Original article

Weight Information Labels on Media Models Reduce Body Dissatisfaction in Adolescent Girls

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A B S T R A C T

Purpose: To examine how weight information labels on variously sized media models affect (pre)adolescent girls' body perceptions and how they compare themselves with media models.
Methods: We used a three (body shape: extremely thin vs. thin vs. normal weight) × three (information label: 6-kg underweight vs. 3-kg underweight vs. normal weight) experimental design in three age-groups (9–10 years, 12–13 years, and 15–16 years; n = 184). The girls completed questionnaires after exposure to media models.
Results: Weight information labels affected girls' body dissatisfaction, social comparison with media figures, and objectified body consciousness. Respondents exposed to an extremely thin body shape labeled to be of "normal weight" were most dissatisfied with their own bodies and showed highest levels of objectified body consciousness and comparison with media figures. An extremely thin body shape combined with a corresponding label (i.e., 6-kg underweight), however, induced less body dissatisfaction and less comparison with the media model. Age differences were also found to affect body perceptions: adolescent girls showed more negative body perceptions than preadolescents.
Conclusions: Weight information labels may counteract the generally media-induced thin-body ideal. That is, when the weight labels appropriately informed the respondents about the actual thinness of the media model's body shape, girls were less affected. Weight information labels also instigated a normalization effect when a "normal-weight" label was attached to underweight-sized media models. Presenting underweight as a normal body shape, clearly increased body dissatisfaction in girls. Results also suggest age between preadolescence and adolescence as a critical criterion in responding to media models' body shape.

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Today's media portrayal of the thin-body ideal is pervasive [1], while overweight and obesity rapidly increase in contemporary society. Slender media figures are presented as a prerequisite for beauty and success [2]. Media images of women are thinner now than they were in the past [3], and than the actual female population [4]. Such facts seem problematic, as media serve as an important source of esthetic standards, especially among females [1]. Although most literature describes the negative effects of exposure to thin-ideal standards, to our knowledge no study has investigated how to redirect them. Our aim is to examine how to alter such standards. In the following paragraphs, the key theoretical constructs and research findings underlying our hypotheses are introduced.

In line with social cognitive [5] and cultivation [6] theory, media-exposed females may believe that their bodies ought to look like the thin ideal of media's attractive role models. Yet, most represent unattainable body shapes and appear extremely thin. Furthermore, photos are often modified by graphic software [7].

Research has shown that exposure to thin-ideal media models increases body dissatisfaction regardless of format (television, magazines, and music videos) [8,9]. Although other risk factors contribute to negative body perceptions [10], media's thin ideal has negative effects on self-evaluation [11–13], instigating weight concerns, body dissatisfaction [14,15], and efforts to look like media models [16] by adopting measures like unhealthy eating and cosmetic surgery [17].

Repeated exposure to beauty ideals may lead viewers to accept them as representations of reality through social comparison mechanisms [12,18]. Likewise, women internalize standards set by the media and tend to see their bodies from a third person's perspective, focusing on body appearance and shape instead of competences and capabilities [19]. Such "objectified body consciousness" entails body surveillance (a constant awareness of one's own body) and body shame (negative emotions evoked by one's body not holding to the internalized ideal) [19,20].

Here we propose that information labels may help to counteract the detrimental effects of media exposure on adolescent girls' weight concerns. Related research has shown that (1) exposure to slender media images with exercise- and diet-related texts reduced eating among women, compared with images without or with irrelevant text [21]; and (2) adding text labels to nutritional products influenced food and beverage intake. Information labels on fat content, for example, decreased the consumption of full-fat products [22], and labeling portion size stimulated selecting smaller-sized soft drinks [23]. So far, no studies have included simple weight information labels on body shapes. We assume that informative texts about the weight status of media models will influence viewers when comparing their bodies to the media images, thus influencing body consciousness and dissatisfaction.

We systematically combined media models varying in body shapes with informative weight labels. More specifically, we used "extremely thin" and "thin" media models because they are most common in today's media. Furthermore, we assumed that adding a *normative* weight label ("this woman has a normal weight") would emphasize the usually implicit claim of the media's thin ideal as a social "standard." A label that sets a standard of what should be considered "normal" probably exerts different reactions: girls who perceive a discrepancy between the "normal-weight" label and the model's (extremely) thin body shape will be less at ease than those exposed to a label that confirms a normal model to be of normal shape. Thus, our *normalization* hypothesis (H1) predicts that a "normal-weight" label attached to an extremely thin and thin media model increases body dissatisfaction, objectified body consciousness, and social comparison compared with a normally shaped model with a "normal-weight" label.

Conversely, we assume that the *informative* weight labels counteract the negative effects of the thin ideal when the weight labels appropriately inform the girls about the actual (underweight) size of the (extremely) thin media models. Thus, our *counteracting* hypothesis (H2) predicts that an "underweight" label informing media users about a model's (extremely) thin body status reduces body dissatisfaction, objectified body consciousness, and social comparison in adolescent girls compared with an extremely thin and thin body shape with a mismatching "normal-weight" label (Table 1).

Because of upward social comparison and body dissatisfaction, girls are motivated to change their bodies [24,25]. More

Table 1
Experimental design

	Body shape media model		
	Extremely thin	Thin	Normal
Weight information label			
6-kg underweight	Counteracting	Counteracting	N/A
3-kg underweight	Counteracting	Counteracting	N/A
Normal weight	Normalization	Normalization	Normalization

N/A indicates a condition not relevant for testing our normalization and counteracting hypotheses. However, these conditions were included for a fully balanced design.

specifically, research has shown that body dissatisfaction counts as a risk factor for restricted dieting and voluntary body changes such as plastic surgery [26,27]. We explored the extent to which the presumed underlying mechanisms (social comparison, objectified body consciousness, and body dissatisfaction) contribute to the variance in the intent to change one's body.

The pervasive thin-body ideal affects girls at a young age [28]. Research has shown that even 9-year-olds associated being overweight with impaired social functioning and failure to succeed [29]. Furthermore, preadolescent girls (8–10 years) expressed weight concerns [30], and 9-year-old girls in *all* weight categories wanted to be thinner than they were [31]. Various studies have confirmed the young age of body dissatisfaction, which increases with age and peaks at adolescence [32–34]. It seems that (pre)adolescent girls respond to body dissatisfaction the same way as older age groups, resulting in unhealthy eating behavior [25].

Age varied widely in previous studies, and we thus systematically studied girls in three age-groups. Based on the relevant literature, we expect the youngest cohort to experience the lowest levels of (a) body dissatisfaction, (b) objectified body consciousness, and (c) social comparison; we expect the oldest cohort to experience the highest (H3).

Methods

Participants and design

Participants were 184 (pre)adolescent girls (M_{age} = 12.6, standard deviation$_{age}$ [SD] = 2.53, range = 9–16 years), randomly selected from three common primary and secondary schools. A three (body shape: extremely thin vs. thin vs. normal) × three (information label: 6-kg underweight vs. 3-kg underweight vs. normal) factorial between-subjects design tested hypotheses in three age-groups: 9–10 (n = 63) versus 12–13 (n = 58) versus 15–16 (n = 63). Paper-and-pencil questionnaires each included one of nine experimental "body shape by information label" conditions, printed in full color and page-width. Participants were randomly assigned to experimental conditions. We received 99% participant consent, including school authorities, teachers, and parents/caretakers. Our study was approved by the Institutional Review Board of our institution.

Materials

We selected three media models in bikinis after pretesting 32 pictures from various magazines. A separate sample of (pre)adolescent girls (n = 20; aged 10–16 years) perceived the three

models as equally attractive but significantly different in weight (In the pretest, *perceived thinness* and *beauty* were measured on 10-point scales [1 = "extremely thin"/"very ugly"; and 10 = "extremely big"/"very beautiful"]. Results showed different perceived thinness and comparable beauty for the three media models that we selected to be used for our three body shape conditions: (1) extremely thin body shape [$M_{thinness}$ = 1.81, $SD_{thinness}$ = .91; M_{beauty} = 7.44, SD_{beauty} = 2.31], (2) thin body shape [$M_{thinness}$ = 3.81, $SD_{thinness}$ = 1.11; M_{beauty} = 7.31, SD_{beauty} = 1.78], and (3) normal body shape [$M_{thinness}$ = 5.13, $SD_{thinness}$ = 1.41; M_{beauty} = 8.50, SD_{beauty} = 1.27]. Note that we assessed the body shapes as seen from the adolescent girls' point of view.), leading to the (1) extremely thin, (2) thin, and (3) normal body shape conditions.

Weight information labels were as follows: "This woman is 6 kilo underweight," "This woman is 3 kilo underweight," and "This woman has a normal weight." Using graphic software, the labels were pasted in as if they were an original part of the magazine-like pictures.

Measures

All measurements described in the following text included Likert-type items followed by five-point rating scales from one (totally disagree) to five (totally agree).

Body dissatisfaction (Cronbach α = .90) was measured by the original nine-item Body Dissatisfaction Subscale from the Eating Disorder Inventory [35] and expanded by two items to more equally address the various body parts. Sample items were as follows: "I think my belly is too fat," and "I am happy with how I look." After recoding, higher scores indicated more body *dissat*isfaction. One item was discarded because of a bad fit (i.e., "I think my belly is just right").

Objectified body consciousness (Cronbach α = .81) was based on the Objectified Body Consciousness Scale (for youth) [20,36], measuring both body surveillance and body shame, each sub-scale consisting of five items (including contraindicative items). Sample items for *body surveillance* and *body shame* were "I often worry about how I look" and "I would be embarrassed for people to know how much I weigh," respectively. Based on reliability analyses, we removed two items.

Social comparison with media figures (Cronbach α = .88) was measured with seven items from The Internalization Scale of the Sociocultural Attitudes Toward Appearance Questionnaire [37]. A sample item was "I often compare myself to the models in magazines."

Intention to change one's body (Cronbach α = .70) was measured with seven items (two contraindicative) based on the Acceptance of Cosmetic Surgery Scale [38]. A sample item was "In the future, I might consider plastic surgery."

Results

Manipulation checks

Manipulation checks confirmed that the body shapes and information labels were successfully chosen. A between-subjects analysis of variance (ANOVA) revealed a significant effect for body shape on perceived thinness ($F[2,181]$ = 29.22, $p <$ .0001, ηp_2 = .24). Post hoc tests showed that an extremely thin body shape was rated significantly thinner (M = 3.07, SD = 1.77) than a thin body shape (M = 4.18, SD = 1.37, $p <$ .0001) and a normal body shape (M = 5.05, SD = 1.10, $p <$ .0001). The perceived

thinness also differed significantly between a thin and a normal body shape (p = .002). Importantly, no significant difference in perceived attractiveness of the various body shapes was found ($F[2,181]$ = 2.06, p = .13, ηp_2 = .02).

A between-subjects ANOVA showed a significant effect of the information labels on perceived thinness ($F[2,181]$ = 7.62, p = .001, ηp_2 = .08). As expected, post hoc analysis indicated that a 6-kg-underweight label induced a significantly lower perceived thinness (M = 3.77, SD = 1.54) than a normal-weight label (M = 4.80, SD = 1.61, p = .001). Similarly, a 3-kg-underweight label (M = 3.90, SD = 1.58) induced less perceived thinness than a normal-weight label (p = .007). Although the means were in the predicted direction, the post hoc test showed no significant difference between the 6-kg- and 3-kg-underweight conditions. As expected, the between-subjects test revealed no significant main effect of weight label on perceived attractiveness ($F[2,181]$ = 2.35, p = .10, ηp_2 = .03), nor did the post hoc analysis show significant differences in perceived attractiveness between the information label conditions.

Testing hypotheses

To test our hypotheses, a three (body shape: extremely thin vs. thin vs. normal) × three (information label: 6-kg-under-weight vs. 3-kg-underweight vs. normal weight) × three (age groups: 9–10 vs. 12–13 vs. 15–16 years) between-subjects mul-tivariate ANOVA was performed with three dependent variables: body dissatisfaction, objectified body consciousness, and social comparison.

Results showed main effects for body shape (Wilks λ = .921, $F[6,310]$ = 2.18, p = .04, ηp^2 = .04) and age-group (Wilks λ = .795, $F[6,310]$ = 6.27, $p <$ .0001, ηp^2 = .11), but no significant main effect for information labels (p = .77). Main effects, how-ever, were qualified by significant two-way interaction effects: between body shape and information label (Wilks λ = .836, $F[12,410.38]$ = 2.39, p = .005, ηp^2 = .06), and between body shape and age-group (Wilks' λ = .847, $F[12,410.38]$ = 2.22, p = .01, ηp^2 = .05). A significant multivariate three-way interaction between information label, body shape, and age-group (Wilks λ = .674, $F[24,450.15]$ = 2.74, $p <$ .0001, ηp^2 = .12) was also found.

In testing H1 and H2, univariate F tests confirmed the signif-icant interactions of body shape and information label on each dependent variable: body dissatisfaction ($F[4,157]$ = 2.34, p = .057, ηp^2 = .06; Figure 1), objectified body consciousness ($F[4,157]$ = 2.45 = 2.45, p = .05, ηp^2 = .06; Figure 2), and social comparison ($F[4,157]$ = 2.73, p = .03, ηp^2 = .07; Figure 3). Effects of the various body shapes were influenced by the specific weight information labels, generally supporting our assump-tions. To test our normalization and counteracting hypotheses more specifically, simple effect analyses (cf. [39]) and pairwise comparisons were needed.

Testing the normalization hypothesis

Simple effect analysis comparing the different body shapes within each weight label condition tested our normalization hypothesis (H1), assuming that the normal-weight label sorted different effects throughout the body shapes. Findings confirmed that it did exert significantly different levels of body dissatisfac-tion ($F[2,157]$ = 8.16, $p <$ .0001) and objectified body conscious-
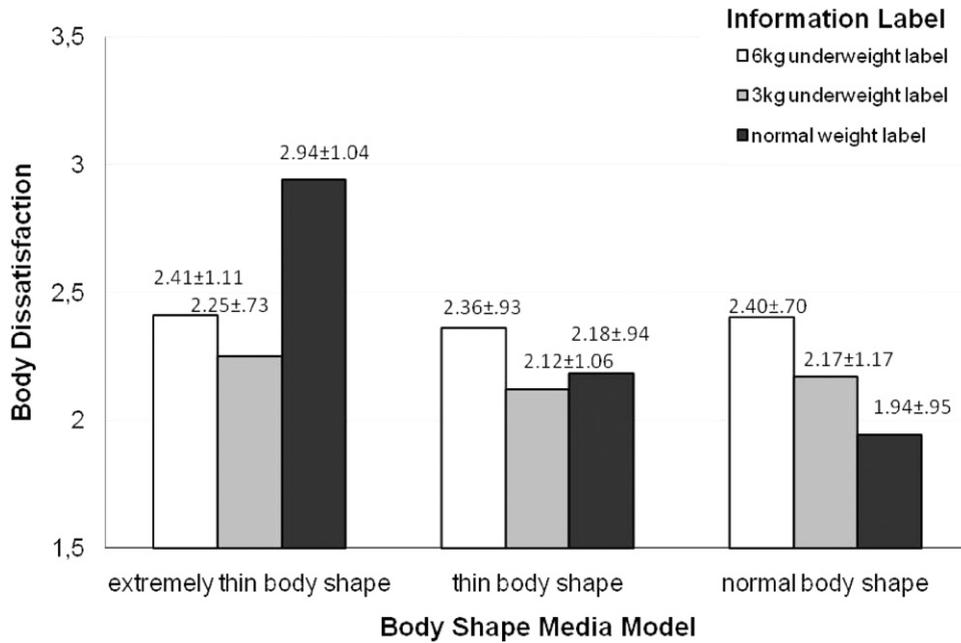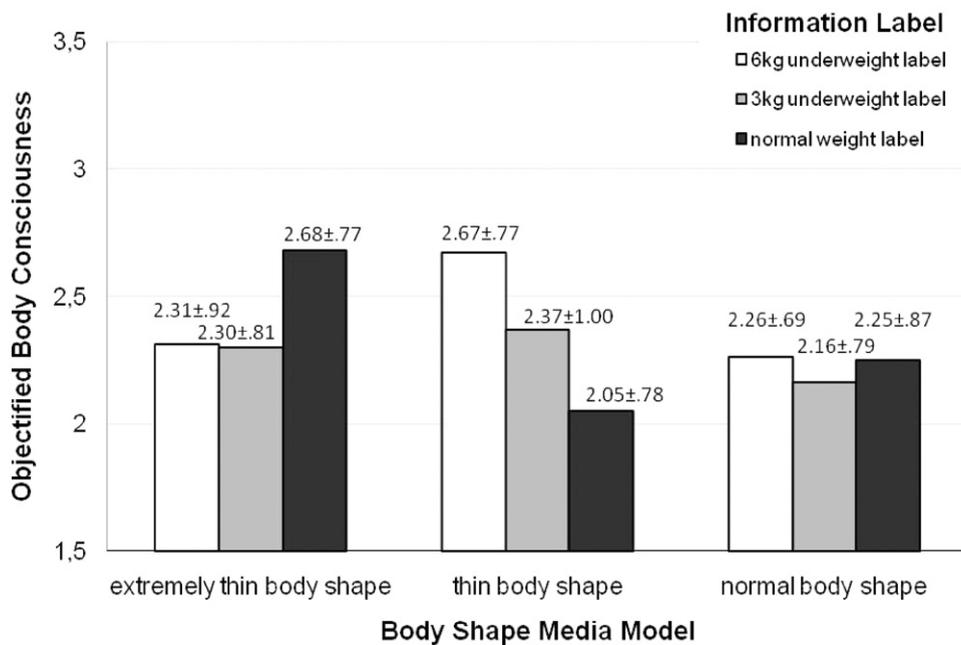
Figure 1. Interaction between body shape and weight label on body dissatisfaction. The numbers in the figure indicate the means ± standard deviations of body dissatisfaction per body shape by weight label condition.

ness ($F[2,157] = 4.08$, $p = .02$) between the body shape conditions, but neither of the underweight labels showed significant effects. Pairwise comparisons showed that respondents who saw an extremely thin body shape combined with a normal-weight label experienced significantly more body dissatisfaction and objectified body consciousness than respondents who saw the thin ($p = .003$ and $p = .005$, respectively) or normal body shape ($p < .0001$ and $p = .08$, respectively) combined with the normal-weight label.

Similar patterns were found for social comparison showing a marginally significant effect of the normal-weight label ($F[2,157] = 2.40$, $p = .09$) throughout the body shape conditions. Pairwise com-

Figure 2. Interaction between body shape and weight label on objectified body consciousness. The numbers in the figure indicate the means ± standard deviations of objectified body consciousness per body shape by weight label condition.
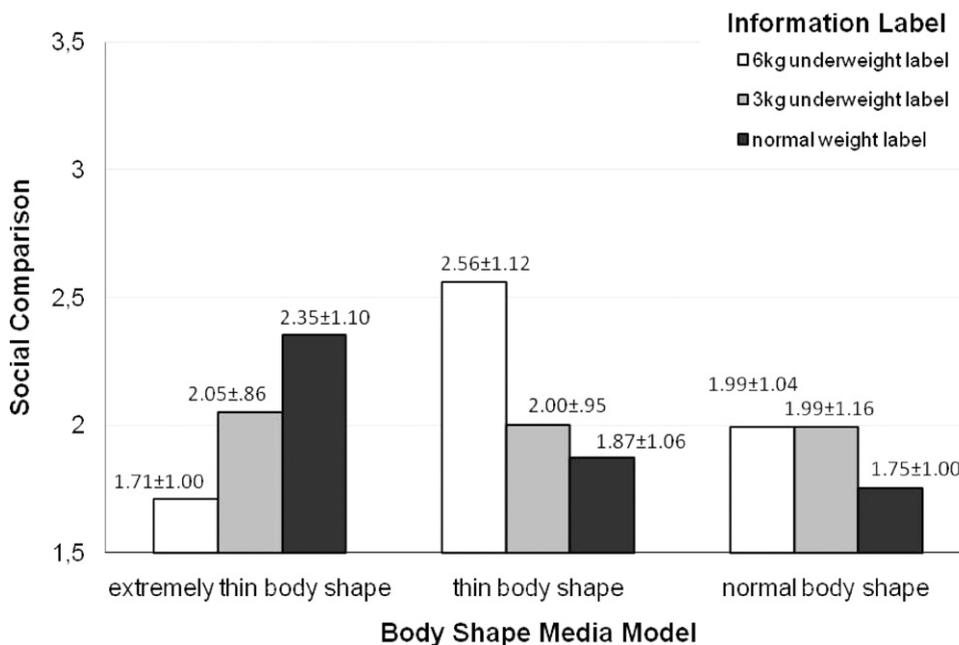
Figure 3. Interaction between body shape and weight label on social comparison. The numbers in the figure indicate the means ± standard deviations of social comparison per body shape by weight label condition.

parisons specified that when exposed to an extremely thin body shape condition, a normal-weight label induced higher levels of social comparison with media models than either a thin ($p = .08$) or a normal body shape ($p = .04$) with normal-weight labels attached. Overall, results support our normalization hypothesis (H1).

Testing the counteracting hypothesis

Simple effect analysis compared the different weight label conditions within each body shape condition to test our counteracting hypothesis (H2), assuming that an underweight label on an (extremely) thin model induces less negative reactions than a normal-weight label on the same model. For body dissatisfaction, findings showed that the weight label conditions differed significantly only with the extremely thin body shape ($F[2,157] = 3.59$, $p = .03$). Pairwise comparisons revealed that the extremely thin media model combined with a 6-kg- or a 3-kg-underweight label induced less body dissatisfaction than an extremely thin media model with a normal-weight label ($p = .09$ and $p = .009$, respectively). Although no significant contrast effect was found for social comparison in the extremely thin body condition, additional pairwise comparisons showed that a 6-kg-underweight label on an extremely thin body shape induced less social comparison than the normal-weight label ($p = .04$).

For both objectified body consciousness and social comparison, results revealed that weight labels exerted significantly different reactions only in the thin body shape condition ($F[2,157] = 3.90$, $p = .02$, and $F[2,157] = 3.18$, $p = .04$, respectively). Pairwise comparisons further showed that a thin media model with a 6-kg-underweight label induced significantly more objectified body consciousness ($p = .006$) and social comparison ($p = .03$) than the thin body shape with a normal-weight label. Additionally, a thin model with a 6-kg-underweight label induced significantly more social comparison than a thin model with a 3-kg-

underweight label ($p = .04$). These results partially support our counteracting hypothesis (H2).

Testing differences between age groups

In testing H3, univariate *F* tests confirmed the multivariate significant main effect of age-group on the dependent variables body dissatisfaction ($F[2,157] = 15.55$, $p < .0001$, $\eta p^2 = .17$), objectified body consciousness ($F[2,157] = 5.19$, $p = .007$, $\eta p^2 = .06$), and social comparison ($F[2,157] = 3.43$, $p = .035$, $\eta p^2 = .04$; Table 2).

Post hoc analyses indicated that the two older age-groups showed significantly more body dissatisfaction than girls aged 9–10 years (both *p's* < .0001), but with no significant difference *between* the older age groups. Comparable patterns were found for objectified body consciousness: girls aged 12–13 experienced significantly more objectified body consciousness ($p = .008$) and 15–16-year-olds showed marginally significant higher levels ($p = .059$) than the preadolescent girls. Again, no significant difference in objectified body consciousness between the older age groups was found.

The 15–16-year-olds also showed higher levels of social comparison than the preadolescent girls ($p = .018$). However, neither

Table 2
Means and standard deviations of body dissatisfaction, objectified body consciousness, and social comparison per age-group and totals

Age-groups	Body dissatisfaction		Objectified body consciousness		Social comparison	
	M	*SD*	*M*	*SD*	*M*	*SD*
9–10 years	1.83	.72	2.08	.76	1.77	.70
12–13 years	2.46	1.07	2.51	.73	2.08	1.15
15–16 years	2.63	.92	2.41	.92	2.26	1.18
Total	2.30	.97	2.34	.83	2.03	1.04

the 9–10- and 12–13-year-olds nor the 12–13- and 15–16-year-olds differ in this respect, thus supporting H3.

Predictors for intention to change one's body

To analyze the mechanisms that contribute to the intention to change one's body, we performed hierarchical regression analyses. Results showed that body dissatisfaction contributed significantly ($p < .0001$; $\beta = .51$), explaining 27% of the variance in a first step. Adding social comparison resulted in another 9% of explained variance ($p < .0001$; $\beta = .40$), while body dissatisfaction remained a significant predictor ($p = .001$; $\beta = .25$). Finally, after including objectified body consciousness in the regression model, social comparison was the strongest predictor ($p < .0001$; $\beta = .32$), followed by body dissatisfaction ($p = .015$; $\beta = .20$), while objectified body consciousness appeared marginally significant ($p = .066$; $\beta = .16$). Together, body dissatisfaction, social comparison, and objectified body consciousness accounted for 37% of the variance in intention to change one's body, the most important being social comparison.

Discussion

The aim of our study was to test whether weight information labels could challenge the biasing effects of Western media's thin-body ideal. Results generally supported our hypotheses predicting normalizing and counteracting effects of information labels on teen girls' perceptions of media models' body shapes and subsequent processes of comparing and perceiving their own bodies. Furthermore, adolescent girls were more negative about their body perceptions and body comparisons with media figures than preadolescent girls. Finally, comparison with media models contributed most strongly to girls' intentions to change their bodies.

The findings support our *normalization hypothesis*, indicating that a normal-weight label has a normalizing effect on what is considered "normal," even when the visualized body shape is unrealistically and unhealthily thin. Respondents exposed to an extremely thin body shape labeled as normal were most dissatisfied with their own bodies and showed the highest levels of objectified body consciousness and social comparison with media models. Here the label seemed to enlarge the discrepancy between the perceived self and perceived ideal-body shape; that is, it increased the discrepancy between what the girls saw (an *extremely* thin body image) and what they read ("normal weight"). The discrepancy, in turn, increased body dissatisfaction, objectified body consciousness, and social comparison, which corresponds to the literature showing that a discrepancy leads to a negative mood and self-evaluation [20]. Conversely, a *normal* body appearance accompanied by text claiming the body is indeed of *normal* weight evoked the lowest levels of social comparison and body dissatisfaction. The image/label combination confirmed a normal, realistic body representation, evoking less discrepancy between one's own body and the ideal body.

The *counteracting hypothesis* was supported for body dissatisfaction and social comparison for girls exposed to the extremely thin model. That is, appropriate weight information labels *counteracted* the media's thin-body ideal. Although exposed to an extremely thin media model, informative texts about the (extreme) low weight of the model induced less body dissatisfaction and comparison to the model (compared with the same model with a normal-weight label). Thus, an information label that appropriately confirms a model's extremely thin appearance

positively affects adolescents' psychosocial responses and aligns with previous results regarding positive effects of simple information on diet and exercise accompanying thin models [21] and fat percentages of food [22]. We successfully added pragmatic weight information labels to directly address the discrepancy between what girls saw and what they read.

Unexpectedly, a thin body image combined with a 6-kg-underweight label evoked stronger social comparison and objectified body consciousness than the same model labeled "normal weight." A possible explanation might be that the girls perceived the model as rather normal because it is what they most often see in the media. If so, the 6-kg-underweight label might have alarmed them by increasing their awareness of what they (implicitly) consider an acceptable body shape, unpleasantly triggering social comparison processes and objectified body consciousness. Future research should explore what body shapes girls consider acceptable, normal, and ideal.

Concordant with previous research [24,25], both upward social comparison with media figures and body dissatisfaction significantly predicted the girls' intention to change their bodies with strategies like dieting and plastic surgery. Objectified body consciousness, however, contributed a relatively small portion to the variance in such an intention. Upward social comparison with media figures most strongly predicted willingness to change one's body.

Our study has implications for preventing unrealistic body images and unhealthy dieting practices. Although some currently available media literacy interventions are successful, most seem to be time-consuming programs that reach relatively small groups (e.g., [40]). Information labels implemented in mass media may have the ability to overcome these restrictions: mass media are ubiquitous and reach a large portion of the target group. Furthermore, using existing venues is less expensive than creating new ones.

Exposure to accurate labels on media models' body shapes may increase awareness that many are underweight, which may lower perceived realism of extremely thin and thin bodies and increase critical thinking about what is a normal and healthy body shape. Our study adds to the debate on mandatory logos warning the public about graphically edited photos of media models. Such labels may increase awareness that the presentations are often artificial.

Our study supports previous findings that girls' body dissatisfaction grows with age and peaks at adolescence [32,34]. Our 15–16-year-old group reported more body dissatisfaction, objectified body consciousness, and social comparison than their younger counterparts. Importantly, the middle age-group showed significantly more objectified body consciousness and body dissatisfaction than preadolescent girls, resembling the 15–16-year-olds. Contrary to our expectations, 12–13-year-old girls did not differ significantly from the older group on the three dependent variables. A critical age where negative body perceptions steadily increase thus seems to exist between preadolescence and adolescence. Timely targeting of specific age-groups increases the likelihood of resisting harmful media influences later on in adolescent life.

Limitations and future research

Given the complexity of our design, we did not include a control group without information labels and used only a posttest design. Future research should include baseline measures and control

groups to more precisely assess the effects of information labels. Adding a no-label condition would clarify whether accurate weight labels on very thin models diminish negative effects, or whether inaccurate normalizing labels strengthen negative effects.

Although we stratified for age-groups, we could not draw more specific conclusions by age-group because of the small sample size. The relevant differences found between the three age-groups, however, indicate that future research on media figures and information labels should focus on the 12–16-year-old age-group, who seem most reactive to the impact of media models' looks. Alternatively, including baseline measures allows us to distinguish whether older girls have more negative trait levels of body perceptions than younger girls, or whether they react more strongly to the stimulus.

This is a first study establishing normalization and counter-acting effects of information labels. Replications are needed using various media models and different information labels, for example, combining body images with more informative texts regarding healthy lifestyles instead of one line weight labels.

Conclusions

Our study provides new insights into the underlying dynamics of exposure to Western media's thin-body ideal in girls, and how simple weight information labels may do a good job in reducing body dissatisfaction and intentions to alter one's body with measures like plastic surgery. Informing girls about the actual weight status of extremely thin models may counteract detrimental effects. Likewise, a normalization effect occurred from (mis)informing girls about a "normal" body shape in line with today's extremely thin body shapes in the media. By counteracting media's thin-body ideal and standardizing a normal body image through simple, appropriate information about models' weight status, girls were less upset.

Acknowledgments

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