) defined appearance self-esteem as the “self-worth a person derives from his or her body-image and weight.”

3.2.1. Effect of model attractiveness on appearance self-esteem

Based on a review of previous studies, Richins (1991) reported that there is a very long tradition of discussing the effect of contact with physically attractive models on the perception of the self-appearance of average-sized and heavy people. Referring to Festinger’s (1954) social comparison theory, she posits that individuals “have a drive to evaluate themselves and that they evaluate themselves by comparison with others” (Richins 1991, p. 72). These comparisons could be made consciously, as Festinger suggests, or unconsciously. When comparing one’s own physical appearance with professional models who are very attractive and, especially for female models, rather thin, the consumer recognizes a discrepancy between these models and the self. Richins (1991) found that there were two streams in the literature that predicted different responses to this self-other discrepancy. One position states that people do not take depictions of very attractive models literally; thus, a discrepancy between one’s own appearance and the image of such models does not affect their self-image. The other position postulates that self-image is impaired. This effect results if the contact with highly attractive models shifts the evaluation standard for attractiveness comparisons upwards, e.g., increases perceptions about what level of physical attractiveness is average or normal. Compared to the increased comparison standard, the perception of one’s own appearance is lower, resulting in envy regarding attractive others, negative mood, self-doubt, lower self-satisfaction, reduced self-confidence, etc. Further, Richins (1991) postulated that the answer to the question about whether the contact with very attractive models has either no or a negative effect on self-satisfaction is contingent on whether the individuals consider very attractive models a separate category of people (not resulting in a shift in the reference standard) or consider them ordinary people (resulting in a shift in the reference standard). To test these propositions, she exposed a sample of female students to many magazine ads showing highly attractive models and another sample of female students to ads that did not show any models. She found that the test participants rated their self-attractiveness lower if they had contact with the images of highly attractive models. These findings are consistent with the presumptions that (1) consumers count highly attractive media models in the group of ordinary people, and (2) contact with depictions of highly attractive models increases the comparison level, indicating what level of attractiveness is average or normal, which (3) subsequently results in impaired own appearance self-esteem. We test the following:

\[ H2a: \text{Perceptions of model attractiveness influence appearance self-esteem negatively.} \]

3.2.2. Effect of model body size on appearance self-esteem

Richins (1991) considered the concept of physical attractiveness of models. Because numerous researchers found that model slimness is associated with model attractiveness (i.e., provide support to the existence of the “slim = beautiful” stereotype), the considerations provided above could be transferred to a direct relationship between model body size and perceivers’ appearance self-esteem. Viewing slim models likely changes (i.e., lowers) the reference standard that is used to recognize normal or average weight. In comparison with the lowered level, one’s own weight appears to be higher, resulting in reduced appearance self-esteem in average-sized or heavy consumers. Most researchers provided evidence for this presumption and reported an unfavorable effect of model slimness on body satisfaction (Shaw and Kemeny 1989), one’s body image (meta-analysis conducted by Groesz et al. 2002), self-attractiveness (Crouch and Degelman 1998), weight-related anxieties (Posavec and Posavec 2002; Dittmar and Howard 2004; Halliwell and Dittmar 2004; Brown and Dittmar 2005), appearance self-esteem (Martin et al. 2007), and body-image state (D’Alessandro and Chitty 2011; Diedrichs and Lee 2011). Wan et al. (2013) found that the effect of exposure to slim body images on self-evaluations was only negative when the exposure was “subtle,” i.e., when consumers were not requested to intensely think about the attractiveness of the model (which matches advertising practice). In recent studies, a null effect of model slimness on the perceivers’ self-esteem was also occasionally reported. For instance,
Halliwell et al. (2005) compared slim to average-sized models and found no effect on body-focused anxiety, especially in young females with a history of eating disorders. Bissell and Rusk (2010) created ads versions promoting lingerie products that differed with respect to the body size of the models (ranging from slim to heavy). They found that the perceived discrepancy between the actual and ideal selves of young women was not contingent on whether the model looked like an average-sized person (such as a Dove cosmetics model) or like a slim model. Similarly, Borau and Bonnefon (2017) did not find an effect of model body size on consumer body anxiety. However, there are also recent findings from experiments indicating that images of slim models used in advertisements produce greater body dissatisfaction (Yu 2014). In summary, with the exception of a few studies, there is strong evidence for the presumption of body dissatisfaction of an average-sized consumer viewing slim models. We test the following:

H2b: The slimmer the model, the lower is appearance self-esteem in average-sized consumers.

3.2.3. Effect of appearance self-esteem on product evaluations

Especially for fashion-related clothing that is offered in online shops, the effect of appearance self-esteem on product evaluations is relatively obvious. Consumers with high body dissatisfaction have stronger concerns with the fit and size of garments offered online, which likely lowers the intent to purchase such items on the Internet (Rosa at al. 2006; Kim and Damhorst 2010). However, for conditions that differ from online purchases, the question about whether concerns about one’s own body size induced by slim advertising models spill over negatively onto product evaluations rarely has been asked. In the context of model slimmness, Borau and Bonnefon (2017, p. 461) argued that “ads that evoke improved affective states commonly result in better advertising performance” (meaning that reduced self-esteem due to viewing slim models creates negative affective states that deteriorate evaluations). In an empirical study, Yu (2014) found that the model’s body size has a direct negative effect on body dissatisfaction (the slimmer the model, the higher was body dissatisfaction) and a negative effect on purchase intent (via attitude toward the ad); however, there was no effect of body dissatisfaction on product evaluations. As a reason for this unexpected finding, Yu argues that “that participants’ body dissatisfaction after exposure to thin-idealized models was not sufficiently strong enough to negatively influence their attitudes toward the ads or purchase intention” (p. 166). Borau and Bonnefon (2017) even found a positive effect of body anxiety on product evaluations, something the authors described as a surprising result; unfortunately, they did not provide any explanations for this unexpected finding. However, because prior research found that exposure to slim models impairs consumers’ mood and makes them envious and angry (e.g., Pinhas et al. 1999), one might expect that negative mood and negative feelings explain why a reduction in appearance self-esteem deteriorates product evaluations. We test the following:

H2c: Impaired appearance self-esteem negatively influences product evaluations.

3.2.4. Moderating role of general self-esteem

Individuals differ with respect to general self-esteem and self-confidence. Thus, the effect of model slimmness on appearance self-esteem might be shaped by general self-esteem. Jones and Buckingham (2005) presented either the depiction of a very unattractive or the image of a very attractive female person to female students. The attractive image improved body esteem in participants with high general self-esteem and impaired body esteem in participants with low general self-esteem. The same pattern of results was observed by Wilcox and Laird (2000). They found that women who scored high on a general self-esteem scale were “more confident about their own weight” after they had viewed slim models (compared to seeing heavy models). In contrast, women with a low level of general self-esteem were “much less content with their weight” after they had viewed pictures of slim models (compared to watching heavy models). Thus, a high level of general self-esteem might prevent consumers from developing negative appearance self-esteem in response to slim models. We test the following:

H2d: The negative effect of model slimmness on appearance self-esteem (as postulated in H2b) is stronger for consumers with low general self-esteem when we control for the effect of model attractiveness on appearance self-esteem.

3.3. Perceptions of model-self similarity as a mediator between model body size and product evaluations

People develop perceptions about overall similarity between the own person and another person if they receive particular pieces of information about this person. Arguments that can be used as reasons that people have an intrinsic need to create similarity perceptions can be found in social-identity theory (Tajfel 1974; 1978; 1982). From a very young age, people define themselves as members of social groups they belong to or want to belong to (in-groups) and of social groups they do not belong to or do not want to belong to (out-groups). Due to this basic need, people have a desire to classify unknown others into such groups. To be able to perform this task, people have to judge similarity and thus are prone to use each piece of information to build such similarity perceptions.

3.3.1. Effect of model body size on model-self similarity

Researchers who studied the development of similarity perceptions in response to contact with unknown others suggest that perceivers initially focus on so-called “first
3.3.2. Effect of model-self similarity on product evaluations

As an argument in favor of the positive effect of perceptions of overall model-self similarity on product evaluations, Aaker et al. (2000) stated that individuals infer from superficial similarity perceptions with respect to another person that their own tastes and preferences are also similar to this person. Moreover, they likely develop beliefs that they belong to the intended target group of the advertiser. Prior research found that felt targetness leads to a favorable attitude toward the promoted product (Debevec and Iyer 1988). Martin et al. (2007) argued and provided evidence for the presumption that perceived similarity (based on comparisons of body size) is associated with a process of self-referencing. Self-referencing is defined as the process by which a consumer relates message information to her or his self-structure (p. 200). Yu et al. (2014) found a positive effect of similarity on product evaluations. Thus, we surmise that model-self similarity with respect to body size is a rather effective factor because perceivers do not have much possibility to modify or cognitively control the effect of this impression. We test the following:

H3b: Perceptions of model-self similarity spill over positively onto product evaluations.

3.3.3. Moderating role of the consumer’s body size

Consistent with other researchers, we surmise that heavy consumers have a biased perception of their body weight or believe that their weight is malleable. They might perceive their body size as normal or average, while their BMI tells a different story. This argument is consistent with the proposition of Rudman et al. (2001), who argued that there is a “tendency to associate self with desirable traits.” Chinelli and Yang (2016) exposed heavy female consumers to an advertisement showing a heavy female model. These authors found for heavy models that “even when their body size is objectively similar to that of the model” (p. 471), heavy consumers regard their weight as malleable and thus do not strongly consider the similarity factor. Thus, we expect the following:

H3c: Unlike slim and average-sized consumers, heavy consumers have a biased perception of their body size; they believe they have highest similarity to average-sized models.

3.4. Tested model

The model depicted in Fig. 1 summarizes our hypotheses.

4. Overviews of the studies

Obviously, testing this model requires a large sample size because we consider model body size, consumer body size, general self-esteem, and the appearance-relatedness.
of the promoted product as factors. Thus, we decided to test different parts of the model in four studies. In Tab. 2, we present a chart containing x-symbols that indicate the hypotheses that are tested in each of the studies.

In Study 1, we test an often-discussed relationship – the effect of model body size on perceptions of model attractiveness. We perform this test because there are no clear findings in previous research. For instance, D’Alessandro and Chitty (2011) stated that model body size and model attractiveness are two distinct factors that could and should be manipulated independently (i.e., used as two independent variables in experiments) to examine the effect of model body size. In contrast, if there is a very strong relationship between these two concepts (e.g., Roozen and Adams 2011; Borau and Bonnefon 2017), model attractiveness should rather be considered a variable that mediates the effect of model body size on product evaluations. We adopt the second position and believe that model slimness is a perceptual concept that is recognized more easily (because it is one-dimensional) than is model attractiveness. Thus, we posit and test that slimness likely affects attractiveness. Study 1 investigates the validity of H1a in a non-advertising context.

In Study 2, we use an advertising context and test the role of model attractiveness and appearance self-esteem for the relationship between model body size and product evaluations. In contrast to the findings of other researchers stating that a decrease in appearance self-esteem due to watching a slim model cannot be strong enough to affect product evaluations negatively (e.g., Yu 2014; Borau and Bonnefon 2017), we test whether there is indeed a negative effect of impaired appearance self-esteem. Moreover, we look at the moderating role of general self-esteem.

Study 3 differs from Study 2 in that we do not test the role of general appearance self-esteem again but consider the role of model-self similarity in the segment of average-sized consumers. We conducted different studies (Study 2 and Study 3) to reduce the number of statements test participants had to agree or disagree with.

In Studies 1 to 3, responses of average-sized consumers to models are investigated using model body size as the experimental factor. In Study 4, we investigate whether the consumers’ own body size shapes the effect of model body size on product evaluations and focus on perceptions of model-self similarity.

5. Study 1: The effect of model body size on model attractiveness

We chose 36 portrayals of real, young, female persons who were dressed similarly in a black dress but, at first glance, differed regarding their body size. The dress of the females was tight on their bodies; thus, perceivers should be able to validly judge the person’s body size. The background of the photos was a neutral white or gray color.
We asked a sample of 124 female average-sized students to evaluate the depicted persons’ body size and their physical attractiveness. Data were collected with the help of four interviewers (female students) on the campus of a university. They were instructed to distribute the questionnaire to other female students with average body size only. They also received information that body mass index was relevant for judging the body size of the test participants and an adequate explanation of this index, i.e., the body mass index classification according to WHO (Seidell and Flegal 1997). The test participants reported their weight and height. Thus, the interviewers could check whether the test participants were slim, average-sized, or heavy. We also calculated the BMI based on the participants’ information and did not have to remove persons from the sample; all test participants were in the “average range” (18.5 < BMI ≤ 25). Each test participant evaluated seven or eight models in a randomized order. They had to evaluate the model’s body size on an 11-point scale (−5 = very underweight to +5 = very overweight) and her attractiveness (−5 = very unattractive to +5 = very attractive). Based on a meta-analysis, Feingold (1992) reported that attractiveness is mostly assessed by a single-item measure; we adopted this type of measure. A sample of nine of the 36 models, the average ratings of model body size and the average ratings of attractiveness are contained in the upper part of Fig 2.

This procedure was replicated to evaluate male models. We chose 22 male models dressed in a black suit. The interviewers (male students) were requested to select average-sized male students and to ask the students to judge the body size and physical attractiveness of the models. Overall, 105 male students were allocated to three subsamples. Each of the 22 models was rated by 35 students (each student rated seven or eight models). In the lower part of Fig. 2, we show a sample of the motifs and the judgments of body size and attractiveness.

From verbal comments of test participants, we conclude that none of the chosen models had been judged “too thin,” with the result of unfavorable attractiveness evaluations, or as “artificially modified” by image-editing software. Moreover, no-one indicated they were unable to recognize the model’s body size. We found that young females (and males) with average body size relied on other’s body size to judge this person’s physical attractiveness. When we correlated the mean values of model body size and model attractiveness, the relationship was strongly negative; for female perceivers who judged female models, $r = -0.93$ ($N = 36$ female models), and for male perceivers who evaluated male models, $r = -0.85$ ($N = 22$ male models). The relationships are depicted in Fig. 3. Regression analyses, which included a squared term for the slimness factor (see dotted lines in Fig. 3), showed that heavy models were evaluated rather negatively by average-sized female persons, resulting in a slightly concave relationship. We conclude that model attractiveness should be considered a mediating variable in the relationship between model body size and product evaluations and should not be considered a control variable when investigating the model-body-size effect on product evaluations. The findings strongly support H1a.
Average-sized female persons evaluate female models
Average-sized male persons evaluate male models


6.1. Experimental design
We used students with average-sized bodies as test participants and conducted an experiment that was based on a 3 (body size of the advertising model: slim, average, or heavy) × 2 (type of product category: appearance-related or appearance-unrelated) × 2 (consumer gender: female or male) between-subjects design. The model’s body size served as a factor that was manipulated experimentally. Consumer gender was included to check whether the findings are generalizable across gender. The appearance-relatedness of the product was considered a potentially moderating variable. Additionally, general self-esteem was included as a factor that was assessed ex-post by categorizing data. We only used advertising models who had the same gender as the respective test participants, i.e., we did not expose female consumers to advertisements that depicted male models and vice versa.

6.2. Manipulation of the appearance-relatedness of product categories
We conducted a pre-test to identify product categories that either are or are not highly related to an individual’s physical appearance (i.e., are helpful to increase one’s attractiveness). To be more precise, we focused on products that are or are not attractiveness-enhancing (Bower and Landreth 2001; Tampe et al. 2010). We exposed a sample of 60 female and 60 male students to a list of product categories and asked them to check whether products from these categories are relevant for enhancing their physical appearance. Thirty persons of each gender evaluated five selected products; a further 30 persons of each gender evaluated the five other products by responding to “The use of ... will greatly increase my attractiveness” (1 = totally disagree, 7 = totally agree). The results are shown in Tab. 3. As an appearance-related product, we selected the perfume. As an appearance-unrelated product, we selected the digital camera.

6.3. Test stimuli
For each of the selected categories (perfume and digital camera), we created three versions of a print ad that differed regarding the body size of the depicted model. The models were selected according to the findings of Study 1. One model was rated as rather slim in Study 1, another model’s body size as average, and a further model was judged heavy. The advertisements contained a picture of the model, the image of the promoted product, and a short slogan. We used the following brands: Lacoste for the perfume and Leica for the digital camera. Fig. 4 shows the ads promoting the perfume. In the ads for the camera, the same models, an image of the camera, and a background image were depicted. Moreover, a slogan

<table>
<thead>
<tr>
<th>Product Category</th>
<th>Female persons</th>
<th>Male persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perfume</td>
<td>6.26</td>
<td>5.17</td>
</tr>
<tr>
<td>Shampoo</td>
<td>5.77</td>
<td>4.71</td>
</tr>
<tr>
<td>Wristwatch</td>
<td>5.20</td>
<td>4.68</td>
</tr>
<tr>
<td>Body lotion</td>
<td>5.10</td>
<td>3.71</td>
</tr>
<tr>
<td>Makeup</td>
<td>5.26</td>
<td>3.08</td>
</tr>
<tr>
<td>Mineral water</td>
<td>4.01</td>
<td>3.57</td>
</tr>
<tr>
<td>Contract for a mobile phone</td>
<td>2.32</td>
<td>2.17</td>
</tr>
<tr>
<td>Laptop computer</td>
<td>2.77</td>
<td>3.09</td>
</tr>
<tr>
<td>Digital camera</td>
<td>2.61</td>
<td>1.72</td>
</tr>
<tr>
<td>Tissue</td>
<td>1.99</td>
<td>1.34</td>
</tr>
</tbody>
</table>

Note: Scale ranges from 1 (low) to 7 (high relatedness of the category to one’s appearance)

Tab. 3: Pretest results regarding the appearance-relatedness of product categories

Fig. 3: Relationship between model body size and model attractiveness (Study 1)
was inserted. Thus, the camera ads were composed similarly to the perfume ad versions.

6.4. Procedure

Data were collected face-to-face with the help of student interviewers. We did not use an online survey because, in this case, we could not ensure that only average-sized persons took part in the investigations. First, the test participants indicated their general self-esteem. Then, they were exposed to one ad version and could view it as long as they wished. Subsequently, the respondents had to evaluate the promoted product, rate the model’s attractiveness, and report their appearance self-esteem. Finally, the respondents indicated how often they bought or use products from the respective categories and noted demographic data, weight, and height. The latter two variables were used to check whether the body mass index was in fact in the average range, i.e., \(18.5 < \text{BMI} \leq 25\). There were no significant differences in usage frequency or demographic data across the experimental conditions. Except for gender, age, weight, and height, all scales were seven-point scales.

6.5. Measurement

We assessed general self-esteem in the sense of a personality trait and adopted the statements from the scale developed by Heatherton and Polivy (1991) that are not related to one’s appearance. The statements are as follows (R indicates reverse scoring, i.e., we reversed the values when calculating the composite score): 1. “I feel confident about my abilities”; 2. “I am worried about whether I am regarded as a success or failure” (R); 3. “I feel frustrated or rattled about my performance” (R); 4. “I feel that I am having trouble understanding things that I read” (R); 5. “I feel that others respect and admire me”; 6. “I feel self-conscious”; 7. “I feel as smart as others”; 8. “I feel displeased with myself” (R); 9. “I feel good about myself”; 10. “I am worried about what other people think of me” (R); 11. “I feel confident that I understand things”; 12. “I feel inferior to others” (R); 13. “I feel concerned about the impression I am making” (R); 14. “I feel that I have less scholastic ability right now than others” (R); 15. “I feel like I’m not doing well” (R); and 16. “I am worried about looking foolish” (R). Cronbach’s Alpha for the general self-esteem scale was .748.

We asked test participants to evaluate the advertised product by agreeing or disagreeing with “appealing,” “attractive,” and “likeable” (Cronbach’s Alpha = .902). To measure the model’s attractiveness, test participants agreed or disagreed with “The depicted model is physically very attractive” and “The model is very good-looking” \((r = .742)\). Ohanian (1990) used similar items to measure model attractiveness. To assess the test person’s current appearance self-esteem, i.e., for body-related self-esteem in this special moment, we also adopted statements from a scale of Heatherton and Polivy (1991) that are related to one’s physical appearance. We asked test participants to rate themselves by agreeing or disagreeing with the following statements: 1. “I feel satisfied with the way my body looks right now”; 2. “Right now, I am dissatisfied with my weight” (R); 3. “Right now, I feel unattractive” (R); and 4. “I am pleased with my appearance right now” (Cronbach’s Alpha = .789).

6.6. Sample

In total, 363 students took part in this study. The interviewers were instructed to contact average-sized students on the campus of a university in Germany. Respondents
reported their weight (overall: $M_{\text{weight}} = 68.31$ kg, $SD = 13.81$; $M_{\text{weight, females}} = 61.39$ kg, $M_{\text{weight, males}} = 76.24$ kg) and height. Based on this information, we calculated the body mass index for each test participant and found $M_{\text{BMI}} = 21.60$ ($SD = 3.78$). This finding is in the normal BMI range. All test participants could be classified as consumers with “average” body size ($18.5 < \text{BMI} \leq 25$). On average, participants were 23.55 years old ($SD = 2.68$). The average number of persons per experimental condition was 30.9. Approximately one-half of the participants were female students (53.4%).

6.7. Description of results

We calculated the mean values of product evaluations, model attractiveness, and appearance self-esteem to gain insights into the effects of model body size. The findings are summarized in Tab. 4 [1]. The main effect of model body size revealed an inverted U-shaped relationship between model body size and product evaluations (note that the sample consists of consumers with average body size only). In total, product evaluations were as follows: $M_{\text{slim model}} = 4.22$, $M_{\text{average model}} = 5.07$, and $M_{\text{heavy model}} = 4.14$; $\eta^2 = .090$. Thus, the effect size is rather small. Moreover, the findings indicate a decrease of model attractiveness with increasing model body size and an increase of test participants’ appearance self-esteem with increasing model body size.

6.8. Test of the hypotheses

6.8.1. Preceding analyses

A closer look at the data and ANOVA results (Tab. 5) showed that the effect of model body size on product evaluations, model attractiveness, and appearance self-esteem was contingent on neither consumer gender nor product category (the category had a main effect on

<table>
<thead>
<tr>
<th>Response variable</th>
<th>Consumer gender</th>
<th>Product category</th>
<th>Sample size</th>
<th>Model body size</th>
<th>ANOVA F (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Slim</td>
<td>Average</td>
</tr>
<tr>
<td>Product evaluations</td>
<td>Female</td>
<td>Digital camera</td>
<td>90</td>
<td>3.86 (1.36)$a$</td>
<td>4.64 (1.08)$b$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Perfume</td>
<td>90</td>
<td>4.73 (1.74)$a$</td>
<td>5.43 (1.05)$b$</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>Digital camera</td>
<td>93</td>
<td>4.14 (1.26)$a$</td>
<td>5.27 (1.19)$b$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Perfume</td>
<td>90</td>
<td>4.24 (1.24)$a$</td>
<td>4.86 (1.80)$ab$</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td></td>
<td>363</td>
<td>4.22 (1.43)$a$</td>
<td>5.07 (1.01)$b$</td>
</tr>
<tr>
<td>Model attractiveness</td>
<td>Female</td>
<td>Digital camera</td>
<td>90</td>
<td>4.07 (.73)$a$</td>
<td>3.34 (.73)$ab$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Perfume</td>
<td>90</td>
<td>4.32 (1.12)$a$</td>
<td>3.68 (.75)$b$</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>Digital camera</td>
<td>93</td>
<td>4.60 (1.22)$a$</td>
<td>3.58 (.70)$b$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Perfume</td>
<td>90</td>
<td>4.32 (1.38)$a$</td>
<td>3.82 (.70)$b$</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td></td>
<td>363</td>
<td>4.32 (1.13)$a$</td>
<td>3.62 (1.02)$b$</td>
</tr>
<tr>
<td>Appearance self esteem</td>
<td>Female</td>
<td>Digital camera</td>
<td>90</td>
<td>4.08 (1.95)$a$</td>
<td>4.84 (1.80)$ab$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Perfume</td>
<td>90</td>
<td>4.20 (.96)$a$</td>
<td>5.00 (1.39)$b$</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>Digital camera</td>
<td>93</td>
<td>4.80 (2.08)$a$</td>
<td>5.33 (1.67)$b$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Perfume</td>
<td>90</td>
<td>4.40 (2.16)$a$</td>
<td>5.23 (1.28)$ab$</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td></td>
<td>363</td>
<td>4.37 (1.87)$a$</td>
<td>5.11 (1.53)$b$</td>
</tr>
</tbody>
</table>

Notes: Scale ranges from 1 (negative) to 7 (positive). Data are mean values; standard deviation in parentheses. Mean values in the same line with different subscripts are different at the .05 level (Scheffé-Test).

Tab. 5: ANOVA results of Study 2

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Degrees of freedom</th>
<th>Product evaluations</th>
<th>Model attractiveness</th>
<th>Appearance self esteem</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>numerator</td>
<td>denominator</td>
<td>F-value</td>
<td>p-value</td>
</tr>
<tr>
<td>Product category</td>
<td>1</td>
<td>351</td>
<td>6.073</td>
<td>.014</td>
</tr>
<tr>
<td>Gender</td>
<td>1</td>
<td>351</td>
<td>2.506</td>
<td>.114</td>
</tr>
<tr>
<td>Model body size</td>
<td>2</td>
<td>351</td>
<td>19.769</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Product category × Gender</td>
<td>1</td>
<td>351</td>
<td>12.844</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Category × Model body size</td>
<td>2</td>
<td>351</td>
<td>.487</td>
<td>.615</td>
</tr>
<tr>
<td>Gender × Model body size</td>
<td>2</td>
<td>351</td>
<td>1.664</td>
<td>.191</td>
</tr>
<tr>
<td>Category × Gender × M. size</td>
<td>2</td>
<td>351</td>
<td>.302</td>
<td>.740</td>
</tr>
</tbody>
</table>

Tab. 4: Effect of model body size on product evaluations, model attractiveness, and appearance self-esteem (Study 2)
product evaluations, which is not of interest here). Because there were no significant interaction effects between consumer gender and the other factors on product evaluations, we collapsed the data across genders and products.

In our statistical model, which was subsequently used to estimate effects, we included model attractiveness and appearance self-esteem as mediating variables. Both mediating variables were expected to be affected by the same independent variable – model body size. Thus, there would be a correlation between the mediating variables. Preacher and Hayes (2008, p. 887) recommend that users of multi-mediation models focus on the fact that the mediating variables are correlated. They suggest selecting “mediators that represent unique constructs with as little conceptual overlap as possible.” We presume that perceptions of model attractiveness and one’s own appearance self-esteem are distinct concepts from a theoretical point of view. This distinction is consistent with the work of numerous researchers in this field (e.g., Richins 1991). From the statistical point of view, the correlation between model attractiveness and appearance self-esteem (calculated as average scores) is -.165 (p = .002). For findings about the discriminant validity, see [2].

6.8.2. Estimating a statistical model

Because our independent variable (model body size) had three levels (slim, average, and heavy), we calculated two binary variables. We defined them as follows: $d_1 = 1$ (average-sized model), 0 (else); $d_2 = 1$ (heavy model), 0 (else). Thus, the slim-model condition served as the reference standard. We included model attractiveness and appearance self-esteem as mediating variables. We used product evaluations as the dependent variable. Thus, we have one independent variable expressed by two binary variables, one dependent variable, and two mediating variables.

In the first step, we did not consider the moderating variables assessed in this study and considered in our model (appearance-relatedness of the product category, general appearance self-esteem), instead focusing on the mediating variables. We estimated the coefficients with the help of the statistical model is consistent with this presumption $b_{attractiveness \rightarrow evaluations} = .38, p < .001$.

6.8.3. Results of the tests

In H1a, we postulated a positive effect of model slimness on model attractiveness. This effect is reflected by the mean values contained in Tab. 4 (model attractiveness: $M_{slim model} = 4.32, M_{average model} = 3.62, M_{heavy model} = 3.14$). The slimmer the model, the higher is the model’s attractiveness. The difference in model attractiveness between the average-sized and the slim-model condition equals $b_{d_1 \rightarrow attractiveness} = -.71 (p < .001)$; the difference between the heavy-model and the slim-model condition is $b_{d_2 \rightarrow attractiveness} = -1.19 (p < .001)$. These findings support H1a.

In H1b, we presumed that product evaluations are positively affected by model attractiveness. The estimate of the statistical model is consistent with this presumption $b_{attractiveness \rightarrow evaluations} = .38, p < .001$. 

https://doi.org/10.15358/0344-1369-2019-3-3

Generiert durch IP "54.70.46.11", am 21.05.2021, 07:24:53.

Das Erstellen und Weitergeben von Kopien dieses PDFs ist nicht zulässig.
Hypothesis Effect Estimate t-value p-value
Effect of model body-size on attractiveness (H1a) $b_{d1}$ → attractiveness -0.71 -5.11 <.001
Effect of model body-size on product evaluations (H1b) $b_{attractiveness}$ → evaluations .38 6.20 <.001
Effect of model attractiveness on appearance self-esteem (H2a) $b_{attractiveness}$ → appearance self-esteem -0.38 -6.17 <.001
Effect of model size on appearance self-esteem (while controlling for the effect via model attractiveness) (H2b) $b_{d1}$ → appearance self-esteem .47 3.34 <.001
$E_{d2}$ → appearance self-esteem .73 5.00 <.001
Effect of appearance self-esteem on product evaluations (H2c) $b_{appearance self-esteem}$ → evaluations -.05 -.27 ns

Notes: Definition of the binary variables: $d1=1$ (average-sized model), 0 (else); $d2=1$ (heavy model), 0 (else).

The symbol $\Delta$ indicates the difference between the two parameter estimates listed above.

Confidence intervals of the estimates can be calculated by $b \pm z(1-\alpha/2)s_b$ with $s_b = s/\sqrt{n}$.

Tab. 6: Results of the application of a Hayes procedure to test the effects of model attractiveness and appearance self-esteem on product evaluations (Study 2)

H1c stated that the effect of model attractiveness on product evaluations is stronger for highly appearance-related products (here: perfume) than for less appearance-related products (here: digital camera). In terms of the statistical model, $b_{attractiveness}$ → evaluations is expected to be higher for perfume than for digital camera. As estimates, we received $b_{attractiveness}$ → evaluationsperfume = .53 ($SE = .084$) and $b_{attractiveness}$ → evaluationsdigital camera = .33 ($SE = .088$). The difference, which reflects the effect of the moderating variable, equals $.20 (t = .20/(.082^2+.088^2)^{.5} = 1.67, p < .05)$ and provides support to H1c.

In H2a, we expected that model attractiveness would have a negative effect on appearance self-esteem. This effect is represented by $b_{attractiveness}$ → appearance self-esteem = -0.38 ($p < .001$). It could be interpreted in the sense of a negative regression slope between these variables and is consistent with H2a.

In H2b, we postulated a direct effect of model body size on appearance self-esteem. The total effect of model body size on appearance self-esteem is mirrored by the mean values contained in Table 4 (appearance self-esteem: $M_{\text{slim model}} = 4.37, M_{\text{average model}} = 5.11, M_{\text{heavy model}} = 5.55$).

The slimmer the model, the lower is the perceiver’s appearance self-esteem. First, we compared the average-sized-model to the slim-model condition. The statistical procedure of Hayes model 6 divides the total difference $M_{\text{average model}} - M_{\text{slim model}} = 5.11 - 4.37 = .74$ into two partial effects: the indirect effect via model attractiveness ($b_{d1}$ → attractiveness × $b_{attractiveness}$ → appearance self-esteem = -.71 × -0.38 = .27) and the remaining direct effect while controlling for the effect via model attractiveness ($b_{d1}$ → appearance self-esteem = .47, $.p < .001$). Second, we compared the heavy-model to the slim-model condition. The total difference in appearance self-esteem in the heavy-model compared to the slim-model condition ($M_{\text{heavy model}} - M_{\text{slim model}} = 5.55 - 4.37 = 1.18$) is analogously composed of the indirect effect via attractiveness ($b_{d2}$ → attractiveness × $b_{attractiveness}$ → appearance self-esteem = -1.19 × -.38 = .45) and the remaining direct effect $b_{d2}$ → appearance self-esteem = .73 ($p < .001$). The findings about the remaining direct effects of model slimmness on appearance self-esteem have to be used for testing H2b. They are consistent with this presumption.

H2c stated a positive effect of appearance self-esteem on product evaluations. In contrast to this presumption, this effect is nonsignificant ($b_{appearance self-esteem}$ → evaluations = -.05).
H2d presumed that general self-esteem shapes the relationship between model body size and appearance self-esteem. For the total sample, \( b_{d1} \rightarrow \text{appearance self-esteem} \) is .47 and \( b_{d2} \rightarrow \text{appearance self-esteem} \) equals .73. Dividing the total sample into two subsamples (median split of general self-esteem; for a discussion of splitting continuous data into two levels, see McClelland et al. 2015) and estimating the statistical model for both conditions (low vs. high general self-esteem) results in estimates of both parameters depending on the level of general self-esteem. The findings show that model body size affects appearance self-esteem in consumers with low general self-esteem (\( b_{d1} \rightarrow \text{appearance self-esteem|low general self-esteem} = .85 \) and \( b_{d2} \rightarrow \text{appearance self-esteem|low general self-esteem} = .09 \) and \( b_{d2} \rightarrow \text{appearance self-esteem|high general self-esteem} = .07 \), n.s.). The difference in these effects across general self-esteem is significant, which provides support to H2d.

### 6.8.4. Supplementary analysis about the interaction effect of model body size and general self-esteem

In the previous section, we used a dichotomized variable for general self-esteem (as a personality trait) to assess its moderating effect on the relationship between model body size and appearance self-esteem. However, in our study, general self-esteem was measured with the means of a continuous scale. Therefore, one might suspect that using the median split for general self-esteem could not provide the complete insight into the interaction effect of model body size and general appearance self-esteem.

In the first step, we calculated the mean values of appearance self-esteem depending on the body size of the depicted model (with three levels: slim, average-sized, and heavy) and three levels of general self-esteem. The findings are reported in Tab. 7.

The results of a two-way ANOVA indicate that appearance self-esteem increases with general self-esteem \( (F_{2,354} = 172.154, p < .001) \) and decreases with model body size \( (F_{2,354} = 22.030, p < .001) \). There is an interaction effect \( (F_{2,354} = 11.542, p < .001) \). Post-hoc tests indicate that model body size has only a negative effect on appearance self-esteem when general self-esteem is low (scale values of general self-esteem ≤ 3; \( p < .001 \)).

In the second step, we used an alternative method to gain insights into the interaction effect and conducted floodlight analyses (Spiller et al. 2013), which visualize the results of the Johnson-Neyman technique.

What is the Johnson-Neyman technique? This procedure has its origin in the field of regression analysis (i.e., econometrics) and has been rarely used in experimental consumer research thus far. However, because Hayes (2017) included this method to his procedures, authors in the field of experimental consumer research started to use it to analyze empirical data (e.g., Li et al. 2019). Thus, we start with a brief description of this technique. In the simplest case in which the Johnson-Neyman technique could be used, there is one independent variable X (continuous variable), one dependent variable Y (continuous variable), and one moderating variable M (categorical variable with two levels \( m = 1 \) and \( m = 2 \)). Then, two regression equations can be estimated, one for \( m = 1 \) and one for \( m = 2 \). Johnson and Neyman (1936) and Johnson and Fay (1950) suggested separating regions of nonsignificant difference from regions of significant difference between the predicted values of \( Y_{(m=1)} \) and \( Y_{(m=2)} \) depending on the value x of the independent variable X. There is no Johnson-Neyman test which could be applied to provide evidence for a hypothesis or to reject this hypothesis; instead, Johnson and Neyman suggested a technique suitable to identify “regions of significance.” The appropriate version of this technique how to find the region of significance is contingent on a large set of assumptions; thus, there is also no standard procedure that could be applied. In the following, we show how the Johnson-Neyman technique could be used in the simplest case in which there are two regression equations which both perfectly meet the OLS (ordinary least-squares linear regression) assumptions and in which data come from two independent samples. First, assume a linear relationship between X and Y for both levels of M, i.e., for \( m = 1 \) and \( m = 2 \):

\[
y_{(m)} = \beta_{0(m)} + \beta_{1(m)} x + u_{(m)} \text{ or } \tilde{y}_{(m)} = b_{0(m)} + b_{1(m)} x
\]

Second, assume normally distributed error terms \( U_{(1)} \sim N(0,\sigma_{1}^{2}) \) and \( U_{(2)} \sim N(0,\sigma_{2}^{2}) \) for each value x of X and uncorrelated error terms, i.e., that, for both regression equations, all assumptions of the OLS estimation are fully met. Third, assume that data for both conditions (i.e., \( m = 1 \) and \( m = 2 \)) come from two independent samples.

### Supplementary Analysis about the Interaction Effect of Model Body Size and General Self-Esteem

<table>
<thead>
<tr>
<th>General self-esteem</th>
<th>Sample size</th>
<th>Model body size</th>
<th>ANOVA F (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Slim</td>
<td>Average</td>
</tr>
<tr>
<td>Scale value ≤ 3</td>
<td>108</td>
<td>2.51 (.125)</td>
<td>3.94 (.54)</td>
</tr>
<tr>
<td>3 &lt; scale value ≤ 5</td>
<td>80</td>
<td>4.33 (.48)</td>
<td>4.62 (.68)</td>
</tr>
<tr>
<td>Scale value ≥ 5</td>
<td>175</td>
<td>5.93 (.115)</td>
<td>6.15 (.12)</td>
</tr>
<tr>
<td>Total</td>
<td>363</td>
<td>4.37 (1.87)</td>
<td>5.11 (1.53)</td>
</tr>
</tbody>
</table>

Notes: Scale ranges from 1 (low) to 7 (high appearance self-esteem).
Minimum cell size: \( n = 25 \).
Mean values in the same line with different subscripts are different at the .05 level (Scheffé-Test).
Then, the difference $D = \hat{y}_{(2)} - \hat{y}_{(1)}$ is normally distributed with the expected value

$$E(D) = (\beta_{(0,2)} + \beta_{(2,2)}x) - (\beta_{(0,1)} + \beta_{(1,1)}x)$$

and the variance

$$Var(D) = Var(\hat{y}_{(2)}) + Var(\hat{y}_{(1)})$$

The so-called Johnson-Neyman point separates ranges of $X$ with significant difference between $\hat{y}_{(2)}$ and $\hat{y}_{(1)}$, from ranges of $X$ with nonsignificant difference between $\hat{y}_{(2)}$ and $\hat{y}_{(1)}$. Such points have to meet the following requirement: $|z| > z(1-\alpha)$. The significance level is expressed by $\alpha$. Under the assumptions described above, $z$, which is a function of $x$, is calculated as follows:

$$z = [(\hat{y}_{(2)} - \hat{y}_{(1)}) - 0]/(s_{\hat{y}_{(2)}} + s_{\hat{y}_{(1)}})^{0.5}$$

The estimates of the squared standard errors of $\hat{y}_{(m)}$ equal

$$s^2_{\hat{y}_{(m)}} = s^2_{\hat{y}_{(m)}} \left[ \frac{1}{n_{(m)}} + \frac{(x - \bar{x}_{(m)})^2}{(n_{(m)} - 1)s^2_{\bar{x}_{(m)}}} \right]$$

for $m = 1$ and $m = 2$ (for of the estimated variance of $\hat{y}$ under OLS assumption, see Stewart and Wallis 1981, p. 127). There are many suggestions in mathematical statistics about how to modify the calculations for the Johnson-Neyman technique when researchers have reasons to make different assumptions than OLS assumptions (e.g., Miyazaki and Maier 2005; Lazar and Zerbe 2011), when the levels of the moderating variable $M$ come from a within-subject design (e.g., Rogosa 1981; Johnson 2016), when the number of the levels of $M$ is higher than two (e.g., Potthoff 1964), or when there is a higher number of dependent variables (e.g., Abelson 1953). Further authors assume that Johnson-Neyman points are symmetrical regarding the intercept point (if any) of the regression equations (e.g., White 2003). Many authors provide software solutions for particular cases (e.g., Karpman 1983; Scialfa 1987; Kowalski et al. 1994; Hunka and Leighton 1997; D’Alonzo 2004; Lazar and Zerbe 2011; Carden et al. 2017; Hayes 2017).

Assumptions: To apply the Johnson-Neyman technique to our issue, we first have to modify our tested model shown in Fig. 1 as follows: We have to assume that the level of model body size ($M$) moderates the relationship between general self-esteem ($X$) and appearance self-esteem ($Y$) because this technique requires a continuous independent variable and a categorical moderating variable. We cannot use the Johnson-Neyman technique for investigating the effect of model body size on appearance self-esteem under the condition of general self-esteem as our model suggests because the quality of our scales inhibits us from doing so. Second, we have to assume that we have enough data for each region of the $X$ variable to estimate stable regression equations. Third, OSL assumptions have to be made what allows us to use the simple formula given in the previous section.

Application: We apply this formula to our issue and assess the effect of general self-esteem ($X$) on appearance self-esteem ($Y$) under different levels of model body size ($M$). In Fig. 5, we show pairwise relationships and the Johnson-Neyman points.

![Fig. 5: Floodlight analysis to investigate the interaction effect between model body size and general self-esteem on appearance self-esteem](https://doi.org/10.15358/0344-1369-2019-3-3)
For the purpose of these calculations, we have applied the simplest version of regression analysis (OLS-estimates for simple linear regression models). Our calculations for the comparison of the average-sized-model condition to the heavy-model condition provided two Johnson-Neyman points. There is only significant difference between $\hat{y}_{12}$ and $\hat{y}_{11}$ in the region of $2.89 \leq \text{GSE} \leq 5.47$ but not in the region of $1 \leq \text{GSE} < 2.89$ for $\alpha = .05$. This phenomenon is due to the fact that, in this case, the difference between the predicted values of the dependent variable $\hat{y}_{12} - \hat{y}_{11}$ increases with decreasing GSE. Simultaneously, the standard error $\sigma_{y_{12}}$ of this difference is contingent on GSE and increases with the deviation of GSE from the mean values of GSE for both conditions.

Results: When we compare the slim-model condition to the average-sized-model condition, subjects with GSE $\leq 5.64$ are negatively affected ($p < .05$) by the presence of a slim model compared to contact with an average-sized model. When we contrast the slim-model condition to the heavy-model condition, consumers with a GSE-level already below 6.40 are negatively influenced regarding appearance self-esteem by the contact with an image of a slim model. For the comparison of the average-sized-model to the heavy-model condition, we found for 2.89 $\leq \text{GSE} \leq 5.47$, that a heavy model resulted in higher appearance self-esteem.

Interpretation of the interaction effect: The ANOVA results presented in this section indicated that model body size has only a negative effect on appearance self-esteem when general self-esteem is rather low (scale values of general self-esteem $\leq 3$). On the contrast, the floodlight analyses indicated that model body size has an effect on consumers’ appearance self-esteem even when their general self-esteem is rather high. We believe that the Johnson-Neyman technique has provided artificial results because our experiment did not aim to collect data for low and for high values of general self-esteem what results in unstable regression equations. Overall, we agree with researchers who state that the calculations of Johnson-Neyman points are “tedious” (D’Alonzo 2004) and results should be interpreted highly carefully due to the large number of assumptions which have to be made and requirements to data. Usually, experimental consumer research aims to collect data for a small number of conditions of experimental factors and is based on mean value comparisons; for the appropriate application of floodlight analysis which is regression-based, data have to be collected for a large number of conditions to cover the full range of the levels of the factor that is used as continuous variable. Thus, we rely more on “what data say” (i.e., mean comparisons and ANOVA results) than on the validity of the regression equations (i.e., the results of the floodlight analyses) and conclude that model body size affects appearance self-esteem only in consumers with a relatively low level of general self-esteem.

6.9. Interpretation

The tests provided evidence for all hypotheses, with one exception – our findings did not confirm to an effect of appearance self-esteem on product evaluations. H2c had to be rejected. In the following, we explain why this rejection happened. On the one hand, an inverted U-shaped relationship between model body size and product evaluations was found. On the other hand, we found a positive effect of model body size via model attractiveness (the slimmer the model, the higher was model attractiveness, and the higher were product evaluations), and we postulated a negative effect of model body size via appearance self-esteem on product evaluations (the slimmer the model, the lower is appearance self-esteem and the lower are product evaluations). Two variables for which linear effects are presumed cannot satisfactorily explain an inverted U-shaped relationship. We believe that the finding from previous research (null effect of appearance self-esteem, see D’Alessandro and Chitty 2011; Yu 2014) and the finding from Study 2 indicate that our estimates suffer from a misspecification of the statistical model. Most probably, an important variable is missing that could explain the inverted U-shaped relationship and whose inclusion might reveal a more valid picture of the role of appearance self-esteem. Thus, we included perceptions of model-self similarity into the study described in the next section.

7. Study 3: Investigating the role of model attractiveness, appearance self-esteem, and model-self similarity for average-sized consumers

Study 3 is a replication of Study 2 with modifications. We considered model-self similarity as an additional mediating variable. We used other products as test objects: hair shampoo as a representative of highly appearance-related products and tissues of the Tempo brand were used as the appearance-unrelated product. These categories were chosen in accordance with the pre-test results of Study 2 (see Tab. 3). We refrained from assessing and investigating general self-esteem in this study. The procedure was adopted from Study 2.

7.1. Experimental design

We again used students with average body size as test participants. We adopted the experimental design of Study 2, which was a 3 (body size of the advertising model: slim, average, or heavy) × 2 (type of product category: appearance-related or appearance-unrelated) × 2 (consumer gender: female or male) between subjects design. Consumer gender served as a factor to check the generalizability of the results. The manipulation of the model body size was done by means of print ad versions as was done in Study 2. Pantene Pro V brand shampoo was used as the appearance-related product, and tissues of the Tempo brand were used as the appearance-unrelated product.
7.2. Measurement and sample
We assessed perceptions of the similarity between the test person and the model by agreement with the following statements: “I find myself similar to this person” (adopted from Jones and Buckingham 2005) and “The depicted model and I have a lot of commonalities” (r = .761). For the other variables, the reliability measures were as follows: for product evaluations, Cronbach’s Alpha = .912; for current appearance self-esteem, Cronbach’s Alpha = .751; and for model attractiveness, r = .815. In total, 383 average-sized students participated in this study (51.2% female, M_age = 23.73 years, M_BMI = 21.32).

7.3. Description of results
Similarly to Study 2, the findings, which are reported in Tab. 8, showed an inverted U-shaped relationship between model body size and product evaluations (M_slim model = 3.72, M_average model = 4.56, and M_heavy model = 3.99; η² = .055). Appearance self-esteem increased with model heaviness, and model attractiveness increased with model slimness. Study 3 adds the finding that the perceptions of model-self similarity are highest for the average-sized models (note that we only used average-sized consumers as test participants).

7.4. Test of the hypotheses
7.4.1. Preceding analyses
A three-way ANOVA that included model body size, consumer gender, and the product category as factors and product evaluations as dependent variable did not reveal interaction effects of consumer gender (model body size × consumer gender F_{2,371} = 1.166, ns; model body size × consumer gender × product category F_{2,371} = 1.195, ns). Thus, we collapsed the data across the consumer gender factor.

The correlations between the mediating variables were as follows: r_{attractiveness, appearance self-esteem} = -.117, r_{attractiveness, similarity} = .412, and r_{appearance self-esteem, similarity} = .383, indicating weak or moderate correlations. The measures of the mediating variables possess discriminant validity [3].

7.4.2. Estimating a statistical model
We followed the recommendations of Hayes and Preacher (2014) on how to include a multicategorical independent variable. The independent binary variables were defined as follows: d1 = 1 if average-sized model, 0 else; and d2 = 1 if heavy model, 0 else. Model attractiveness, model-self similarity, and appearance self-esteem served as mediating variables. Because we intended to use a Hayes procedure to estimate the effects, we had to make

<table>
<thead>
<tr>
<th>Response variable</th>
<th>Consumer gender</th>
<th>Product category</th>
<th>Sample size</th>
<th>Model body size</th>
<th>ANOVA F (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Slim</td>
<td>Average</td>
</tr>
<tr>
<td>Product evaluations</td>
<td>Female</td>
<td>Tissues</td>
<td>90</td>
<td>4.43 (.88)</td>
<td>5.52 (1.23)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shampoo</td>
<td>96</td>
<td>3.42 (1.33)</td>
<td>4.05 (1.26)</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>Tissue</td>
<td>90</td>
<td>4.88 (1.50)</td>
<td>5.37 (.96)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shampoo</td>
<td>107</td>
<td>2.42 (1.23)</td>
<td>3.50 (1.38)</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td></td>
<td>383</td>
<td>3.72 (1.58)</td>
<td>4.56 (1.49)</td>
</tr>
<tr>
<td>Model attractiveness</td>
<td>Female</td>
<td>Tissue</td>
<td>90</td>
<td>4.33 (1.01)</td>
<td>3.73 (1.02)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shampoo</td>
<td>96</td>
<td>4.20 (.87)</td>
<td>3.81 (1.33)</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>Tissue</td>
<td>90</td>
<td>4.18 (1.37)</td>
<td>3.70 (.94)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shampoo</td>
<td>107</td>
<td>3.81 (.99)</td>
<td>3.69 (1.48)</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td></td>
<td>383</td>
<td>4.11 (.98)</td>
<td>3.73 (1.17)</td>
</tr>
<tr>
<td>Appearance self esteem</td>
<td>Female</td>
<td>Tissue</td>
<td>90</td>
<td>4.07 (1.61)</td>
<td>4.60 (2.09)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shampoo</td>
<td>96</td>
<td>4.06 (1.48)</td>
<td>4.97 (1.49)</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>Tissue</td>
<td>90</td>
<td>4.32 (1.77)</td>
<td>4.93 (2.13)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shampoo</td>
<td>107</td>
<td>4.61 (1.23)</td>
<td>5.02 (1.87)</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td></td>
<td>383</td>
<td>4.28 (1.72)</td>
<td>4.89 (1.89)</td>
</tr>
<tr>
<td>Model-self similarity</td>
<td>Female</td>
<td>Tissue</td>
<td>90</td>
<td>3.70 (.69)</td>
<td>4.70 (1.21)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shampoo</td>
<td>96</td>
<td>3.69 (1.13)</td>
<td>4.64 (1.57)</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>Tissue</td>
<td>90</td>
<td>3.90 (1.26)</td>
<td>4.33 (.80)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shampoo</td>
<td>107</td>
<td>3.60 (1.17)</td>
<td>4.69 (.88)</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td></td>
<td>383</td>
<td>3.71 (1.08)</td>
<td>4.59 (1.15)</td>
</tr>
</tbody>
</table>

Notes: Scale ranges from 1 (negative, low) to 7 (positive, high). Data are mean values; standard deviation in parentheses. Mean values in the same line with different subscripts are different at the .05 level (Scheffé-Test).

Tab. 8: Effect of model body size on product evaluations, appearance self-esteem, model attractiveness, and model-self similarity (Study 3)
Tab. 9: Results of the application of a Hayes procedure to test the effects of model attractiveness, appearance self-esteem, and model-self similarity on product evaluations (Study 3)

<table>
<thead>
<tr>
<th>Step 2: Estimating the statistical model used in Step 1 for each level of the category’s appearance-relatedness</th>
<th>Hypothesis</th>
<th>Effect</th>
<th>Estimate</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effect of model attractiveness on appearance self-esteem (H2a)</td>
<td>$b_{\text{attractiveness} \rightarrow \text{appearance self-esteem}}$</td>
<td>-.42</td>
<td>-12.41</td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>Effect of model body size on appearance self-esteem (while controlling for the effect via model attractiveness) (H2b)</td>
<td>$b_{\text{attractiveness} \rightarrow \text{appearance self-esteem}}$</td>
<td>.45</td>
<td>3.13</td>
<td>&lt;.01</td>
<td></td>
</tr>
<tr>
<td>Effect of model attractiveness on product evaluations (H2c)</td>
<td>$b_{\text{appearance self-esteem} \rightarrow \text{evaluations}}$</td>
<td>.10</td>
<td>3.29</td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>Effect of model body size on model-self similarity (H3a)</td>
<td>$b_{\text{similarity} \rightarrow \text{evaluations}}$</td>
<td>.88</td>
<td>6.27</td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>Effect of model-self similarity on product evaluations (H3b)</td>
<td>$b_{\text{similarity} \rightarrow \text{evaluations}}$</td>
<td>.99</td>
<td>22.49</td>
<td>&lt;.001</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Definition of the binary variables: $d1=1$ (average-sized model), 0 (else); $d2=1$ (heavy model), 0 (else).

In our Theory section, we developed a hypothesis for neither the effect of model attractiveness on model-self similarity nor the effect of appearance self-esteem on model-self similarity. The estimates are as follows: $b_{\text{attractiveness} \rightarrow \text{similarity}} = .40 (t = 8.32, p < .001)$ and $b_{\text{appearance self-esteem} \rightarrow \text{similarity}} = -.02 (t = - .52, ns)$. The positive attraction effect on similarity perceptions is probably wishful thinking; it might cause more mental difficulties to recognize similarity to a less beautiful person than to realize similarity to a beautiful person [4].

7.4.3. Results of the tests

Overall, the effects found in Study 2 could be replicated. All hypotheses tested in this study could be supported. The inclusion of model-self similarity as a mediating variable resulted in a positive effect of appearance self-esteem on product evaluations. Thus, while Study 2 did not support H2c, this study provided evidence for H2c.
7.5. Interpretation

These findings offer a solution for the hard-to-interpret findings of Study 2. Contact with a model with a slim figure reduces appearance self-esteem in average-sized consumers that – in accordance with the results of Study 3 – negatively influences product evaluations. If model body size approximately equals the consumer’s body size, relatively high perceptions of similarity resulted, which affected product evaluations favorably. The strong effect of model body size via similarity can be used to explain why the shape of the relationship between model body size and product evaluations is inverted U-shaped for consumers with average body size.

8. Study 4: The mediating role of model-self similarity depending on consumer body size

In the studies presented above, only average-sized consumers provided data. In Study 4, we expand the data sample by also considering slim and heavy consumers. However, in this study, we focus on the mediating effect of model-self similarity.

8.1. Experimental design

We used Aldo Vandini brand body lotion as a test object that was an unknown brand for the test participants. We created three ad versions showing a female model (slim, average, heavy) and three ad versions showing a male model (slim, average, heavy). The ads were similar to those used in Studies 2 and 3. We exposed a sample of female students to the ads containing an image of the female model and a sample of male students to the ads depicting a male model. We collected data from students who strongly differed regarding their body size. Thus, we used an experimental 3 (consumer body size: slim, average, or heavy) × 3 (model body size: slim, average, or heavy) × 2 (consumer gender: female or male) between subjects design. The consumer gender variable was only included to test the generalizability of the results.

8.2. Procedure, measurement, and sample

In total, 554 students participated in this study (55.9 % female, M_age = 24.71). The weight of the test persons ranged from 40 kg to 130 kg. We calculated the body mass index and classified the participants as follows: slim if BMI < 18.5, average if 18.5 < BMI ≤ 25, and heavy if BMI > 25. The interviewers were requested to contact slim, average-sized, or heavy students. Thus, the resulting sample distribution (N = 174 slim consumers, N = 166 average-sized consumers, and N = 214 heavy consumers) does not reflect the distribution in the population of all students at the university where data collection took place, i.e., we did not use stratified sampling. The test persons were exposed to one ad version and had to indicate product evaluations (Cronbach’s Alpha = .902) and model-self similarity (r = .673). The measures have been adopted from Study 3.

8.3. Description of results

Tab. 10 presents the effect of the model’s body size on model-self similarity and product evaluations depending on the consumer’s body size.

<table>
<thead>
<tr>
<th>Response variable</th>
<th>Consumer body size</th>
<th>Consumer gender</th>
<th>Sample size</th>
<th>Model body size</th>
<th>ANOVA F (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model-self similarity</td>
<td>Slim consumer</td>
<td>Female consumer</td>
<td>74</td>
<td>4.09 (1.22)</td>
<td>3.55 (1.16), 2.94 (1.32), 5.663 (.005)</td>
</tr>
<tr>
<td></td>
<td>Male consumer</td>
<td>100</td>
<td>4.23 (1.44)</td>
<td>3.63 (1.63), 2.63 (8.1), 11.145 (&lt;.001)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>174</td>
<td>4.19 (1.36)</td>
<td>3.60 (1.45), 2.80 (1.12), 17.193 (&lt;.001)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Average-sized consumer</td>
<td>Female consumer</td>
<td>72</td>
<td>3.37 (1.01)</td>
<td>4.21 (1.52), 3.49 (1.50), 1.852 (.165)</td>
</tr>
<tr>
<td></td>
<td>Male consumer</td>
<td>94</td>
<td>3.05 (3.1)</td>
<td>4.97 (9.8), 3.65 (1.3), 26.214 (&lt;.001)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>166</td>
<td>3.18 (1.19)</td>
<td>4.76 (1.19), 3.55 (1.36), 23.287 (&lt;.001)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heavy consumer</td>
<td>Female consumer</td>
<td>128</td>
<td>3.17 (1.69)</td>
<td>4.84 (1.38), 3.25 (1.78), 11.381 (&lt;.001)</td>
</tr>
<tr>
<td></td>
<td>Male consumer</td>
<td>86</td>
<td>3.03 (1.56)</td>
<td>4.17 (1.66), 3.14 (1.58), 4.834 (.010)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>214</td>
<td>3.10 (1.61)</td>
<td>4.51 (1.55), 3.22 (1.73), 15.132 (&lt;.001)</td>
<td></td>
</tr>
<tr>
<td>Product evaluations</td>
<td>Slim consumer</td>
<td>Female consumer</td>
<td>74</td>
<td>4.10 (1.05)</td>
<td>3.43 (1.14), 2.95 (1.25), 6.507 (.003)</td>
</tr>
<tr>
<td></td>
<td>Male consumer</td>
<td>100</td>
<td>4.43 (1.41)</td>
<td>3.86 (1.51), 3.63 (1.17), 3.703 (.028)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>174</td>
<td>4.31 (1.11)</td>
<td>3.69 (1.38), 3.26 (1.25), 11.432 (&lt;.001)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Average-sized consumer</td>
<td>Female consumer</td>
<td>72</td>
<td>3.40 (9.7)</td>
<td>4.27 (1.61), 3.33 (1.26), 3.309 (.042)</td>
</tr>
<tr>
<td></td>
<td>Male consumer</td>
<td>94</td>
<td>4.27 (1.30)</td>
<td>4.83 (1.29), 3.96 (1.56), 3.464 (.035)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>166</td>
<td>3.92 (1.29)</td>
<td>4.68 (1.39), 3.58 (1.41), 10.565 (&lt;.001)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heavy consumer</td>
<td>Female consumer</td>
<td>128</td>
<td>3.42 (1.33)</td>
<td>4.13 (1.16), 3.41 (1.44), 3.350 (.038)</td>
</tr>
<tr>
<td></td>
<td>Male consumer</td>
<td>86</td>
<td>3.27 (1.40)</td>
<td>3.95 (1.03), 3.22 (1.29), 3.100 (.050)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>214</td>
<td>3.34 (1.35)</td>
<td>4.04 (1.09), 3.37 (1.40), 6.129 (.003)</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Scales range from 1 (low similarity, negative evaluations) to 7 (high similarity, positive product evaluation). Data are mean values; standard deviations in parentheses. Mean values in the same line with different subscripts are different at the .05 level (Scheffé-Test).

Tab. 10: Effect of model body size on model-self similarity and product evaluations depending on consumer body size and model body size (Study 4)
For slim consumers, the findings show that similarity perceptions and product evaluations decrease with increasing model body size. For average-sized consumers, the results reveal an inverted U-shaped relationship between model body size on the one hand and similarity perceptions and product evaluations on the other hand. The same pattern of results could be found for heavy consumers. In Fig. 6, we depict the relationship between model body size and product evaluations in dependence of consumer body size. The effect sizes $\eta^2$ of this relationship are as follows: .118 (slim consumers), .115 (average-sized consumers), and .055 (heavy consumers).

### 8.4. Test of the hypotheses

#### 8.4.1. Preceding analysis

A three-way ANOVA with consumer gender, model body size, and consumer body size as factors and model-self similarity perceptions as dependent variable did not provide significant interaction effects of consumer gender with the other factors (consumer gender $\times$ consumer body size $F_{2,536} = 1.303, \text{ns}$; consumer gender $\times$ model body size $F_{2,536} = .149, \text{ns}$; consumer gender $\times$ consumer body size $\times$ model body size $F_{4,536} = 1.317, \text{ns}$). Thus, in the following analyses, we collapsed the data across the consumer gender factor.

#### 8.4.2. Estimating a statistical model

We again estimated the coefficients of Hayes models to calculate effects that can be used to test the hypotheses. Admittedly, Hayes model 9 can be used to include two binary variables to express the independent variable (here: two binary variables expressing three levels of the model’s body size), the mediating variable (here: model-self similarity), the dependent variable (here: product evaluations), and two moderating variables (here: two binary variables expressing three levels of the consumers’ body size) that shape the relationship between the binary variables expressing the independent variable and the mediating variable. However, for simplicity and to increase comprehensibility, we calculated the model estimates step by step.

In Step 1, we started with estimating the effects of $d_1$ (average vs. slim model) on model-self similarity depending on the consumer body size (average vs. slim consumer) by using Hayes model 1 that, for instance, results in $b_{d_1} = \text{similarity|slim consumer} = .59 (p < .01)$; this effect reflects the difference $M_{\text{average model|slim consumer}} - M_{\text{slim model|slim consumer}} = .19$. By repeating this procedure for all other model body size/consumer body size combinations, we obtained estimates of model body size on model-self similarity depending on the levels of consumer body size. To provide another example, $b_{d_2} = \text{similarity|heavy consumer} = .12 (\text{ns})$, which is the mean difference $M_{\text{average model|heavy consumer}} - M_{\text{slim model|heavy consumer}} = .32 - .30 = .12$. These estimates are reported in the upper part of Tab. 11.

In Step 2, we calculated the effect of model-self similarity on product evaluations. We used the total sample, included $d_1$ and $d_2$ as independent variables, model-self similarity as mediating variable, and product evaluations as dependent variable. The application of Hayes model 4 provided the relevant estimate.

In Step 3, we assessed the moderating effect of consumer body size by comparing $b_{d_1}$ and $b_{d_2}$ across different consumer-body-size conditions. Thus, we estimated mean differences of these effects; they are shown in the lower part of Tab. 11.

### 8.4.3. Results of the tests

In H3a, we presumed a positive effect of objective similarity of model and consumer body size on overall perceptions of model-self similarity. According to this hypothesis, similarity perceptions are expected to be highest in the slim-model condition for slim consumers, highest in the average-sized-model condition for average-sized consumers, and highest in the heavy-model condition for heavy consumers. For slim consumers, perceptions of model-self similarity decrease with increasing model body size ($M_{\text{slim model}} = 4.19, M_{\text{average model}} = 3.60$, $M_{\text{heavy model}} = 3.37$).
and $M_{\text{heavy}} = 2.80$). The mean differences $b_{d1} \rightarrow \text{similarity}_{\text{heavy}} = 3.60 - 4.19 = -0.59$ and $b_{d2} \rightarrow \text{similarity}_{\text{average}} = 2.80 - 4.19 = -1.39$ are significant at the .001 level and consistent with H3a. For average-sized consumers, contact with average-sized models causes the highest perceptions of model-self similarity ($M_{\text{slim}} = 3.18$, $M_{\text{average}} = 4.76$, and $M_{\text{heavy}} = 3.55$). The mean differences are $b_{d1} \rightarrow \text{similarity} = 4.76 - 3.18 = 1.59$ ($p < .001$) and $b_{d2} \rightarrow \text{similarity} = 3.55 - 3.18 = .38$ (ns); the latter effect indicates that there is no difference between the slim-model and the heavy-model condition with respect to model-self similarity perceptions of average-sized consumers. These findings also provide evidence for H3a. Finally, for heavy consumers, model-self similarity perceptions do not increase with increasing model body size ($M_{\text{slim}} = 3.10$, $M_{\text{average}} = 4.51$, and $M_{\text{heavy}} = 3.22$). Thus, H3a cannot be supported for this consumer segment. In H3c, we expected this special effect.

In H3b, we postulated a positive effect of model-self similarity on product evaluations. The estimate $b_{\text{similarity} \rightarrow \text{evaluations}} = .66$ ($p < .001$) is consistent with this presumption.

In total, the findings of Step 3 of our estimations indicate that model-self similarity perceptions with slim, average, or heavy models are contingent on the model’s body size; otherwise, these effects would be absent. In particular, in H3c, we hypothesized that heavy consumers perceive themselves as more similar to average-sized models than to heavy models. The findings provide evidence for this presumption. The effect $b_{d1} \rightarrow \text{similarity}_{\text{slim}} = 1.41$ ($p < .001$) for heavy consumers indicates that similarity perceptions were higher in the average-sized-model condition compared to the slim-model condition, and $b_{d2} \rightarrow \text{similarity} = .12$ (ns) shows that there are no differences between the slim-model and the heavy-model condition, suggesting that similarity perceptions were higher in the average-sized-model condition compared to both the slim-model and the heavy-model conditions. Thus, H3c is supported.

### 9. Answers to the research questions

Our studies aimed to investigate the impact of the body size of models depicted in advertisements on evaluations of the promoted products.

First, we asked the question concerning the type and strength of the relationship between model body size and perceptions of model attractiveness. Based on data provided by young, average-sized consumers, we found a strong positive relationship consistent with the “slim = beautiful” stereotype. Previous research had also found this type of relationship; however, in recent studies, the findings were mixed (e.g., Bian and Wang 2015; Borau and Bonnefon 2017). Our studies (Experiments 1, 2, and

---

### Tab. 11: Results of the application of the Hayes procedure to test the mediating effects of model-self similarity on product evaluations depending on consumer body size (Study 4)

<table>
<thead>
<tr>
<th>Step 1: Estimating six statistical models each with one independent (binary), one dependent variable, and one moderating (binary) variable (Hayes 2012, model 1)</th>
<th>Hypothesis</th>
<th>Effect</th>
<th>Estimate</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effect of the objective similarity of model and consumer body size on perceptions of overall model-self similarity (H3a)</td>
<td>$b_{d1} \rightarrow \text{similarity}_{\text{slim consumer}}$</td>
<td>-.59</td>
<td>-2.40</td>
<td>&lt;.01</td>
<td></td>
</tr>
<tr>
<td>$b_{d1} \rightarrow \text{similarity}_{\text{average consumer}}$</td>
<td>1.59</td>
<td>6.43</td>
<td>&lt;.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$b_{d1} \rightarrow \text{similarity}_{\text{heavy consumer}}$</td>
<td>1.41</td>
<td>5.13</td>
<td>&lt;.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$b_{d2} \rightarrow \text{similarity}_{\text{slim consumer}}$</td>
<td>-1.39</td>
<td>-6.13</td>
<td>&lt;.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$b_{d2} \rightarrow \text{similarity}_{\text{average consumer}}$</td>
<td>.38</td>
<td>1.41</td>
<td>ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$b_{d2} \rightarrow \text{similarity}_{\text{heavy consumer}}$</td>
<td>.12</td>
<td>.47</td>
<td>ns</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2: Estimating the effect of model-self similarity on product evaluations (Hayes 2012, model 4)</th>
<th>Hypothesis</th>
<th>Effect</th>
<th>Estimate</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effect of model attractiveness on product evaluations (H3b)</td>
<td>$b_{\text{similarity} \rightarrow \text{evaluations}}$</td>
<td>.66</td>
<td>15.59</td>
<td>&lt;.001</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Definition of the binary variables: $d_1=1$ (average-sized model), 0 (else); $d_2=1$ (heavy model), 0 (else).

Confidence intervals of the estimates can be calculated by $b \pm t(1-\alpha/2)n$, with $t_\alpha = t$. |
3) indicate that this stereotype still exists and that it is rather strong.

Second, we asked the question about the role of the product category for the effect of model body size and product evaluations. Our findings indicate that perceptions of model attractiveness induced by model slimness spill over more intensely onto product evaluations when the models promote appearance-related products. However, independently of the considered category (perfume, shampoo, body lotion, digital camera, and tissues), we found an inverted U-shaped relationship between model body size (three levels) and product evaluations in samples of young, average-sized consumers. Thus, we conclude that marketers need not give much attention to the category the promoted product belongs to when choosing a model with a particular body size.

Third, we were interested in answering the question about the role of model attractiveness, consumer appearance self-esteem, and model-self similarity. Previous research led to the conclusion that slim models are more attractive what spills over positively onto product evaluations. However, prior research also found that slim models provoked negative feelings in average-sized consumers regarding their body size (negative mood, body anxiety, envy, body dissatisfaction, eating disorder tendencies, depression, etc.). According to the arguments in previous research, these negative feelings were suppressed and not transferred to the promoted product. A further source of confusion resulted from the observed inverted U-shaped relationship between model body size and product evaluations. Our findings support the presumption that model attractiveness, appearance self-esteem, and perceptions of model-self similarity are empirically relevant reasons why model body size affects product evaluations. Our data provided support to our hypotheses (see Tab. 12). Only H2c has not been supported in one of the studies. We argued why this lack of support happened and provided support to H2c in Study 3.

Fourth, we asked the question about how slim and heavy consumers respond to models with different body sizes. We found that slim consumers responded relatively favorably to products promoted by slim models. Heavy consumers did not respond relatively favorably to products when heavy models (“super-size models”) were depicted in advertisements; instead, they reacted favorably when average-sized models were shown.

### 10. Limitations

There are several factors that should be mentioned as weaknesses of our research.

With respect to test persons, we focused on student samples and thus on rather young and well-educated persons. Based on the findings of a meta-analysis, Trzesniewski et al. (2003, p. 205) reported that “self-esteem stability was low during childhood, increased throughout adolescence and young adulthood, and declined during midlife and old age.” Thus, one might expect that very young people and very old people are more influenced by models and their physical characteristics than are young adults. Further, we used average-sized consumers to estimate the mediating effects of model attractiveness and appearance self-esteem. Thus, it is unclear whether these mediation effects are generalizable for slim and heavy consumers.

Regarding the test objects, we only considered a small sample of products (perfume, shampoo, body lotion, digital camera, and tissues). This sample was composed of highly appearance-related products (perfume and shampoo) and appearance-unrelated products (camera and tissues). However, for slimness-related products and services (e.g., gyms, diet products and textiles), different findings might be expected. For instance, the effect via attractiveness might be stronger. Concerning the models, we focused on models in a decorative role. We did not use models who explicitly endorsed the purchase of the product. Model-self similarity perceptions are probably lower when spokespersons are used as models.

We only considered two often-discussed mediating variables (model attractiveness and consumer’s appearance...
self-esteem) and added perceptions of model-self similarity. Recent research suggests that ethical concerns and negative feelings in response to slim models (even disgust and reactance) should also be considered. We did not include such variables in our investigations. Our investigations cannot reveal effects in opposite-gender conditions. For instance, some products targeting primarily male consumers are promoted by ads that depict female models; we did not provide findings on how consumers respond to products when slim, average-sized, or heavy models of the opposite gender are depicted.

In contrast to the presumption previously often stated in the literature that female consumers respond more strongly toward model body size (Cohn and Adler 1992), we did not find remarkable differences between female and male test participants. There is also probably a trend that young men have to be slim to be perceived as attractive. Using a sample of rather young people who grew up in a period of more gender equality might have caused this effect. However, a more detailed analysis should be conducted to reveal gender differences, especially for products targeting primarily females and products primarily targeting male consumers such as gender-specific underwear.

Finally, we want to add the notion that the effect sizes for the impact of model body size on product evaluations observed in our experiments were rather low. Thus, creating advertisements that either do or do not visually emphasize model body size and testing this effect would improve the insights into the advertising effectiveness of model body size.

11. Implications

11.1. Implications for theory

Is there something what is really new in our findings with respect to academic knowledge? Previous research indicated that model body size has two important consequences (a positive effect on model attractiveness and a negative effect on appearance self-esteem) and that only model attractiveness plays a role for product evaluations (at least when an appearance-related product is promoted) while negative feelings due to reduced appearance self-esteem are irrelevant for product evaluations or suppressed. We add the findings that a decrease in appearance self-esteem indeed has a negative effect on model-self similarity. Concluding, our findings from Study 3 can help to understand why a misspecification of the statistical model might have resulted in a null effect of appearance self-esteem in prior research and in our Study 2.

11.2. Implications for advertising practice

If average-sized or heavy consumers are targeted, advertising that aims at favorable or improved product evaluations should depict average-sized models. Relying on the “slim = beautiful” stereotype is not sufficient for creating effective advertisements. When advertisers want to attract slim consumers, slim models should be preferred. Advertisers should be cautious when selecting “super-size” models because even heavy consumers respond more favorably to average-sized consumers. Advertisers must not focus on whether the promoted product is appearance-related when deciding on models with a particular body size.

12. Suggestion for future research

For future research, we recommend including the aspect of authenticity into the experimental designs. Generally, the adjective “in authentic” is used if perceivers believe that something is “faked,” “not real,” “not genuine,” or that the communicator is “pretending something” (Grandy et al. 2005, p. 49; Côté et al. 2013, p. 456). In our studies, we used depictions of real people and thus analyzed the effect of “authentic” slimness. None of our test participants articulated any doubt that the images of the models differed from their real appearance.

However, in practice, some marketers have produced models images with inauthentic slimness. They use image-editing software to create idealized model images. For instance, in 2001, H&M created different ad versions promoting bikinis by depicting the same virtual, perfectly slim mannequin body with different real women’s heads on it.

Similarly to the public debate about using really slim models, there is also debate about whether such idealized models shown in advertisements should be used and, if they are shown, about whether the fact that they are idealized (e.g., retouched) should be reported in the advertisement. Outside the field of advertising, there are several apps such as FaceTune that allow modifying pictures of one’s own body (e.g., to make one’s face appear brighter) prior to uploading the images on social media platforms; such tools also triggered public debates.

As a result of such controversial debates, some advertisers announced to consumers whether they idealize images of models. American Eagle Outfitters, which is a supplier of textiles, recently launched the #AerieREAL campaign, which contains the note that the depicted models are not retouched. At present, Dove uses the mark “No digital distortion” to indicate that the body of the depicted person was not modified by image editing. H&M and the online shop ASOS announced that they will use unretouched models in the future. In France, advertisements now have to contain the comment “photographie retouchée” if the model is retouched by image-editing software to make the body shape, for instance,
look even slimmer; in practice, advertisers used the note “photo non retouchée” to indicate that the model’s image has not been modified.

These developments indicate that the issue of the authenticity of model slimness will gain higher attention in the future (e.g., Schirmer et al. 2018). Thus, for future research, we recommend adding the aspect of authenticity to investigations of the slimness of human models depicted in advertisements. In other words, in experiments, models should be varied not only with respect to their real body size but also with respect to the degree to which their appearance is artificially idealized.

Notes
[1] To test the effect of the presence vs. absence of a model image in the advertisements, we also created ad stimuli for both products that did not show any model, as depicted in Fig. 4. For the digital camera, product evaluations were $M_{\text{model absent}} = 3.88$ ($SD = 1.46$, $N = 60$). When a slim, average-sized, or heavy model was depicted, product evaluations were $M_{\text{slim}} = 4.00$ ($SD = 1.31$, $N = 71$), $M_{\text{average}} = 4.98$ ($SD = 1.06$, $N = 55$), and $M_{\text{heavy}} = 4.00$ ($SD = 1.25$, $N = 57$). Pairwise comparisons show that only the depiction of an average-sized model resulted in higher product evaluations compared to the model-absent condition ($t_{(113)} = 4.65$, $p < .001$). For the perfume, product evaluations were $M_{\text{model absent}} = 4.37$ ($SD = 1.95$, $N = 60$). Including a slim, average-sized, or heavy model provided $M_{\text{slim}} = 4.49$ ($SD = 1.52$, $N = 60$), $M_{\text{average}} = 5.15$ ($SD = 0.97$, $N = 60$), and $M_{\text{heavy}} = 4.27$ ($SD = 1.19$, $N = 60$). Again, only the depiction of the average-sized model improved product evaluations compared to the model-absent condition ($t_{(112)} = 2.77$, $p < .01$).

[2] In Study 2, we analyzed the discriminant validity of model attractiveness (two variables assessing this concept) and appearance self-esteem (four variables assessing this concept): $CR_{\text{appearance self-esteem}} = .81$, $AVE_{\text{appearance self-esteem}} = .78$; $CR_{\text{attractiveness}} = .92$, $AVE_{\text{attractiveness}} = .66$; and correlation between the appearance self-esteem factor and the model attractiveness factor $r = -.18$. Note that this correlation is calculated on the basis of the estimates of a factor analysis and not on the basis of arithmetically averaged items. The average-variance-extracted values exceed the squared factor correlation, indicating discriminant validity according to the criterion of Fornell and Larcker (1981).

[3] We also investigated the discriminant validity of the mediating variables used in Study 3. The average-variance-extracted values and the values of composite reliability are as follows: $CR_{\text{appearance self-esteem}} = .96$, and $AVE_{\text{appearance self-esteem}} = .85$; $CR_{\text{attractiveness}} = .96$, and $AVE_{\text{attractiveness}} = .92$; $CR_{\text{similarity}} = .94$, and $AVE_{\text{similarity}} = .88$. The factor correlations are as follows: $r_{\text{appearance self-esteem, attractiveness}} = .26$; $r_{\text{appearance self-esteem, similarity}} = .36$; and $r_{\text{attractiveness, similarity}} = .25$. Because the AVE values exceed the squared factor correlations, the mediating variables possess discriminant validity according to the criterion of Fornell and Larcker (1981).

[4] Some authors who investigated the effect of model body size on product evaluations additionally included ad likeability as a mediating variable in their models (Häfner and Trompe 2009; Janssen and Paas 2014; Yu 2014). Thus, we could expand our model by this variable. The inclusion of attitude toward the ad cannot change the results for $X \rightarrow Med 1$, $X \rightarrow Med 2$, $X \rightarrow Med 3$, or $Med 1 \rightarrow Med 2$ (X: model body size, Med 1: model attractiveness, Med 2: appearance self-esteem, Med 3: model-self similarity). Thus, to test the mediating role of the attitude toward the ad, the following model can be used (Fig. A1).

We also assessed attitudes toward the advertisement in Study 3 by asking the test participants to agree or disagree with “This advertisement is likeable” and “This advertisement is appealing” on a seven-point scale ($r = .78$). We used Hayes’ model 4, which allows the inclusion of multiple independent variables in a mediation model. Note that Hayes and Preacher (2014, p. 544) do not criticize the use of a continuous independent variable. They demand, “If M and Y are treated as continuous, X is either dichotomous or treated as continuous.” The model estimates are as follows: $b_{\text{attractiveness}} \rightarrow \text{attitude toward the ad} = .99$ ($p < .001$); $b_{\text{appearance self-esteem}} \rightarrow \text{attitude toward the ad} = .13$ ($p < .001$); $b_{\text{similarity}} \rightarrow \text{attitude toward the ad} = .79$ ($p < .001$); and $b_{\text{self-attitude toward the ad}} \rightarrow \text{ad evaluations} = .85$ ($p < .001$). Thus, there is evidence that ad attitude is a mediating variable. However, we wanted to create a parsimonious model at the end of the Theory section and thus refrained from including attitude toward the ad in the description of Study 3.

References


**Keywords**

- Model Body Size
- Model Attractiveness
- Appearance Self-Esteem
- Model-Self Similarity
- Brand Evaluations