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Beware to compare:

Effects of different comparison standards on body-related self-assessment among young women

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ABSTRACT

Studies show that frequent exposure to individuals meeting normative beauty ideals in (social) media can damage one's body image and self-esteem. Furthermore, eating and body dysmorphic disorders are promoted, especially among young women. According to Festinger's Theory of Social Comparison (1954), the level of attractiveness of the comparison standard is a key factor in the process, while Mussweiler's Selective Accessibility Model (2003) suggests focus of comparison as an important moderator. In a 2x2 experiment, *n* = 160 women aged 18 to 30 were asked to first complete an image task to manipulate comparison focus (similarities vs. differences). Subsequently, as a manipulation of comparison standard, images of normatively highly vs. moderately attractive women were to be evaluated. Body-related self-assessment was measured using two scales. High comparison standards had a significant negative effect, while comparison focus did not affect these data. Results, implications and practical recommendations for action are discussed from an interdisciplinary point of view.

Keywords: social comparison, body acceptance, attractivity, self-esteem, body dysmorphic disorder

ZUSAMMENFASSUNG

Studien zeigen, dass die häufige Konfrontation mit gängigen Schönheitsidealen entsprechenden Personen in (sozialen) Medien das eigene Körperbild und den Selbstwert schädigen kann. Gerade bei jungen Frauen werden dadurch zudem Ess- und körperdysmorphe Störungen begünstigt. Der Theorie des sozialen Vergleichs von Festinger (1954) zufolge kommt es im Prozess vor allem auf die Attraktivität des Ver-gleichsstandards an, dem Selective Accessibility Model von Mussweiler (2003) zufolge zudem maßgeblich auf den Vergleichsfokus als Modera-torvariable. In einem 2x2-Experiment wurden *n* = 160 Frauen zwischen 18 und 30 Jahren gebeten, unter einem Vorwand zunächst eine Bildaufgabe zur Manipulation des Vergleichsfokus‘ (Ähnlichkeiten vs. Unterschiede) zu bearbeiten. Anschließend wurden als Manipulation des Vergleichsstandards nach normativen Kriterien hoch vs. moderat attraktive Frauenbilder gezeigt, die beurteilt werden sollten. Daraufhin wurde die körperbezogene Selbsteinschätzung über zwei Skalen erfasst. Hohe Vergleichsstandards wirkten sich dabei negativ aus, während der Vergleichsfokus die Daten nicht beeinflusste. Ergebnisse, Implikationen und praktische Handlungsempfehlungen werden aus interdisziplinärer Sicht diskutiert.

Schlüsselwörter: Sozialer Vergleich, Körperakzeptanz, Attraktivität, Selbstwert, körperdysmorphe Störung

1 Introduction

Body-related self-esteem is a central dimension of self-concept closely linked to mental health and social identity (Harter, 2012; von Collani & Herzberg, 2003), at least in the so-called Western world. At the same time, a study by the Robert Koch Institute shows a decline in body-related self-esteem during adolescence (HBSC, 2018). Young women in particular display a negative body image depending on role models and ideal images (Finne, Schlattmann & Kolip, 2020). As these are largely conveyed by the media, the steadily increasing media consumption among adolescents and young adults underscores the relevance of the topic (Klein, 2013; PQ Media, 2024).

In addition to a general vulnerability to negative self-esteem, social comparison processes are a key explanatory factor for the development of low body-related self-esteem (Myers & Crowther, 2009; Vartanian & Dey, 2013). These social comparison processes can be adversely influenced by increasingly demanding beauty ideals and social norms (Schüttel, 2020). High social body ideals not only change one's own understanding of beauty and attractiveness, but also one's subjective body perception and body-related self-esteem (Cash & Smolak, 2011; Liedmann, 2006). Accordingly, a study by Swami et al. (2010) showed a negative influence of social comparisons in connection with internalised beauty ideals on body-related self-esteem.

Young women seem particularly vulnerable here, as they are at increased risk of negative self-evaluation due to social norms (Swami et al., 2010). In addition to affective and cognitive consequences, negative body image can also lead to serious mental health problems such as eating disorders or body dysmorphic disorder (Martin & Svaldi, 2015).

2 Theoretical background

In the following section, we present a brief summary of the most relevant concepts, processes and findings in the field on which the present research is built.

Body-related self-esteem: influencing factors and consequences

Body-related self-esteem describes the subjective evaluation of one's own body image and its effect on general self-satisfaction and overall self-esteem (Grogan, 2021; Stice & Whitenton, 2002). The actual effect of body-related self-esteem on global self-esteem varies from person to person (Feingold & Mazzella, 1998). Body-related self-assessment has both cognitive and emotional effects. While cognitive processes manifest themselves in the form of negative and distressing thoughts about individual or multiple body regions, emotional effects are expressed through feelings of shame, discomfort or dissatisfaction (Tiggemann, 2004). In addition, the stability of body-related self-esteem can vary over the lifespan due to a variety of factors. Young people have been shown to be particularly vulnerable (Wilkosz et al., 2011).

Body-related self-esteem is particularly important in the field of clinical psychology (Arkenau-Kathmann, 2022). Studies show that body-related self-esteem contributes significantly to global self-esteem and psychological well-being. People who have a positive body image tend to have high global self-esteem and high psychological well-being (Cash & Pruzinsky, 2002). Body-related self-esteem can be strengthened through social support, thereby improving mental health in a preventive manner. Low body-related self-esteem is considered a risk factor in the aetiology of mental disorders. These include in particular body dysmorphic disorder and eating disorders (Hutterer, 2013). In cases of already manifest body dissatisfaction and psychological stress, interventions such as body acceptance, mindfulness exercises and self-esteem enhancement can lead to improvement (Neff, 2003).

Body-related self-esteem is generally affected by a variety of complex interrelated factors (Götz, 2022; Stronski, 2018). Biological and medical aspects that almost exclusively have a negative influence on body-related self-esteem are injuries, illnesses and disabilities that lead to fears of not being able to meet social norms (Fox, 2000). Another biological factor is the developmental physical changes during puberty. These can lead to serious insecurities that have a negative impact on body satisfaction. Girls often experience unexpected weight gain while striving for the ideal of slimness (Swami et al., 2010).

In addition, a negative body image may be created or perpetuated by sociocultural influences, e.g. through negative feedback from family or peer groups about one's own appearance, or through strong norms as reflected in "typical" appearances of protagonists in all kinds of media. Internalisation of societal beauty ideals as a standard or goal has a direct impact on the construal of one's body image and is one of the most severe risk factors for body dissatisfaction as well as for eating disorders (Karazcia et al., 2013). Another study confirmed a significant correlation between negative comments about weight or appearance and low body-related self-esteem (Keery et al., 2005). In addition, there is a stigma attached to being overweight in so-called Western society (Hilbert et al., 2013), and body dissatisfaction seems to increase with body mass index in adolescence (Dantas et al., 2017). This stigma can lead to excessive feelings of shame and a distorted and negative attitude towards one's own body (Puhl & Heuer, 2009).

Psychological factors include individual personality traits. People with low self-esteem are more susceptible to internalising societal beauty ideals, which is often accompanied by a negative image of one's own body (Vartanian & Dey, 2013). Schemer (2007) found that young women with low self-esteem were affected more strongly by social upward comparison than peers with a higher self-esteem. In addition, personality traits such as perfectionism are a risk factor for low body-related self-esteem. Perfectionist personality traits can lead to unrealistic expectations of one's own body, which cannot be fulfilled, thus leading to long-term frustration with one's appearance (Vartanian & Dey, 2013).

Social comparison theory and the selective accessibility model

In his social comparison theory, Leon Festinger (1954) postulates that people have a basic need for constant self-evaluation, both in terms of individual characteristics and in terms of performance and success. This evaluation is typically accompanied by a comparison with other people, as objective criteria are often lacking. Social comparisons can be upward, i.e. with people who seem to have the relevant characteristic - such as intelligence or attractiveness - to a higher extent, or they can be downward, i.e. with people who seem to have the relevant characteristic to a lesser extent, as well as lateral, i.e. at approximately the same level. A downward social comparison can promote an increase in self-esteem, and lateral comparisons are considered as often most informative about oneself, e.g., when comparing one's athleticism achievements with people the same age (Festinger, 1954). Upward comparisons may stimulate motivational processes and initiate self-improvement, but at the same time they can have a negative impact on self-image, especially when the gap is perceived as too high and the standard thus as unattainable (Suls & Wheeler, 2000). Tesser (1988) assumes that upward social comparison causes high levels of frustration, in particular, when the person is at the same time psychologically close, for example when a fellow student in the same program receives a scholarship because of a better grade. Painful social comparisons may also emerge in romantic relationships, as partners often lead similar lives and strive for similar goals. Festinger (1954) assumes that people tend to compare themselves more often with individuals who are considered better in certain aspects or in general, as this provides a realistic incentive for individual development. However, the high frequency of upward comparisons also

increases the associated risks to self-esteem and self-image.

A refinement of social comparison theory was proposed by Mussweiler (2003) with his model of selective accessibility, which focuses on cognitive aspects of the comparison process. He assumes that individual self-evaluation is determined not only by the direction of the comparison (upward vs. downward), but also by the focus of the comparison process. The focus of comparison can be on similarities vs. differences, which in turn is determined by an initial assessment of the degree of similarity to the comparison standard (Mussweiler, 2003; Mussweiler et al., 2004). This perceived similarity controls the search for relevant knowledge about one's own self in a selective and confirmatory manner: if the initial assessment suggests similarity, the selective search process should cognitively activate supportive, hypothesis-consistent information about the self. This kind of information becomes more accessible and therefore comes to mind more easily in the subsequent self-assessment, for which it serves as database. Consequently, having a lot of "evidence" for similarities with the standard in mind, an assimilation effect emerges (Mussweiler, 2003). If, on the other hand, the initial hypothesis postulates a rather low similarity (especially in the case of extreme comparison standards), hypothesis-consistent test strategies render information selectively more accessible that suggests dissimilarity, and the subsequent judgment is based on this "evidence", resulting in a contrast effect of oneself being quite different from the standard, i.e. way more successful, or a lot less attractive.

This also means that the anchor or standard and focus of a comparison process must always be considered in interaction with each other: an upward comparison with a high standard can positively affect absolute self-assessments if taking place under the hypothesis of similarity, and it can yield a negative impact on absolute self-assessment if the focus of comparison is on differences to this high standard, e.g. a very attractive person. The reverse pattern can be expected for downward comparisons: here, focusing on how one differs, say, from a rather unattractive person, may selectively render positive features of one's own body more accessible, just as may a focus on what one has in common with a rather attractive person.

Mussweiler (2001) experimentally tested and confirmed these assumptions by deliberately manipulating the focus of comparison. To this end, students were primed in advance with an image task to focus on "differences vs. similarities". It was assumed that such an instructed focus would also influence subsequent situations in the sense of a mindset. In this case, the follow-up situation was that the students heard about a first-year student who had settled into university life rather well vs. rather poorly and who thus served as an implicit comparison standard. The results show that students who were asked to focus on differences in the picture task rated their own adjustment to university life worse than those who compared themselves to a lower standard. Conversely, students who were primed to look for similarities in the picture task rated their own adjustment to university life more negatively when comparing to a low standard; those who sought similarities with a well-adjusted comparison person, on the other hand, rated their own adjustment to university life more positively (Mussweiler, 2001). This experiment thus illustrates and confirmed the interaction between comparison standard and comparison focus predicted by the model.

To our knowledge, the selective accessibility model has not yet been examined in the field of body-related self-esteem, and the present study aims to fill this gap. Yet, we will first review previous general research on social comparison process and body-related self-judgements.

Social comparison effects in the domain of body-related judgements

In a prototypical study, Engeln-Maddox (2005) asked female students to form an impression of models in advertisements and then complete a questionnaire about their individual body image. The results show that upward comparisons are significantly associated with a strong internalisation of the slim ideal and a negative body image. Contrary to expectations, encouraging critical reflection on the comparison (counterarguing) did not act as a protective factor. In a meta-analysis by Myers and Crowther (2009), the relationship between social comparisons and body dissatisfaction and its moderating variables was examined. Here, too, it was found that any social comparisons are associated with significantly higher body dissatisfaction. In addition, the effect was significantly stronger, and dissatisfaction was higher among women than among men.

The "thin ideal" is seen as a central aspect of body dissatisfaction among women. Ahern et al. (2011) conducted a qualitative study in which 41 female participants between the ages of 16 and 26 were asked in focus groups about their perception of the thin ideal and their own body image. The study showed that the participants were aware of the contradiction between constantly striving to be thin and knowing about the negative effects this has on physical and mental health. Strong effects of the "thin ideal" on body satisfaction were evident especially when women were frequently confronted with these ideals, for example through daily media consumption (Ahern et al., 2011).

Even in children's TV series and films, characters are often adapted to beauty ideals, and in social media for young adults, women are usually portrayed as juvenile and slim. In addition, it is typically suggested that only women who conform to these ideals lead successful and happy lives (Götz, 2022). A study by Klein (2013) investigated how ideals can lead to body dissatisfaction and eating disorders through social comparisons. The influences of advertising and social media were also compared. It was shown that the current advertising industry still uses the "thin ideal" and that women therefore strive for an unrealistic, often unattainable body image, but that social media leads to even greater internalisation of specific ideals. This is explained by the fact that social media presents an interplay between personalised advertising and real life, which reinforces the impact of the norm offered. People on social media platforms appear psychologically much closer and approachable than people in ad spots, series or movies, also because they include real friends, who, however, usually present themselves in the very best light (Ozimek, 2019). Thus, the social comparison standards seem more realistic

and within reach (Klein, 2013), and social media are often consumed daily, enhancing the risk of harm to self-esteem and the development of depressive symptoms (Ozimek, 2019). The discrepancy between the self and the person being compared can be exacerbated by the inaccessibility of the person being presented (Leinmüller, 2024). In contrast, only slightly upward comparisons or comparisons with average standards have a significantly lower negative impact on self-esteem (Kollmann, 2013).

In summary, numerous studies indicate that social comparisons with standards presented in the media – which usually strongly conform to attractiveness ideals – have an unfavourable effect on body image. Young women are typically confronted with a social ideal of unrealistic slimness, while young men face ideals of highly athletic bodies. On social media, friends' or friends-of-friends' photos suggest that such an appearance is achievable to practically everybody, much more than professional advertising models or actors do (Ozimek, 2019). The negative consequences for body satisfaction, self-esteem and mental health have been well researched. There is little evidence so far that awareness of these risks or explicit encouragement to critically examine high standards buffer the generally unfavourable effect of upward social comparisons. At the same time, experiments on Mussweiler's Selective Accessibility Model (2003) indicate that focus of comparison plays a decisive role in the process and should thus alter the resulting absolute self-assessment.

The experiment reported here aims to investigate whether a prior manipulation of comparison focus as used in respective studies may also influence body-related self-assessment after confrontation with highly vs. moderately attractive comparison standards, or whether – as predominantly reported in the literature – a general negative effect of high standards on self-assessment emerges.

Research question and hypotheses

The aim of the present study was to examine how implicit social comparison processes with models of varying attractiveness influence young women's body-related self-assessment and whether this effect is moderated by the focus of comparison as suggested in the Selective Accessibility Model (Mussweiler, 2001; 2003). Based on Festinger's theory (1954) and the findings summarised above, body-related self-assessments should be lower when participants are presented with a highly (vs. moderately) attractive comparison standard as a result of this upward comparison. In contrast, Mussweiler's model predicts an interaction between comparison standard (high vs. moderate) and the focus of comparison (selective search for similarities vs. differences), as the latter makes confirmatory evidence more cognitively accessible: If similarities are focused on, sought and thus found, a high standard should result in a more positive self-assessment than a moderately attractive standard, an assimilation effect. If the selective search focus is on dissimilarity, that pattern should reverse to a contrast effect and high standards should yield lower body-related self-assessment than moderately attractive standards.

3 Method

To test these two predictions against each other, a 2x2 factorial experimental design was implemented with the independent variables level of attractiveness of the presented comparison persons (high vs. moderate) and focus of comparison (similarities vs. differences). The dependent variable was body-related self-assessment as measured using two questionnaire scales.

Materials

To manipulate the focus of social comparison on similarities vs. differences, an image task was used that had already served as successful prime in the studies published by Mussweiler and Epstude (2009, here taken from Starzinger, 2015). The image shows a scene in the jungle. To clearly mark the two halves of the image, a narrow white bar was placed in the middle. Depending on the test conditions, the participants were instructed to look at the two halves of the image for a few minutes and to specifically look either for similarities or differences between the two halves and to write down at least five corresponding aspects in keywords in the free text field below. Typical responses included, for example, "There is a river in both pictures"; "Both pictures have a similar colour spectrum"; "Both pictures show a jungle"; or, in the difference condition, "The left side is more filled with things"; "The left side contains more green"; "The sky is not visible on the left". This also ensured that the task was completed carefully. Furthermore, the perceived similarity between the two halves of the image was to be rated on a scale of 1 to 10. This was meant to enhance the credibility of the cover story that it was all about perception styles (see below) and served as a manipulation check.

Four royalty-free images of young women were then shown, depicting young women who were above average in attractiveness or moderately attractive, depending on condition. The images were selected based on current literature on common beauty ideals of slimness, clear skin, facial symmetry and the like. Participants were asked to look at the images for a few minutes and then rate the attractiveness of the woman depicted on a scale from 0 (not at all attractive) to 100 (very attractive). Again, the rating served both to ensure careful consideration of the images and as a manipulation check. The procedure differed from the original Mussweiler (2001) study in so far as our participants were not explicitly asked to compare themselves with these models, as we were interested in assessing the consequences of somewhat more implicit comparisons in everyday situations.

Measurement

The dependent variable, body-related self-assessment, was operationalised using two scales: the Body Image Questionnaire FKB-20 (Clement & Löwe, 1996) and a version of the Rosenberg Self-Esteem Scale (Rosenberg, 1979; German translation by von Collani & Herzberg, 2003). The FKB-20 is one of the most frequently used scales for measuring body image and can be applied in both clinical and non-clinical samples. It consists of two subscales, each with ten items, which are answered on a five-point Likert scale (from

1 = not at all true to 2 = hardly true, 3 = somewhat true, 4 = very true to 5 = completely true). The "Rejecting Body Evaluation" subscale measures the subjective perception of one's own physical appearance and looks (e.g., "My physical flaws bother me a lot" or "I can live well with my physical imperfections" (r). Eight items are coded to indicate a negative attitude and two to indicate an accepting attitude, which are recoded accordingly before a total sum score is calculated. This score can range from 10 to 50, with high values reflecting a strongly negative body image. The internal consistency in the present sample was Cronbach's alpha = .90. The second subscale, "Vital Body Dynamics," measures physical well-being (e.g., "I have enough powerful tension in me" or "I am healthy") as irrelevant to the present purpose. Therefore, the subscale is not further analysed in this study, but its internal consistency of .80 is an additional indicator that the questionnaire was completed carefully. Only the "Rejecting Body Evaluation" subscale from the FKB-20 is used to test the hypotheses.

A slightly modified version of the German-language version of the Rosenberg Self-Esteem Scale by von Collani and Herzberg (2003) was used as a second measure of body-related self-esteem. Rosenberg originally developed the instrument to measure self-esteem among pupils, but it has since been used in numerous research contexts, target groups and subject areas and is considered highly reliable. It comprises ten items (e.g. "All in all, I am satisfied with myself" or "I feel really useless from time to time" (r)), which are to be answered on a four-point scale (1 = not at all true, 2 = partly true, 3 = true, and 4 = completely true). The total score can range from 10 to 40 (Rosenberg, 1979). Due to the widespread use of the RSES and because, to our knowledge, there is no specific scale for body-related self-esteem in German, we decided to use a slightly adapted version focusing on body aspects. The items were strictly based on the original and carefully reworded so that they solely refer to this area of self-esteem (e.g. "All in all, I am satisfied with my appearance" or "I feel really unattractive from time to time"; see Table A1 in Appendix A for a complete list of the original and the body-related items). The adaptation was carried out in close accordance with Bandura's (2006) instructions for constructing domain-specific self-efficacy scales. The ten adapted items showed very good internal consistency in the present sample with Cronbach's alpha = .92.

Sample

In accordance with the research question focusing on female adolescents, young women aged between 18 and 30 were specifically recruited to participate in an online questionnaire experiment. Recruitment took place via the first author's personal network and a request to share the link on social media. The study was accessed by a total of N = 354 people and completed by 175 people, corresponding to a completion rate of 49%. Ten people were excluded from the data analysis because they identified as male, and another five because they did not adequately complete the image task designed to induce the comparison focus (noting fewer than the requested five similarities or differences). This left a sample of n = 160 complete data sets, which distributed approximately equally across the four experimental conditions. Participants were aged between 18 and 30 (M = 22.06, SD = 2.51). The vast majority had obtained a high school degree allowing them to start college (91%, n = 147) or technical college (6%, n = 9), another 1% (n= 1) stated that they had a secondary school degree and 2% (n = 3) had no or other degrees. This represents an above-average educated, non-representative random sample of young women.

Implementation

The study was conducted online, which allowed for a high level of standardisation and eliminated confounding variables through test administration in person. At the same time, being confronted with people of varying attractiveness on the screen simulated real implicit comparisons during digital media consumption. The participants were first welcomed and asked to give their consent to participate and to the data handling guidelines. The purpose of the study was said to be an investigation of "the relationship between visual perception styles and attitudes".

After random assignment to one of the four experimental conditions, the jungle picture task was presented to prime comparison focus. Here, participants were asked to compare two halves of an image and, depending on the experimental condition, to look for similarities or differences and indicate them. They were then shown four images of above-average vs. average attractive young women and asked to rate these according to their attractiveness. The dependent variable, body-related self-assessment, was then measured using the FKB-20 in German and our adapted version of the Rosenberg Self-Esteem Scale. After collecting sociodemographic data, the participants were thanked, given a contact address for questions about the study, and informed of the possibility of receiving credit for participating in the study if desired. The study took a total of 20-25 minutes to complete. The data was collected in November 2024 via the questionnaire platform unipark.

4 Results

After cleaning the data-set according to previously defined standards (see above), manipulation checks were performed and the data were aggregated and prepared for hypothesis testing.

Preparatory analyses and manipulation checks

The items of the FKB-20 subscale "Rejecting Body Evaluation" and the adapted Rosenberg scale were recoded where necessary, checked for internal consistency and summarised in a total score. High values in rejecting body posture represent a negative body-related self-assessment, while high values on the adapted Rosenberg scale represent a positive body-related self-assessment. As expected, both dependent variables correlate highly significantly negatively with r (160) = -.88, p <.01, which also indicates good validity of our adapted Rosenberg scale, for which the Rejecting Body Evaluation subscale of the FKB-20 can be considered a meaningful (inverse) criterion variable.

To check whether the instruction to look for similarities vs. differences between the two halves of the jungle image activated the desired focus, the corresponding ratings were

examined. However, since participants in the similarity condition were asked to judge perceived similarity and those in the difference condition were asked to judge perceived dissimilarity, the values are not directly comparable. Both ratings were therefore tested using the one-sample t-test against the middle of the ten-point scale, i.e. the value 5.5. The results show that both the perceived similarity in the "find similarities" condition (M = 7.00, SD = 1.71; $t(81)$ = 7.92, p < .001) and the perceived dissimilarity in the condition "find differences" (M = 6.29, SD = 1.61; $t(77)$ = 4.35, p < .001) deviated significantly and in the intended direction from the midpoint of the scale, so the images were rated as above average in similarity or dissimilarity, respectively.

Similarly, the attractiveness ratings of the presented comparison persons on a scale from 0 to 100 allow for a manipulation check. Significantly higher values were found in the high comparison standard condition (M = 79.11, SD = 12.08) than in the moderate standard condition (M = 56.36, SD = 24.35). Because the variance turned out to be higher for moderate as compared to high standards (Levene's test F = 37.37, p < .01), the t-Test for samples with unequal variance was used, and it shows a highly significant difference ($t(117.78)$ = 7.52, p < .01). Accordingly, the comparison stimuli presented were perceived as intended. There were no differences in attractiveness ratings depending on comparison focus ($t(158)$ = 1.06, p = .29, n.s.) and no interaction between conditions (F < 1).

Hypothesis testing

To test the central hypothesis that social comparison with high (vs. moderate) standards has a negative global influence on one's own body-related self-assessment, or whether, as postulated in the Selective Accessibility Model, this main effect interacts with the focus on similarities vs. differences, a two-factor multivariate analysis of variance was conducted with the comparison standard (high vs. moderate) and comparison focus (similarities vs. differences) as independent factors and negative body evaluation and body-related self-esteem as dependent variables.

The main effect of comparison standard (high vs. moderate) is highly significant in this multivariate analysis (F(2, 155) = 5.59, eta^2 = .07 and p < .01). The main effect of comparison focus (similarities vs. differences) is statistically not significant (F(2, 155) = 1.85, eta^2 = .02, p = .16), and there is also no indication of an interaction between the two factors (F < 1). Separate analyses of the between-subject effects show a significant main effect of comparison standard in the expected direction for rejecting body evaluation (F = 7.63, eta^2 = .05, p < .01), values being higher after confrontation with a high standard. For the body-related self-esteem scale, there is also a tendency in the expected direction of lower values after comparison with a high standard. However, this effect is smaller and statistically only marginally significant (F = 2.41, eta^2 = .02, p = .06 (one-tailed)). The main effect of the comparison focus and the interaction effect are not significant for either dependent variable (all F < 1). The mean values and standard deviations according to experimental conditions are shown in Table 1.

Table 1: Mean values and standard deviations (in brackets) in the four experimental conditions

	High comparison standard		Moderate comparison standard	
Comparison focus	Similarities	Differences	Similarities	Differences
Rejecting body evaluation	29.87 (8,25)	29.85 (7,44)	26.85 (9,31)	25.75 (8.53)
Body-related self-esteem	27.18 (6,65)	25.93 (6,66)	28.31 (7,61)	28.22 (6,68)

In summary, it can be said that, according to Festinger's social comparison theory, body-related self-assessment was influenced by the level of the comparison standards a person has recently been confronted with: if a high comparison standard was shown, participants assessed their own body in a more negative way than in the condition in which moderate comparison standards were presented, though this difference was only marginally significant for body-related self-esteem. In contrast to the predictions of the Selective Accessibility Model (Mussweiler, 2001; 2003), assessments did not differ depending on the comparison focus on similarities vs. differences, which had been manipulated in close accordance with previous studies.

5 Discussion

Summary and interpretation of results

The data presented here are consistent with Festinger's (1954) social comparison theory and with previous research findings in the field: a high comparison standard suggests a discrepancy between the desired and actual state, which results in the person devaluing themselves with regard to the relevant characteristic, in this case the attractiveness of their own body (Engeln-Maddox, 2005; Suls & Wheeler, 2000). In the experiment reported here, there were no indications that the focus of the comparison process moderated this effect, as would have been predicted by Mussweiler's Selective Accessibility Model (2001; 2003). One might conclude that the pattern of results reported there may not be transferable to body-related self-assessment. It could be speculated that the areas in which the model's predictions have been confirmed so far are more malleable and thus more susceptible to experimental manipulations of available comparison standards (e.g., how well one adapted to university student life). In contrast, one is likely to have reflected more often and more deeply on one's own physical attractiveness before, rendering this domain eventually more robust against situational accessibility effects. On the other hand, our instruction did not correspond exactly to that of the original experiment (Mussweiler, 2001), and this may of course be at least in part responsible for divergent data patterns. In the original study, participants were explicitly instructed to assess themselves in direct comparison with the standard on the relevant dimension. In order to keep the situation more similar to comparisons in everyday life, no such explicit request was made in the present study, which might, however, have undermined some of the processes assumed in the Selective Accessibility Model.

As this is a cross-sectional study, it does not allow any conclusions about stability or dynamics of the dependent

variables (Kuß et al., 2014): It remains unclear how long the reported effects last, or whether repeated confrontations with high standards sum up in their negative effect, accumulate in a super-summative manner, or whether at some point in time it comes to habituation and / or deliberate distancing from ideals – possibly depending on further moderator variables. If the observed effects are mainly based on the cognitive accessibility of relevant standards, one might speculate on analogies with the internalisation of norms in other fields (such as aggression and violent behaviour, Anderson & Bushman, 2018). In the context of general learning models, it has been argued that repeated and frequent exposition to extreme stimuli may not only enhance their temporary accessibility as potential normative standard, but also lead to a chronic enhanced accessibility of these concepts and associated values or behaviours - that is, become an internalised part of one's personality. To examine these and related questions for the issue of body-related self-assessment would require longitudinal designs or at least assessing frequency and nature of (social) media consumption as a co-variate.

The size of the main effect of comparison standard varied in the two scales applied here. While the effect was significant in the FKB-20 subscale for Rejecting Body Evaluation, the Rosenberg Self-Esteem Scale as adapted to body-related aspects showed only a marginally significant effect, despite its solid internal consistency and high criterion validity. Accordingly, it is possible that the (relatively concrete) items reflecting accepting vs. rejecting evaluation of one's own body deteriorates more strongly through social comparisons with high standards than possibly somewhat more abstract body-related self-esteem. Rosenberg (1965) already argued that self-esteem is dynamic and changeable, but probably not so easily within the context of an experiment. However, there was a clear tendency in the expected direction, so it may rather be a matter of effect size than of fundamental susceptibility.

Regardless of the hypotheses tested here, the attractiveness ratings of the comparison standards, which were collected as a manipulation check, suggest that our young female participants have internalised normative ideals of beauty and slimness regardless of their own body-related assessments, and that they apply them to the evaluation of other women (Engeln-Maddox, 2005). In addition, in the present study, body-related self-esteem turned out as not particularly high, even among those participants who compared themselves to a moderate standard. This can be interpreted as a further indication that the body-related self-esteem of young women is generally vulnerable (Finne et al., 2020) and is also consistent with a strong internalisation of societal body ideals and the assumption that any kind of social comparison can negatively influence body-related self-esteem (Kollmann, 2013). However, a comparison with a control group without previous social comparisons would be necessary to safely draw such conclusions. Furthermore, results clearly indicate that high comparison standards, as typically omnipresent in (social) media, lead to a more rejecting evaluation of one's own body and in tendency to lower body-related self-esteem in young women.

Limitations

The data presented is based on a non-representative random sample of young women. Although the scope of the study was explicitly limited to this population, it is therefore not possible to analyse any gender or age differences in body-related self-assessment as a result of social comparison processes. Furthermore, the sample obtained is above average in terms of education, so that any milieu-related differences in media use and/or vulnerability to media-mediated social comparisons regarding body-related self-assessment could not be investigated. These socio-demographic factors should be continuously investigated in future research, as their impact is most likely also subject to social changes.

From a methodological point of view, the manipulation check used for the independent variable comparison focus on similarities vs. differences must be reviewed critically: In the similarities condition, perceived similarity was rated, while in the differences condition, perceived dissimilarity was rated. A direct comparison across conditions was therefore not possible and tests were conducted against the scale mid-point. This manipulation check could thus have been favoured by acquiescence. A bipolar scale with the endpoints "very dissimilar" to "very similar" identical for both conditions would have been more appropriate. Nevertheless, it is quite possible that the manipulation of focus was indeed successful but did not affect social comparison processes or the dependent variables, as the domain of one's own physical attractiveness is not susceptible to selective accessibility effects or confirmatory testing strategies.

We consider the randomised experimental design, the appropriate sample size, and the use of manipulations and dependent measures applied in previous studies on the topic to be strengths of the study.

Recommendations and outlook

With regard to intense media use on the one side and the negative consequences of frequent body-related upward comparisons for the development of eating disorders, body dysmorphic disorder, depression, and other mental health problems on the other side, there is an urgent need for action. Based on the literature and the data reported here, a general recommendation might be to use social comparisons more consciously. This essentially involves seeking out comparison figures who are similar to oneself and who represent a realistic standard. Although social comparison processes often happen subconsciously, according to Wood (1989), we are by no means their helpless victim: he argues that strong upward comparisons can be interrupted by becoming aware of them, and that comparisons with more similar people can promote positive self-assessments. Nevertheless, experiments aiming to test the impact of such interventions did not provide much support for notable positive effects.

Given the prevalence of social media and the omnipresent occasion for upward comparisons there, it seems mandatory to encourage young people in particular to consume media in moderate ways, as is recently being discussed in

European and national guidelines for stricter legal age limits, including suggestions for parental time limits, accompanied media use, and training kids systematically in critical media literacy. The social comparison stimuli presented on social media are unrealistically close to ideals and almost exclusively result in upward-oriented body-related comparisons. In contrast to advertising models or actresses in films and series, who also tend to conform to high beauty standards, it is also suggested that this standard is achievable for "normal" people. In addition, the portrayal of young women's bodies through beauty filters and targeted poses or post-processing of images can create a distorted perception of reality and unrealistic expectations. Here, too, it is important to promote critical awareness (Klein, 2013).

In the interests of sustainable prevention, we believe that, regardless of media education approaches and legal regulations, it is advisable to strengthen body-related self-esteem and an accepting attitude towards the body in children and young people at an early age. In different settings, like school, home, sports centres, and other places where kids hang out, young people could receive ongoing, age-appropriate support to think about the body ideals that society pushes, reflect critically on their own internalised ideas and peer group dynamics, and be empowered to develop their personal ideas about beauty and values that matter to their personal identity (Swami et al., 2010). It is far more ethical and economically beneficial to raise awareness among youngsters as well as parents, teachers and other staff in children's and youth facilities and to support them with professionally sound concepts and materials than to accept and later treat the increasing severity and prevalence of body-related mental illnesses.

In conclusion, we are convinced that every member of a social system contributes to what is considered 'normal', as descriptive norms emerge from what is shown and lived in public – including digital and media - spaces. Therefore, the responsibility for restoring healthy standards for the appearance of human bodies lies not only with teachers, parents or young people themselves. It also lies with those who select models for consumer advertising (the 2004 Dove campaign for "real beauty" was a milestone here, though for critical discussions, see e.g. Murray, 2013; Taylor et al., 2016). It lies with those who shape cultural assets such as comics, TV series and films and music idols, especially when these are aimed at a young audience. And not least, it lies with every individual who shares natural-realistic vs. intensively selected or edited photos on social media and thus becomes a co-creator of social norms.

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Appendix

Table A1: Adapted Rosenberg scale measuring body-related self-esteem (items in English)

Original items (v. Collani & Herzberg, 2003)	Body-related adapted items
All in all, I am satisfied with myself	All in all, I am satisfied with my appearance
Every now and then I think that I am worthless	Sometimes I think that I am not pretty
I have a number of good qualities	I have a number of attractive physical features
I can do many things just as well as most other people	In many ways, I look as good as other people
I fear there is not much I can be proud of	I'm afraid there isn't much about my body that I can be proud of
I feel really useless from time to time	I feel really unattractive from time to time.
I consider myself a valuable person; at least I am no less valuable than others	I consider myself an attractive person; at least I am no less attractive than others
I wish I could have more respect for myself	I wish I could have more respect for my appearance
All in all, I tend to think of myself as a failure	All in all, I tend to consider myself unattractive
I have found a positive attitude towards myself	I have found a positive attitude towards my body

Table A2: Adapted Rosenberg scale measuring body-related self-esteem (items in German)

Originalitems (v. Collani & Herzberg, 2003)	Körperbezogenen angepasste Items
Alles in allem bin ich mit mir selbst zufrieden	Alles in allem bin ich mit meinem Aussehen zufrieden
Hin und wieder denke ich, dass ich gar nichts tauge	Hin und wieder denke ich, dass ich gar nicht hübsch bin
Ich besitze eine Reihe guter Eigenschaften	Ich habe eine Reihe attraktiver Körpermerkmale
Ich kann vieles genauso gut, wie die meisten anderen Menschen auch	Ich sehe in vielen Aspekten so gut aus, wie andere Menschen auch
Ich fürchte, es gibt nicht viel, worauf ich stolz sein kann	Ich fürchte, es gibt an meinem Körper nicht viel, worauf ich stolz sein kann
Ich fühle mich von Zeit zu Zeit richtig nutzlos	Ich fühle mich von Zeit zu Zeit richtig unattraktiv.
Ich halte mich für einen wertvollen Menschen, jedenfalls bin ich nicht weniger wertvoll als andere auch	Ich halte mich für eine attraktive Person, jedenfalls bin ich nicht weniger attraktiv als andere auch
Ich wünschte, ich könnte vor mir selbst mehr Achtung haben	Ich wünschte, ich könnte vor meinem Erscheinungsbild mehr Achtung haben
Alles in allem neige ich dazu, mich für einen Versager zu halten	Alles in allem neige ich dazu, mich für nicht attraktiv zu halten
Ich habe eine positive Einstellung zu mir selbst gefunden	Ich habe eine positive Einstellung zu meinem Körper gefunden

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