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This picture does not portray reality: developing and testing a disclaimer for digitally enhanced pictures on social media appropriate for Austrian tweens and teens

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ABSTRACT

Research has shown that idealized beauty presented in mass media can have a detrimental effect on body satisfaction, and these idealized images often stem from digital alterations. Consequently, countries like France and Israel employ disclaimers that inform viewers about the use of such modifications. Previous research, primarily conducted with adult women, has pointed out that these disclaimers are ineffective in reducing the perceived realism of the presented images, leading to negative effects on women's body satisfaction. However, we know little about the effectiveness of such disclaimers for tweens and teens (TT). Using a two-study design, we firstly developed an adolescent-inspired disclaimer in two cocreation workshops with students ($N = 47$; aged 12–14 years). Secondly, we examined the effectiveness of this newly developed disclaimer in an experimental setting ($N = 186$; participants aged 10–19 years). We compared the new disclaimer to the existing one as well as to a condition in which there was no disclaimer. Results indicated that disclaimers are a rather unsuccessful way of disclosing the lack of realism of media images for TT, underlining the urgency of developing more effective media literacy measures.

Impact summary

a. Prior State of Knowledge: Beauty ideals are shaped by media, but these are often set using digitally altered images. Some countries employ disclaimers that inform viewers about alterations. Previous research indicates that these disclaimers are not effective in balancing detrimental effects of unrealistic beauty ideals among adults.

b. Novel Contributions: This study focuses on adolescents and considers image alterations on social media. In a cocreation workshop we developed a disclaimer with adolescents, which we employed in an experimental study. Results underline that disclaimers are rather unsuccessful in disclosing the lack of realism of media images.

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Supplemental data for this article can be accessed here.

c. Practical Implications: Disclaimers are not a sufficient media literacy measure. Yet, as young audiences are so frequently confronted with altered and perfected images (particularly online), it seems crucial to educate them about these practices in specific media literacy programs.

Introduction

People are constantly exposed to images presenting unattainable beauty ideals (Ward, 2016), especially in industrialized societies. Many of these portrayals are enhanced with airbrushing software, decreasing the realism of these pictures (Dumas, Maxwell Smith, Davis, & Giulietti, 2017). The current state of research indicates that idealized body norms, which are presented in mass media, have a negative impact on psychosocial health, and may result in negative body evaluations or even the development of eating disorders (Grabe, Ward, & Hyde, 2008; Ward, 2016). Young people entering puberty or those who are in puberty are considered to be particularly vulnerable. Due to the relevance of interpersonal relationships and shifts in cognitive capacities, adolescents (Callan, Kim, & Matthews, 2015, p. 196) are more open to social comparison (Festinger, 1954) than adults, potentially increasing the effects of mediated beauty ideals. Against this background, research including this age group and measures to develop media literacy to raise awareness for media-induced idealization is needed.

Disclaimers constitute one way of informing that idealized body representations do not portray reality (Tiggemann, Brown, & Anderberg, 2019). In particular, disclaimers could point out that a picture has been digitally enhanced, and, therefore, presents an idealized version of reality that is not attainable (Daldorph, 2017; Krawitz, 2014). Consequently, advertising images that have been digitally enhanced should be identified as such in order to prevent the negative effects of such pictures. The effectiveness of disclaimers on viewer's body image has been investigated in several studies (e.g., Ata, Thompson, & Small, 2013; Harrison & Hefner, 2014; Tiggemann & Brown, 2018). Although research on this topic yielded mixed results, most findings suggest that disclaimers are not effective in leveling out negative effects of idealized body representations on ones' self-assessment (e.g., Lewis, Pelled, & Tal-Or, 2020; Tiggemann & Brown, 2018).

The vast majority of studies investigated adult women (e.g., Ata et al., 2013; Bury, Tiggemann, & Slater, 2016b; Lewis et al., 2020; Tiggemann, Slater, Bury, Hawkins, & Firth, 2013; Tiggemann, Brown, Zaccardo, & Thomas, 2017, 2019), but research on disclaimer effects on tweens and teens (TT) has been rare (cf. Harrison & Hefner, 2014; Veldhuis, Konijn, & Seidell, 2014). Additionally, male participants are seldomly included in the examination of disclosure effects (cf. Harrison & Hefner, 2014). Men and boys, particularly heterosexual men, are an important group to research when investigating disclaimer effects for female images, because looking at these pictures can a) shape perceptions and expectations of how a potential partner is supposed to look and b) affect their own body perception (Trekels, Vangeel, & Eggermont, 2017; Vandenbosch, Driesmans, Trekels, & Eggermont, 2017). Hence, including the male perspective on whether disclosures are effective in countering this perceived exaggeration or idealization is a valid endeavor (Trekels et al., 2017).

Previous researchers have almost exclusively studied disclaimers in print journals (e.g., Ata et al., 2013; Frederick, Sandhu, Scott, & Akbari, 2016; Tiggemann et al., 2013, 2017, 2019), and study findings on the impact of disclaimers in a social media context are still rare (cf. Fardouly & Holland, 2018). Yet, social media content can potentially exert great appearance-related pressure on users (Schmuck, Karsay, Matthes, & Stevic, 2019), which might even exceed the effects of print advertising. Compared to models in advertising, social media communicates the lives and self-presentation of peers or users who might be perceived as peers (e.g., influencers). This particularity of social media creates the illusion that theoretically, it is attainable for everybody to look as good as the pictures on social media platforms (Kleemans, Daalmans, Carbaat, & Anschütz, 2018; Tiggemann & Zinoviev, 2019). While adolescence might be able to distinguish alterations from reality among close friends, applying a theoretical awareness of filter and appearance alteration (Terán, Yan, & Aubrey, 2020) on pictures of unknown persons might be much more difficult (Kleemans et al., 2018). The present study sought to address these research gaps by a) *developing* and b) *testing an adolescent-inspired disclaimer* for digitally enhanced pictures in a *social media context*.

Disclaimer practices for digitally enhanced pictures

A substantial body of research has delivered evidence that thin idealized media images can standardize the ideal of beauty (e.g., Yan & Bissell, 2014) and negatively affect women's body satisfaction (e.g., Ward, 2016). Given these potential negative effects, creating awareness for media-induced self-assessments is relevant to the general public and important in developing measures that policymakers can implement. As a result, in Israel, regulators passed the so-called "Photoshop Law," requiring models who participate in photo shoots to exceed a body mass index (BMI) of 18.5. Moreover, if a picture was digitally enhanced to make the model appear thinner, "The images must state that they were enhanced and the reasons why. The statement must feature prominently, taking up a minimum of seven percent of the entire image" (Krawitz, 2014, p. 868). France followed with a similar law in 2017 (Daldorph, 2017). Such disclaimers for digitally enhanced images could be a cost-effective and an easily implementable way of an intervention to alert the general public.

A disclaimer should make media users aware that the image they see does not portray reality, and hence, does not provide an appropriate target of comparison (Tiggemann et al., 2013, 2019). This assumption is based on social comparison theory (Festinger, 1954), which postulates that other individuals and images transported via mass media serve as standards for individual comparison . In a body image context, it is assumed that if individuals compare themselves to idealized images, they will most likely fall short in this comparison and feel dissatisfied with their bodies (Kleemans et al., 2018; Want, 2009). Research has shown that negative consequences arise from upward comparisons (comparing with someone superior to oneself) (e.g., De Vries, Möller, Wieringa, Eigenraam, & Hamelink, 2018; Schmuck et al., 2019), especially when the comparison standard is deemed as unattainable (e.g., Knobloch-Westerwick & Romero, 2011). The problem is that due to the digital enhancement of the presented pictures on social media, these images are neither realistic nor attainable. The idea of disclaimers holds that viewers

should be made aware of the unattainability of the presented images (e.g., Tiggemann et al., 2013) and subsequently should avoid making an unsatisfactory upward comparison.

Effectiveness of disclaimers

Despite this intuitive idea of a disclaimer to raise the viewers' awareness of the unattainability of the depicted image, there is little empirical evidence that disclaimers can live up to this intention. Research on this topic has determined that such disclaimers do not protect young women against an increase in body dissatisfaction triggered through exposure to idealized images (e.g., Ata et al., 2013; Bury et al., 2016b; Tiggemann et al., 2017, 2019). Indeed, the disclaimers might even backfire and increase the desire of women to look like the women in the altered pictures (see Bissell 2006 quoted from Harrison & Hefner, 2014).

Hence, applying the media literacy acquired by a disclosure statement in the evaluation of content seems to be difficult. Along the same lines, Harrison and Hefner (2014) showcased that interventions notifying adolescents that images have been digitally altered could activate a boomerang effect and thus lead to more body insecurities. These results are, however, contrasted by the study results of Veldhuis et al. (2014) who tested different disclaimer types of raising weight awareness for adolescents (12-to-18-year-old girls) and found them to be beneficial if the disclaimers informed adolescents in an objective manner about thin body ideals.

While adolescents might be particularly vulnerable to social comparison mechanisms (Callan et al., 2015), it seems especially important to extend the body of literature on how they respond to disclaimers, particularly if these are fitted to their needs. Hence, we see the need to investigate the effectiveness of disclaimers for TT.

Disclaimer characteristics

As pointed out above, disclaimers following along the line of "This image has been digitally enhanced," have not been proven to be effective for a female adult audience (e.g., Frederick et al., 2016; Tiggemann et al., 2013). In addition, the findings from one study investigating adolescent girls (Veldhuis et al., 2014) gives reason to doubt the effectiveness of the disclaimer strategy, as only certain ones (namely, informative disclaimers) seem to be effective in reducing girls' dissatisfaction with their bodies.

Yet, the main idea behind the disclaimer is to spark a perceived awareness that the image is not portraying reality among the audience (Tiggemann et al., 2019). In our study, we want to examine the role of a new target group in the disclaimer literature by investigating TT, and dissect the characteristics of a disclaimer that might be relevant for a successful implementation.

Developing an appropriate disclaimer for TT

Our first study follows an explorative logic that aims to examine whether the TT deem the established forms of disclaiming that an image has been digitally enhanced as appropriate for their peers. Furthermore, the TT were asked to design an ideal disclaimer appropriate for their age group (De Jans et al., 2018). This procedure builds on

a community-based media literacy approach that considers the skills and capabilities of the target group and their own capabilities of understanding and problem solving (Bergsma, 2004). This approach engages the intended community to ensure that the disclaimer has a clear meaning to them (De Jans et al., 2018); otherwise, it cannot serve its purpose and its utility is low (Wogalter & Laughery, 1996). Based on warning sign and label effectiveness research, we regard the following characteristics as important: salience, wording, and pictorial symbols (Wogalter, Conzola, & Smith-Jackson, 2002; Wogalter & Laughery, 1996). Salience, which is characterized by color, size, and positioning, is considered fundamental, as it is connected to the likelihood of reading and recall of the warning label. The wording is important to convey the meaning of the warning label, while the employed pictorial symbols underline the meaning and support salience and noticeability (Wogalter et al., 2002). Hence, the first research question of our study asks:

RQ1: What does an effective disclaimer for the TT look like according to the tweens and teens?

Study 1

Method

We conducted a cocreation workshop in two schools in Vienna, Austria. This workshop was designed to make use of the creativity of a group of people, which was bundled to arrive at a final product (De Jans et al., 2018). We had two main objectives: Firstly, we wanted to gain insights into the young media users' awareness of digitally altered images, as well as their view on how they think media presentations affect them. Hence, part of the workshop's aim was to raise media literacy for boys and girls. Secondly, after a thorough reflection on the topic, the other objective of the workshop was to develop a disclaimer, which the participants would deem appropriate to explain that a picture had been digitally enhanced by their peers.

Participants

In two schools, we recruited a group of TT (school A: 26 students, 14 girls; school B: 21 students, 10 girls). In total 47 students (24 girls) participated in the workshop. The students were in sixth and seventh grade and between 12 and 14 years old.

Procedure

We planned the cocreation workshop in close cooperation with one teacher from each participating school. The school administration and a Viennese governmental office focusing on women's health and literacy approved the workshop. We organized the workshop to fit into a timeframe of approximately 2.5 hours. The main objective was to reflect on the prevalent appearance ideals in social media and to develop a sensible and

understandable disclaimer to prevent potential negative effects on the TT's self-image. In fall 2018, two of the authors visited the schools to conduct the workshops.

In the first part, the participating students were introduced to the topic. The guiding question for the introduction section was: "How do users decide what images are posted on social media platforms and how do these images affect us?" The second part started by asking the students what means of digitally enhanced pictures they were aware of. Subsequently, the students were shown a video depicting a photo shoot and image alterations. In particular, the video intended to draw attention to the fact that not only can appearance be changed with the help of makeup and styling, but digital retouching also plays a central role. In an exercise, students could use their acquired knowledge by judging the ways in which several images had been enhanced.

In the third and final part, we discussed the role of disclaimers. We showed the students disclaimers employed in France and Israel (Daldorph, 2017; Krawitz, 2014). The students were then given an assignment to develop a disclaimer in small groups of four to five students. We instructed them to develop a disclaimer they deemed to be attention-grabbing, understandable, and effective for their peers. For this purpose, elements were presented that had to be considered in the design: the color, size, and position of the disclaimer as well as the text and a possible symbol to accompany the disclaimer (e.g., Wogalter et al., 2002). We instructed the students to draw their suggested disclaimers directly on a printed image that we brought to class. Afterwards, the suggestions were presented to the class in a gallery setting. All students were able to look at the individual suggestions and were asked to indicate the newly-designed disclaimer they deemed to be the most comprehensible and effective for their peers.

Analysis strategy

To assess the results of the workshop we used two types of materials. First, we examined the workshop products that could be used as a basis for the analysis. Second, both authors conducting the workshop took notes during the classroom discussions, and the results are based on several readings of the notes and the workshop products. The analysis strategy followed the aim of answering the first workshop goal (i.e., insights into adolescents' reflection on social media use and altering). The analysis strategy for the disclaimer proposal was based on previously defined disclaimer characteristics of *color, size, position, text*, and *symbols* (e.g., Wogalter et al., 2002). In our final analysis step, we incorporated the students' evaluations of the newly designed disclaimers.

Results

Reflection on picture alterations

Regarding the recognition of the image altering measures, we found that rather obtrusive ways of altering a picture, for example, adding bunny ears with a filter, were easy to spot for the participants. More subtle ways of enhancing images like teeth whitening, skin smoothing, and figure alterations, were more difficult for the students to identify, although they had previously been informed about such techniques.

Development of a comprehensible disclaimer

The participating students believed that the existing disclaimers were too vague and difficult to understand. They agreed that other tweens or teens their age would have problems recognizing what was meant by such a disclaimer if it were presented on an image. In small groups, they then developed their suggestions. We had six proposals from School A and five proposals from School B, resulting in eleven disclaimer suggestions.

Color, size, position

The developed disclaimers were much easier to spot than the existing disclaimers, as the students chose to work with vibrant colors like yellow or red. Similar to the Israel legislation (Krawitz, 2014, p. 868), our students aimed at visible disclosure sizes without dominating the picture, typically taking up around 10% of the picture. Furthermore, the disclaimers were positioned either on the upper right or lower right corner of the image.

Symbols

Most suggestions for a disclaimer incorporated some kind of warning symbol. Most frequently, students used a triangle as commonly recognized from warning signs (e.g., in traffic). Furthermore, most of the suggestions included an exclamation mark as an additional symbol to raise attention.

Wording

The students mentioned that the existing text was too abstract to adequately inform their peers. They preferred the disclaimer to point out that the picture does not portray reality as it was digitally enhanced. They proposed sentences such as, "Attention, this picture does not portray reality!" or "Attention! Photoshopped!" The most frequently used message in all eleven suggestions referred to the lack of realism of the picture. Hence, the students opted for more explicit wording in their disclaimer.

Evaluation

We asked the students to vote for one of the proposed disclaimers that they felt was the most comprehensible for their peers. For School A, the most popular disclaimer with eight votes portrayed a red triangle with a computer in the center and the accompanying text, "This image has been digitally enhanced." The runner-up disclaimer with seven votes presented a triangle with an exclamation mark inside, and the text, "This image has been digitally enhanced" as well as a computer symbol. In third place with six votes was a disclaimer presenting the text: "This image does not portray reality – It's not real." Furthermore, the students drew an image of a mobile phone in a yellow triangle, which was crossed out. In School B, the most well-liked disclaimer with 18 out of 21 votes displayed a yellow triangle with an exclamation mark in the middle accompanied by the text "Attention! Photoshopped!"

Conclusion

Overall, we found that although there was sufficient prior knowledge about picture alteration techniques, the ability to recognize such measures was rather moderate (similarly to results by Kleemans et al., 2018). With regard to the presented disclaimer, it

became clear that prominent colors and easily comprehensible symbols were important to the participating students to increase the comprehensibility and visibility of the disclaimers. Size and position followed the established disclaimer types (Krawitz, 2014, p. 868). Regarding the text, they most frequently suggested a sentence along the line of, "This picture does not portray reality." Form the students' perspective, this sentence was informative (Veldhuis et al., 2014), and conveyed a clear message.

To develop a new, age-adequate disclaimer, we drew on the results of this cocreation workshop, by combining the elements of the eleven disclaimers drafted by the students. Particularly, we integrated three elements: a warning symbol, prominent colors, and a comprehensible text. Thus, the triangle displayed in most of the suggestions was chosen as well as the exclamation sign in the middle of this triangle. We chose to color the triangle yellow to grab the viewers' attention. For the text, we opted for the most frequently used sentence, "This picture doesn't portray reality." With regard to position and size, we followed the previously established guidelines.

Testing the appropriateness of a tween and teen disclaimer

In a follow-up study, we aimed to examine whether our newly developed disclaimer was effective in debunking unrealistic beauty images. As previously mentioned, traditional disclaimers used in some countries have not proven to be overly effective (e.g., Lewis et al., 2020). Thus, our goal was to compare the effectiveness of these traditional disclaimers to the one inspired by the designs of the TT.

For a disclaimer to be successful in levering negative effects of unrealistic beauty ideals, it should highlight the lack of realism in the presented images to evaluate them as a valid comparison target (Kleemans et al., 2018; Tiggemann & Brown, 2018; Tiggemann et al., 2013, 2019). Therefore, if effective, a disclaimer should alter the individual's perception of beauty images as realistic and attainable. In past studies, this perception of media images was conceptualized as "perceived realism" (e.g., Tiggemann et al., 2013), which should be decreased by the use of a disclaimer, when compared to the same images without disclaimers. Based on the main idea of a disclaimer and independent of the lack of effect found in studies conducted with adult women, we assumed that the presence of a disclaimer was more effective than no disclaimer at all. However, we had no basis to assume that the newly developed disclaimer was more effective than the traditional one. Therefore, we present a hypothesis followed by a research question:

H1: The TT will react to idealized images with lower perceived realism if *a)* the existing disclaimer and *b)* the newly developed adolescent-inspired disclaimer are presented as compared to idealized depictions with no disclaimer.

RQ2: Is the newly developed adolescent-inspired disclaimer more effective in decreasing the perceived realism of idealized images compared to the existing disclaimer?

Based on the assumption that a disclaimer should decrease perceived realism (Tiggemann et al., 2013, 2019), adolescents should be less inclined to compare themselves with the portrayed images (Festinger, 1954), and body satisfaction should not be affected

negatively (or at least compared to a non-disclaimer scenario). In other words, we assume that if the TT realize that the presented images do not represent reality and are hence an inadequate reference for comparison, it would positively affect their self-assessment. In this context, Arendt, Peter, and Beck (2017) show that raising awareness of artificiality in advertisements through retouching decreases social comparison to these images. A decrease in perceived realism leads back to the fact that disclaimers should, therefore, hinder negative effects of idealized images on the viewers' body dissatisfaction (e.g., Bury et al., 2016b; Tiggemann & Brown, 2018).

H2: The effect of a disclosure on body dissatisfaction is mediated by perceived realism.

Study 2

To examine whether the newly developed disclaimer would be more effective than the existing disclaimer, we tested both in an experimental design. We compared a control group with no disclaimer to a group that received the existing disclaimer and another group that received the newly developed adolescent-inspired disclaimer.[1]

Participants and procedure

For this survey experiment, we recruited $N = 186$ TT (46.2% boys) from the ages of 10 to 19 years ($M = 15.25$ years; $SD = 2.72$) via a market research institute.[2] The questionnaire was then completed by the TT. The participants first answered questions regarding their social media use, their selfie behavior, and their self-esteem. After that, they randomly viewed one of our three experimental conditions. Subsequently, we assessed the dependent variables and we extensively debriefed the participants.

Stimulus material

We informed participants that they would be presented a range of pictures similar to those that they regularly encounter on social media sites. We then showed them four individual pictures of four different girls (see an overview of the stimuli in the appendix). Only images of girls were showcased, as boys are also affected by idealized presentations of females (Vandenbosch et al., 2017). These girls were around the same age as the examined target group (approximately 16 years old). The posts featured at least three-quarters of a thin and attractive model's body. Depending on the condition, our participants either saw these four pictures without a disclaimer (control group; $n = 62$); with a first disclaimer condition based on existing disclaimer practices stating, "This image has been digitally enhanced" (existing disclaimer condition, e.g., Tiggemann et al., 2013, $n = 62$); or they were confronted with the four pictures and our newly developed disclaimer reading, "This picture does not portray reality" (adolescent-inspired disclaimer condition, $n = 62$).

Measures[3]

Attention

To assess whether the TT were able to better recognize the new adolescent-inspired disclaimer compared to the existing disclaimer, we conducted an attention test. For this purpose, we showed participants our three condition versions and asked them to pick the one they thought they had previously seen. If they picked the correct condition, we coded their answer as = 1 (n = 113; 60.8%); if they picked the wrong picture or stated that they could not remember, we coded their answer as = 0 (n = 73; 39.2%).

Perceived realism

As our mediator, we assessed perceived realism based on existing measures by Tiggemann et al. (2013). Participants rated their agreement with three statements (e.g., "The girls in the pictures look like they would in person") on a 4-point scale (1 = I don't agree at all; 4 = I completely agree; α = .80; M = 2.30; SD = 0.73).

Body satisfaction

As our dependent variable, we assessed adolescents' body satisfaction with a single-item measure (based on Heinberg & Thompson, 1995). We asked participants to indicate on a digital visual analogue scale (VAS) the extent to which they were satisfied with their bodies (0 = not at all satisfied to 100 = very satisfied; M = 69.27; SD = 22.09).

Covariates

As our covariates, we assessed adolescents' body mass index (BMI), age, gender, social media use (based on previously employed control variables e.g., Tiggemann et al., 2017) and their initial body satisfaction (pre-stimulus exposure, e.g., Tiggemann et al., 2017, 2019). These variables were equally distributed over the three conditions. The participants' BMI was computed with their self-reported weight and height (ranging from 11.55 to 35.92; M = 20.46; SD = 3.93). We assessed social media use as a summated index of Instagram, YouTube, Facebook, TikTok, WhatsApp, and Snapchat use (assessed on a scale from 1 = never to 6 = a few times a day; M = 21.26; SD = 5.64). We measured participants' initial body satisfaction with the same single-item assessment as described above (M = 68.67; SD = 22.47).

Results

Attention

Our attention check regarding the recognizability of the disclaimer showed that TT in the traditional-disclaimer condition group had the hardest time recognizing the disclaimer with only 45.2% (n = 28) of participants correctly indicating the right conditions. For the control condition, 74.2% (n = 46) correctly recognized that they had seen no disclaimer, while for the adolescent-inspired disclaimer recognizability was at 62.9% (n = 39). A logistic regression highlighted that while the control condition and the adolescent-inspired disclaimer condition did not differ from each other with regard to recognizability (b = −.53; SE = .39; $Wald$ = 1.81, p = .178), the new adolescent-inspired disclaimer was significantly better recognized compared to the existing disclaimer (b = .72; SE = .36;

Table 1. Descriptive analysis of the attention check (dummy coded, 1 = recognized); M and SD for the employed mediator perceived realism (assessed on a 4-point scale) and the dependent variable body satisfaction (assessed on a 100-point scale).

		Successful attention check		Perceived realism		Body satisfaction	
Group	n	n	%	M	SD	M	SD
Control Group (No Disclaimer)	62	46	74.2	2.27	0.73	73.77	19.77
Existing Disclaimer Condition	62	28	45.2	2.41	0.76	69.35	23.08
Adolescent-Inspired Disclaimer Condition	62	39	62.9	2.20	0.70	64.68	22.66
TOTAL	186	113	60.8	2.30	0.73	69.27	22.09

Wald = 3.89, *p* = .049). Furthermore, the existing disclaimer was less recognizable compared to the control group (*b* = −1.25; *SE* = .39; *Wald* = 10.46, *p* = .001).

Statistical model

We tested our proposed mediation model with body satisfaction as the dependent variable. We treated perceived realism as the mediator, using SPSS Macro PROCESS, Model 4 involving 1,000 bootstrap samples (Hayes, 2017). Furthermore, we included adolescents' BMI, age, and gender, their social media use and their initial body satisfaction (pre-stimulus exposure) as our covariates. We treated the control group showing no disclaimer as our reference group.

Table 1 presents an overview of the descriptive results of the attention check and the mean values for all groups on perceived realism and body satisfaction.

Perceived realism

Contrary to our first hypothesis (H1), we did not find a main effect of the disclaimer conditions on perceived realism compared to the control group. There was no main effect on perceived realism of the existing disclaimer compared to the control group (*b* = 0.15, *p* = .268; LLCI = −0.12; ULCI = 0.41). Furthermore, the new adolescent-inspired disclaimer condition did not significantly decrease perceived realism compared to the control group (*b* = −0.06, *p* = .656; LLCI = −0.33; ULCI = 0.21). As seen in Table 1, participants in the newly designed disclaimer group reported the lowest perceived realism, but as these differences were not significant, we rejected H1.

To examine RQ1 we calculated the same model but this time treated the existing disclaimer as our reference group. We found no difference between the adolescent-inspired disclaimer condition and the existing disclaimer condition (*b* = −0.21, *p* = .123; LLCI = −0.47; ULCI = 0.06).

Body satisfaction

We found no direct effects of our conditions on body satisfaction. Accordingly, the adolescent-inspired disclaimer did not increase body satisfaction compared to the control group (*b* = −1.66, *p* = .230; LLCI = −4.36; ULCI = 1.06). The existing disclaimer condition only marginally differed from the control group (*b* = −2.56, *p* = .062; LLCI = −5.25; ULCI = 0.13). In addition to initial body satisfaction (*b* = 0.91, *p* < .001; LLCI = 0.86; ULCI = 0.97), perceived realism negatively predicted body satisfaction (*b* = −2.15, *p* = .005; LLCI = −3.66; ULCI = −0.634). Thus, if TT assessed the portrayed images as realistic, it significantly decreased their satisfaction with their own bodies. Adolescents'

Table 2. Moderated mediation model.

	Perceived realism		Body satisfaction	
	b	SE	b	SE
Existing Disclaimer Condition	0.15	0.13	−2.56[+]	1.36
Adolescent-Inspired Disclaimer Condition	−0.06	0.13	−1.66	1.37
Age	−0.02	0.03	−0.11	0.26
Sex, Male	0.02	0.11	1.14	1.13
BMI	0.02	0.02	−0.01	0.18
Social Media Use	−0.00	0.01	−0.03	0.11
Pre-Assessed Body Satisfaction	0.00	0.00	**0.91*****	**0.03**
Perceived Realism			**−2.15****	**0.76**
Explained Variance	*.02*		*.89*	

SPSS Macro PROCESS, Model 4 involving 1,000 bootstrap samples; Control group treated as a reference group; $N = 186$; ***$p < .001$; **$p < .01$; *$p < .05$; [+]$p < .07$.

gender, age, BMI, and social media use did not predict body satisfaction. For all results in detail, see Table 2. Additionally, to assess for a possible within-subject effect of the pre- and post-measure of body satisfaction, we calculated a repeated measure general linear model. However, we found no within-subject effects for body satisfaction, $F(1, 183) = 1.11$, $p = .294$, $\eta^2 = .006$, nor did we find an interaction effect of the disclaimer group and the within-subject factor, $F(2, 183) = 2.08$, $p = .128$, $\eta^2 = .022$.

With regard to the mediation path assumed in H2, we did not observe the assumed positive effect on body satisfaction of the disclaimer conditions compared to the control group via perceived realism. There was no significant correlation of perceived realism and body satisfaction: $r = −.06$; $p = 0.392$.

Additional analyses

We conducted three additional analyses. First, we wanted to examine whether our results would change if we examined female participants only, because the stimuli only showed pictures of girls. Second, we tested whether the results would change if we only examined the effects for those who indicated the correct picture in the attentional check. Third, we wanted to examine whether a positive effect of the disclaimer might at least be observable for some participants and, therefore, we examined the role of adolescents' self-presentations, namely taking selfies. The premise was that adolescents who take selfies frequently might differ in their assessment of perceived realism and body satisfaction compared to adolescents who did not take selfies regularly, as adolescents' selfie practices have been related to self-objectification and body shame (Terán et al., 2020).

Our first additional analysis replicated the model described above but was only calculated with our female participants ($N = 100$). We found no differences between the experimental conditions regarding perceived realism. However, we found that the marginally significant difference between the control condition and the existing disclaimer condition reached the threshold of significance ($b = −2.95$, $p = .049$; LLCI = −7.85; ULCI = −0.02). Girls who saw the existing disclaimer slightly decreased their body satisfaction compared to the control group. This finding points to a potential boomerang effect (Harrison & Hefner, 2014) of the existing disclosure, which has been described in studies with adult women (Bury, Tiggemann, & Slater, 2016a).
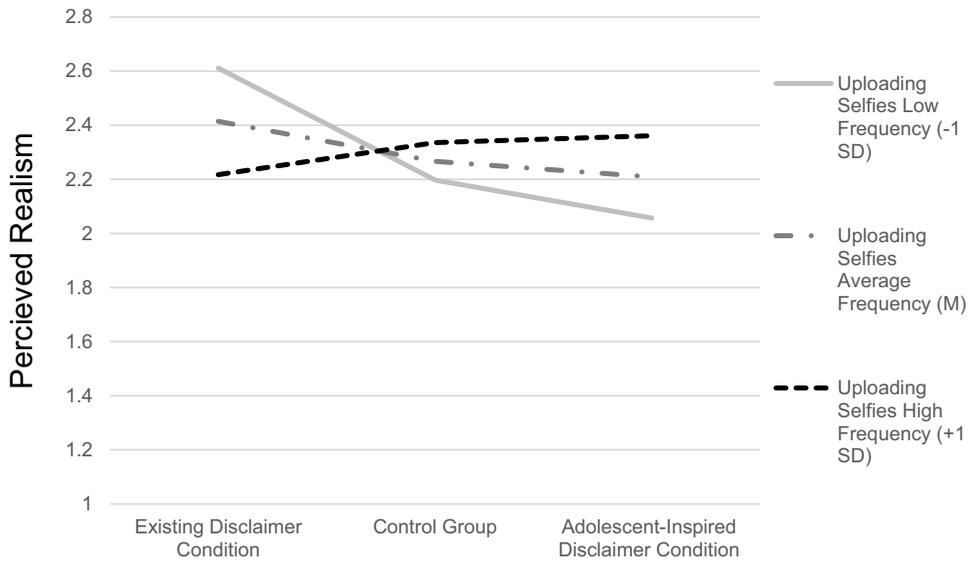
Figure 1. Interaction effect of the conditions and the frequency of uploading selfies online.

In our second analysis we again calculated the same model, this time only considering those who indicated the correct picture in the attention check ($N = 113$). No additional or different results reported to the main model in Table 1 were observed.

In our third additional analysis, we used the full sample ($N = 186$). As our moderator variable, we assessed adolescents' frequency of uploading selfies online. Answers ranged from 1 = never to 6 = a few times a day ($M = 2.48$; $SD = 1.40$). We conducted a moderated mediation model using SPSS Macro PROCESS, Model 7 involving 1,000 bootstrap samples (Hayes, 2017). The employed moderator of uploading selfies was mean-centered. All other variables remained constant to the described model above. We did not find a conditional main effect of uploading selfies on perceived realism ($b = -0.14$, $p = .084$; LLCI = -0.30; ULCI = 0.02).

However, we observed a moderation effect of uploading selfies and the adolescent-inspired disclaimer condition compared to the existing disclaimer condition ($b = 0.25$, $p = .013$; LLCI = 0.05; ULCI = 0.45). The interaction of uploading selfies and the control condition in comparison to the existing disclaimer did not reach significance ($b = 0.19$, $p = .058$; LLCI = -0.01; ULCI = 0.39). We plotted the interaction effect of condition and uploading selfies to explain the observed moderation. As seen in Figure 1, adolescents who do not upload selfies or who seldom did so (-1 SD and M selfie frequency) significantly decreased their perceived realism under the newly developed adolescent-inspired disclaimer condition compared to the existing disclaimer. However, perceived realism remained nearly unaffected for TT who uploaded selfies rather frequently ($+1$ SD). Hence, for TT with low levels of uploading selfies, the decrease in perceived realism positively affected their body satisfaction ($b = 1.19$; SE = .60; LLCI = .26; ULCI = 2.52). This mediation path was only observed in comparison to the existing disclaimer condition and did not uphold in comparison to the participants of the control group who were not presented a disclaimer.

Discussion

The results of Study 2 indicated that the assumed potential of disclaimers on idealized images is indeed rather limited (e.g., Harrison & Hefner, 2014; Tiggemann et al., 2013, 2017, 2019). Neither the existing nor the newly developed adolescent-inspired disclaimer had the potential to decrease the perceived realism of the presented images compared to a control group showing no disclaimers. Only when including tweens' and teens' media practices in the form of uploading selfies as a moderator (Terán et al., 2020), did we observe a somewhat positive impact of the newly applied disclaimer, but only in comparison to the existing disclaimer.

General discussion

Research has shown that unattainable body ideals presented in the media can have a detrimental effect on young people's body image (e.g., Grabe et al., 2008). Furthermore, technological advancements have exacerbated this problem, as the increasing availability of smartphones has made social media platforms and their content part of children's and adolescents' everyday lives. The logic of these platforms, in which close friends, personal acquaintances, and celebrities/idols appear side by side, gives users the impression that all content is realistic and attainable (De Vries et al., 2018; Kleemans et al., 2018). Accordingly, the goal of this multi-study approach was to test the effectiveness of disclaimers to hinder the negative effects of idealized images on TT and raise awareness to the lack of realism of these images.

Both of our studies showed that TT already have experiences with social media platforms and especially with image enhancing techniques. Looking at additional results of the second study, of all participants reporting to actively post pictures of themselves on social media ($n = 136$; 73% of our sample), about 84% indicated that they have altered some of those pictures in some way. Interestingly, despite this "experience" with picture alterations, the cocreation workshops revealed a rather moderate ability to recognize and reflect on such practices. Thus, critically applying knowledge of these practices seems rather difficult for TT (Kleemans et al., 2018).

This was further confirmed by the fact that overall, only a little more than half of the participants in Study 2 that saw pictures with disclaimers correctly remembered to have seen them. However, the adolescent-inspired disclaimer developed in Study 1 was better recognized than the traditional disclaimer that is used in countries such as Israel and France (Daldorph, 2017; Krawitz, 2014). Hence, our results indicate that one reason disclaimers might have been proven to be rather ineffective in the past may be because they are too unobtrusive und simply not acknowledged by recipients. Here, it is important to focus on disclaimer visibility in the future (see results of an eye-tracking study, Bury et al., 2016a), even if this interferes to a certain extent with the aesthetics of the pictures.

However, even for the newly designed, more obtrusive disclaimer, we found only limited effects on perceived realism and, in turn, body satisfaction. In light of the self-reported picture editing among this age group, the lack of disclaimer effects indicates that image processing may already be strongly anchored in the consciousness of TT, and that it is not judged to be artificial or unrealistic. As it is common to employ picture modification on social media apps, through filters that perfect the appearance of the user in images

and videos, it is concerning that young people have internalized these social media practices to such an extent that for them this is deemed natural (Dumas et al., 2017).

Our results, however, differed for some participants. While we found presumed effects for participants who never or rarely posted selfies, active selfie-users were not affected by the disclaimers. Since the vast majority of our participants reported to use such image processing techniques on their photos, the disclaimer highlighting that those pictures were not real could have been perceived as an attack on their body representation. In addition, those adolescents might presume an effect of these disclaimers on others and fear that they will look at their pictures differently. Of all participants who reported to post pictures of themselves, more than 90% agreed at least somewhat with the statement, "I think a lot about what others will think of my selfie."

Limitations

Our studies come with some limitations that merit discussion. One pressing issue is that we examined short-term, forced-exposure effects of disclaimers. We did confront our participants with four consecutive pictures to simulate cumulative effects, but this experience differs from how such pictures are encountered in everyday social media use (Appel, Gerlach, & Crusius, 2016).

Moreover, we showed our young participants idealized pictures of unknown girls and only girls. Since boys and men are also affected by body perceptions of female representations (Vandenbosch et al., 2017), including images of men would be a relevant addition to the literature. The non-existent relationship between the portrayed girls and the audience, however, is not easy to resolve as the social media environment is highly personalized and, thus, standardized stimuli are impossible to generate. Nevertheless, this might be one of the biggest threats to external validity (Appel et al., 2016): Idealized pictures of a close friend might be especially problematic due to increased social comparison processes that are triggered by similarity.

In addition, while in accordance with previous studies in this line of research (Tiggemann et al., 2013; Tiggemann & Zinoviev, 2019; Veldhuis et al., 2018), the sample size was not sufficient to detect small effect sizes. Thus, a replication using a larger sample might be warranted.

Lastly, we have identified limitations in our employed measurement. Based on existing literature and main assumption behind disclaimer research (Tiggemann & Brown, 2018; Tiggemann et al., 2013, 2019) we have used perceived realism as the relevant outcome variable (Tiggemann et al., 2013) that might serve as a mediator for body satisfaction effects. However, whether or not the assumption that something needs to be realistic in order to shape our ideals and self-perception is not definite. As an additional limitation, we chose a single measurement for body satisfaction as we wanted to ensure a comprehensive measure for our age group. While this might limit the possibility to gain insight into satisfaction for specific body regions, existing research on satisfaction scales has proven that single-item measures do not produce significant different correlations and are more valid with more differentiated scales (e.g., Cheung & Lucas, 2014).

Conclusion

In summary, our findings indicate that TT are already familiar with image alteration measures, but cannot reflect on the consequences of these actions. The enhancement of images seems to have been internalized as such a natural component of the social media logic that it is no longer questioned how this relates to reality and whether such ideals are attainable. Social media platforms, like Instagram, probably add to this development by the fact that an image cannot be uploaded without different filter options appearing automatically and suggesting that image enhancement is necessary or at least "normal."

Our results further suggest that disclaimers on idealized, enhanced images are ineffective even in a young target group, presumably because digital alterations of images have already been accepted as standard, which is also the impression we got from the school workshops. The fact that one's pictures can be easily edited means that one can idealize his or her appearance at least in virtual space (e.g., Dumas et al., 2017). It goes without saying that virtual images created in this way cannot withstand reality, and this may be reflected in part in the increasing trend toward body dissatisfaction and eating disorders among adolescents. Nevertheless, it would not be effective to demonize social media or even prohibit its use. Rather, it seems urgent to find a constructive way of developing media literacy measures that go beyond the intuitive and ineffective method of disclaimers.

Notes

1. The study was part of a larger research project. Only variables and concepts relevant to the proposed hypotheses were presented in this paper.
2. The study adhered to the ethical considerations of the polling institute. In addition, the written consent of parents and children was collected.
3. All employed measures were based on existing concepts; however, they were in part modified or shortened to appropriately fit the age range of our sample.

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