

Childhood obesity stigma: Association with television, videogame, and magazine exposure

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Abstract

Although the stigmatization of obesity among children is highly prevalent, its origins and relationship to mass media exposure are largely unknown. Ninety boys and 171 girls aged 10–13 years (mean BMI = 19.84) were asked to rank, in order of liking, 12 figures of peers depicted both with and without various disabilities or obesity, and to rate their attitudes towards the obese child on visual analogue scales. Weekly time spent watching television, watching videogames, and reading magazines on weekdays and weekends was assessed. Total media use, magazine use, and videogame use were significantly correlated with more negative reactions to obese girls and boys. Regression analyses revealed that greater dislike of obese children relative to their non-overweight peers was uniquely predicted by magazine reading time. Thus, media exposure was associated with stigmatizing attitudes towards obese children. Mass media sources may lead children to devalue and stigmatize peers with above-average body weights.

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Introduction

The stigmatization of obesity in children is highly prevalent. Peers, teachers, and family members have been reported to hold biased attitudes towards overweight youth, including greater dislike, attribution of negative stereotypes, and discriminatory treatment (Latner & Schwartz, 2005; Neumark-Sztainer & Eisenberg, 2005). This widespread bias can have devastating consequences. Examples of such consequences include interpersonal difficulties (Strauss & Pollack, 2003), bullying (Janssen, Craig, Boyce, & Pickett, 2004), relational victimization (Pearce, Boergers, & Prinstein, 2002), psychological problems (Eisenberg, Neumark-Sztainer, & Story, 2003),

binge eating (Neumark-Sztainer et al., 2002), poor body image (Thompson, Coover, Richards, Johnson, & Cattarin, 1995), and academic and socioeconomic problems (Canning & Mayer, 1966; Gortmaker, Must, Perrin, Sobol, & Dietz, 1993). Given the rapidly increasing rates of childhood obesity in Western society (Wang & Lobstein, 2006), weight bias has the potential to negatively affect greater numbers of children than ever before.

The origins of weight bias are not well established, but it is likely that multiple sources contribute to the development of this stigma. Children may be influenced by their parents, who may role-model biased beliefs. For example, when asked to create and tell stories to their children about pictures of different children, parents included more stereotypical and negative descriptions of obese children than of average-weight or disabled children (Adams, Hicken, & Salehi, 1988). Daughters whose interactions with their parents focused

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more on body shape and weight loss were more likely to endorse fat stereotypes (Davison & Birch, 2004). Other sources of weight bias that may influence children include educators, as limited evidence suggests that they contribute to bias against overweight children. For example, physical education students displayed particularly high levels of weight bias as measured on implicit association tests, and these biased attitudes increased as the students progressed further in their professional training (O'Brien, Hunter, & Banks, 2007). More than one in five school teachers, nurses, and social workers reported believing that obese persons are more emotional, less tidy, less likely to succeed at work, have different personalities and more family problems, and are to blame for their weight (Neumark-Sztainer, Story, & Harris, 1999).

It is also likely that weight bias is modeled and transmitted through the popular media. Due to the pervasive nature of television and magazines, the mass media are among the strongest communicators of the idealized thin body (Stice, Schupak-Neuberg, Shaw, & Stein, 1994; Thompson & Heinberg, 1999). The “thin body” ideal can be transmitted through encouragement to diet and the exaltation of ultra thin models (Thompson & Stice, 2001). Because the ideal is unattainable for most, the pressure to be thin engenders body dissatisfaction. Exposure to media content promoting ideal weight, shape, and appearance is associated with body dissatisfaction and increased risk of eating pathology (Cusumano & Thompson, 2001; Harrison & Cantor, 1997; Levine & Smolak, 1996; Paxton, Schutz, Wertheim, & Muir, 1999; Stice & Bearman, 2001). For example, Stice and Shaw (1994) found that after a 3-min exposure to ultra-thin models from a women's magazine, participants had higher levels of depression, stress, guilt, body image dissatisfaction, and insecurity than after exposure to average-sized models. In turn, high levels of body dissatisfaction increase the risk for disturbed eating behaviors, such as excessive dieting or purging, in order to attain the thin ideal (Stice et al., 1994). Research has demonstrated the relationship between television exposure and eating pathology in children as young as age 11 (Harrison, 2000).

In the popular media, thinness is portrayed as leading to social rewards such as success and happiness (Harrison, 2000), while being overweight is depicted as leading to undesirable consequences. Evidence that the mass media presents obese individuals in a biased manner comes from an innovative study by Greenberg, Eastin, Hofschire, Lachlan, and Brownell (2003), who analyzed characters in 60 popular television (TV)

shows. Obese people were underrepresented –3% of women and 7% of men on TV were obese compared to 25 and 20% in the general population—whereas thin people were over-represented. Heavier characters had fewer romantic interactions or positive social interactions with others. Larger males were less likely to be employed or have leadership interactions, and larger females were more likely to be objects of humor.

No such systematic review has been conducted of popular media directed at children, but several prominent examples of weight bias stand out, such as negative portrayals of obese persons in children's literature and movies such as the *Harry Potter* series and *Charlie and the Chocolate Factory* (Latner & Schwartz, 2005). An analysis of one specific type of medium directed at children, animated cartoons, has suggested that recent decades have seen an increase in thin cartoon characters and a decrease in overweight characters (Klein & Shiffman, 2005). Thin characters were more often portrayed as attractive and overweight characters as unattractive, and both thin and attractive characters were depicted as performing more prosocial acts and being more intelligent, youthful, happy, loving, and “good” overall (Klein & Shiffman, 2005, 2006).

Limited research has suggested that media exposure may be linked to weight bias. Geier, Schwartz, and Brownell (2003) found that participants who viewed before-and-after photographs in diet advertisements increased their negative beliefs about obese people and their belief in the controllability of weight, compared to participants who viewed only the before or the after photographs. In 1st–3rd grade boys, higher levels of TV viewing was associated with greater levels of stereotyping of overweight girls, as indicated by ratings of attributions such as “nice, greedy, smart, clean, tell the truth, and have a lot of friends” (Harrison, 2000, p. 626). Both girls and boys who spent more time than their peers watching TV showed increased eating disorder symptoms. Research on social consensus theory has found that people are influenced by what they perceive to be others' views about obese persons (Puhl, Schwartz, & Brownell, 2005). Therefore, children who see more presentations of weight bias, modeled by television, videogames, or magazines, might be more likely to become biased themselves.

Further research is needed to examine the possible link between different forms of mass media exposure and the development of weight bias in children. The present study tested the hypothesis that obesity stigma is associated with increased levels of media exposure. Three types of media use were investigated, TV viewing, videogame (VG) playing, and magazine

reading, in order to assess the popular types of media used by both boys and girls. In addition, this study also aimed to identify the specific types of media that are associated with overweight and to replicate previous findings that media exposure, particularly TV and VG use, is associated with increased risk of overweight in children (Vandewater, Shim, & Caplovitz, 2004; Wake, Hesketh, & Waters, 2003).

Method

Participants

Participants included 90 boys and 171 girls between the ages of 10 and 13 who were recruited from seven primary schools in Christchurch, New Zealand. Their mean age (*SD*) was 11.30 (.75) years. The sample was 77.0% New Zealand European or other Caucasian, 11.5% Asian or part Asian, 7.7% Maori or part Maori, .8% African and .8% Pacific Islander or part Pacific Islander. An additional 2.2% of children did not indicate their ethnic background. Their mean body mass index (BMI; kg/m²) was 19.84 (3.55; range = 14.53–32.05). Classified according to the Center for Disease Control BMI-for-age growth charts (<http://www.cdc.gov/growthcharts>), none of the participants were underweight (<5th percentile), 70.3% were in the normal weight range (5th percentile to <85th percentile), 18.1% were at risk for overweight (85th to <95th percentile), and 11.6% were overweight (95th percentile or greater). One participating school was a private girls' school, and the other six were public coeducational schools from a range of different suburbs.

Procedure

The participants in this study were obtained by contacting primary schools. Letters outlining the nature of the study were distributed to schools around Christchurch requesting participation in the study. Data were collected during the school term. Once a school had agreed to participate, information and informed consent forms were distributed to the student's parents/caregivers and students were required to hand these forms into their teacher. The participants were given an information sheet and assent form to sign before testing commenced. To ensure that the participants were aware of the task they had to complete, the experimenter read the instructions aloud. The participants were instructed to answer the questionnaires honestly and told that there were no right or wrong answers to the questions. The students were asked not to share their answers with

others and to work on their own. Finally, the participants were ensured confidentiality. The participants' heights and weights (on a digital scale) were measured after they completed the questionnaires, and they were thanked for their participation and debriefed.

Measures

The questionnaire comprised three parts. First, children were shown pictures of six children of each sex and asked to circle the one in each set that they liked the best. The figures were 60 mm high and were designed to depict children of approximately 10–11 years of age. Each set included a non-overweight, non-disabled child, a non-disabled overweight child, a child on crutches, a child in a wheelchair, a child with a missing left hand, and a child with a facial disfigurement (a large scar on the left side of the face). The participants were next shown another set of the figures below the first set and asked to circle the one they liked second best. They were then shown a third set and asked which they liked third best, and so on, until all six rankings had been obtained. They were then requested to check their answers and make sure that they had circled each girl or boy once and only once. These figures comprised an updated and validated version of an older and widely used measure of obesity stigma (Latner, Simmonds, Rosewall, & Stunkard, *in press*; Richardson, Goodman, Hastorf, & Dornbusch, 1961). In keeping with previous research, figures were consistently presented in the order shown in Appendix A (Latner et al., *in press*). Rankings assigned to obese boy and girl figures were used as a measure of liking of obese peers relative to other peers.

In the next part of the questionnaire, participants were asked to answer several questions about the obese figure, by drawing a vertical line across a 100 mm visual analogue scale (VAS) anchored at the left and right by the words *Not at all* and *Very much*. On the left of the four questions was shown a copy of the obese figure about which they were to answer the questions. Each participant filled out these questions for both the obese girl and for the obese boy. The questions were “*How much do you like the girl [or boy] on the left?*”, “*How much would you yourself want to be like this girl [or boy]?*”, and “*How smart would you guess this girl [or boy] is?*” Higher scores indicated greater liking (lower stigma). The internal consistency (Cronbach's alpha) of these six questions, entitled the stigmatizing attitudes scale (SAS), was .82.

Third, participants were required to answer three two-part questions regarding media consumption. The

questions were: (1) “In the past week, how much time have you usually spent watching TV on each weekday (hours and minutes)? ____ and on each weekend day (hours and minutes)? ____.” (2) “In the past week, how much time have you usually spent playing video games on each weekday (hours and minutes)? ____ and on each weekend day (hours and minutes)? ____.” (3) “In the past week, how much time have you usually spent reading magazines on each weekday (hours and minutes)? ____ and on each weekend day (hours and minutes)? ____.”

Statistical analysis

In order to examine differences in patterns of media use between boys and girls, independent-sample *t*-tests were used to compare their weekly use of TV, VG, magazines, and their total exposure to all three media types combined. Correlations between media use and age and BMI were examined. Sex differences in VAS liking and rankings of male and female children were assessed by 2 (participant sex) \times 2 (target sex) ANOVA with repeated measures on the second factor. To examine obesity stigma in relation to another specific physical stigma, facial disfigurement (FD), Wilcoxon signed ranks test was used to compare rankings of overweight figures with FD figures. Correlations between media use and obesity stigma were calculated using the following measures of stigma: VAS responses on liking of overweight girls and overweight boys, overall SAS scores, and relative liking of overweight girls and boys as compared to non-overweight girls and boys. In addition, relative liking of children with FD was also correlated with TV, VG, and magazine use. To examine the relative contribution of different types of media exposure to the variance in obesity stigma, the amount of time spent on TV, VG, and magazines were entered into a multiple linear regression analyses to predict participants' obesity stigma using the measures described above, VAS liking, SAS scores, and relative liking.

Results

Sex, ethnicity, and age differences

Boys spent significantly more time playing VG than girls, while girls spent significantly more time reading magazines than boys, as shown in Table 1. No differences emerged for TV use. In the overall time spent on all three media types, boys exceeded girls. There were no differences in total media use or specific types of media use across ethnic groups, as demon-

Table 1

Means (SD) of weekly minutes of television watching, videogame playing, and magazine reading among girls and boys

Media consumption	Girls (SD)	Boys (SD)	<i>t</i> -Value
Television watching	230.86 (183.87)	227.96 (214.36)	.10
Videogame playing	29.39 (65.46)	152.89 (158.57)	−8.22**
Magazine reading	68.26 (103.96)	41.35 (76.36)	1.99*
Weekday media-total	135.02 (102.99)	164.01 (137.04)	−1.75
Weekend media-total	197.82 (165.31)	261.32 (218.77)	−2.38*
Total media time	329.16 (244.07)	423.38 (328.96)	−2.37*

* $p < .05$, ** $p < .001$.

strated by one-way ANOVAs using media exposure types as dependent variables. However, there was a significant positive correlation between TV use and age, and between total media use and age ($r(217) = .17$, $p < .05$; $r(216) = .19$, $p < .005$), but not between age and use of any other single media type.

Two-factor ANOVA showed a main effect for participant sex on VAS liking of overweight targets ($F(1, 236) = 5.75$, $p < .05$), but this was qualified by an interaction effect between participant sex and target sex ($F(1, 236) = 22.13$, $p < .001$). Girls' and boys' responses to overweight males were similar ($M_s = 18.50, 18.76$ mm), but girls liked overweight females more than boys did ($M_s = 25.30, 13.73$ mm). No main effect for participant or figure's sex emerged for overweight figures' mean rankings; however, an interaction effect showed that girls liked overweight female figures more than boys did, whereas boys liked overweight male figures more than girls did ($F(1, 227) = 54.72$, $p < .001$; M_s shown in Table 2). Finally, both girl and boy overweight targets were ranked significantly more harshly than their FD counterparts ($Z = -10.23$, $p < .001$; $Z = -11.61$, $p < .001$).

Media and BMI

Significant Pearson product-moment correlations were found between BMI and media use, as shown in Table 3. Higher BMI was positively associated with greater total media use, TV use, and weekday videogame and magazine use. Both weekday and weekend TV viewing time were associated with BMI. Multiple regression analyses were used to examine the relative contribution of the three media types by entering weekly TV, VG, and magazine time as predictors of BMI. The analysis was significant ($F(2, 212) = 4.57$, $p < .005$, adjusted $R^2 = .05$), and the only predictor with an independently significant beta value was TV watching ($\beta = .20$, $sr^2 = .19$, $t = 2.87$, $p < .005$). To examine the relative contributions of weekday and weekend media

Table 2
Girls' and boys' mean (SD) rankings of male and female figures

Figures	Female figures		Male figures	
	Female participants	Male participants	Female participants	Male participants
Healthy	1.41 (1.12)	1.09 (.39)	1.18 (.77)	1.35 (.99)
Crutches	3.02 (1.25)	2.81 (.92)	2.79 (.96)	3.14 (1.05)
Wheelchair	3.98 (1.29)	3.98 (1.14)	4.11 (1.10)	4.11 (1.20)
Hand	4.63 (1.29)	4.61 (1.09)	4.54 (1.29)	4.81 (1.29)
Face	3.23 (1.35)	3.12 (1.36)	3.10 (1.17)	2.82 (1.37)
Obese	4.70 (1.40)	5.37 (.98)	5.28 (1.12)	4.80 (1.20)

use, total weekday and total weekend media use (of all three media types combined) were entered as predictors of BMI in a separate regression analysis. The analysis showed overall significance ($F(2, 213) = 8.88, p < .001$, adjusted $R^2 = .07$), and the one independently significant predictor was weekday media use ($\beta = .28, sr^2 = .21, t = 3.06, p < .005$). Similarly, ANOVA demonstrated that TV use and overall media use were significantly higher in overweight children than in normal weight children and those at risk for overweight ($F(2, 213) = 3.72, p < .05$; $F(2, 212) = 4.27, p < .05$).

Media exposure and stigma

As measured by SAS scores, obesity stigma was significantly associated with weekday VG playing and total media use. These correlations are shown in Table 3. As measured by preference (liking) of obese children relative to other children, more negative reactions to both obese boys and obese girls were associated with greater magazine use.¹ BMI was unrelated to any of the measures of obesity stigma; r s ranged from $-.08$ to $.06$. Because of different patterns of media use, correlations were also calculated separately for boy and girl participants. The results for both girls and boys were similar to the total sample. In addition, boys' SAS scores were also significantly correlated with their total TV viewing time ($r(71) = -.26, p < .05$).

In predicting the liking of obese girls relative to other girls, the overall regression analysis was significant ($F(2, 203) = 3.12, p < .05$, adjusted $R^2 = .03$), and magazine reading emerged as an independently significant predictor ($\beta = .19, sr^2 = .19, t = 2.71, p < .01$). Similarly, in predicting the liking of boys relative to other boys, the overall regression was significant ($F(2,$

$204) = 4.52, p < .005$, adjusted $R^2 = .05$) and magazine reading was independently significant ($\beta = .22, sr^2 = .22, t = 3.17, p < .005$). Regression analyses predicting SAS scores or VAS liking of boys or girls were not statistically significant.

Discussion

The present study found that children's exposure to mass media was significantly associated with stigmatizing attitudes towards obese children. Replicating previous research on the relationship between screen time and body mass in children (Andersen, Crespo, Bartlett, Cheskin, & Pratt, 1998; Eisenmann, Barte, & Wang, 2002; Vandewater et al., 2004; Wake et al., 2003), the current findings also indicated a significant association between weekly TV use and the development of higher body mass. In addition, three distinct types of media used were examined in this study: TV, videogames, and magazines. The reason for examining these different types of media was to capture the diverse sources of children's exposure to popular cultural ideas. Furthermore, media types are used differently by girls and boys as demonstrated here, with boys spending more time on VG and girls spending more time on magazines. However, TV time emerged as the single predictor of BMI that was independently significant, even when considered alongside VG and magazines. This study also extended previous research by examining media use on weekdays and weekends separately. Weekday use of media emerged as the only independently significant contributor to BMI. This could be because during the week, TV viewing especially interferes with children's opportunities to participate in after-school sports and other school-based physical activity programs.

As hypothesized, media exposure was significantly associated with obesity stigma. Stigmatizing attitudes about obese children were associated with total media use, weekend media use, and VG playing time. In boys, obesity stigma was also associated with total TV viewing time. Greater dislike of obese children (boys

¹ It was also possible to compute relative liking as the difference between rankings of the overweight figure and the non-disabled, non-overweight figure of each sex; analyses using this measure of relative liking yielded the same results.

Table 3

Correlations between weekly media use, BMI, and stigmatization of obesity and facial disfigurement

Media consumption	BMI	SAS scores	VAS liking: obese girl	VAS liking: obese boy	Relative liking: obese girl	Relative liking: obese boy	Relative liking: FD girl	Relative liking: FD boy
TV-weekday	.20**	-.07	-.08	-.06	-.01	-.08	.06	.01
TV-weekend	.21**	-.11	-.07	-.09	-.02	-.09	.12	.01
TV-weekly	.23**	-.12	-.09	-.09	-.01	-.08	.10	.02
VG-weekday	.14*	-.13*	-.16*	-.05	.09	-.06	.03	-.06
VG-weekend	.05	-.07	-.11	.02	.10	-.11	-.02	-.12
VG-weekly	.09	-.10	-.14*	.00	.10	-.10	.00	-.11
Magazine-weekday	.15*	-.03	-.07	-.06	.11	.18**	.04	.12
Magazine-weekend	.06	-.05	-.10	-.11	.18**	.19**	.10	.15*
Magazine-weekly	.11	-.05	-.09	-.10	.17*	.21**	.08	.15*
All media-weekday	.26**	-.11	-.15*	-.09	.07	-.01	.06	.03
All media-weekend	.20**	-.13	-.14*	-.09	.08	-.06	.11	-.01
All media-weekly	.24**	-.14*	-.16*	-.10	.10	-.04	.09	.02

* $p < .05$, ** $p < .01$.

and girls) when compared to their peers was uniquely predicted by magazine reading time. The results suggest that both boys and girls may receive stigmatizing messages from videogames and magazines, and that boys in particular may also be vulnerable to the stigmatizing messages presented by television programs (Greenberg et al., 2003).

Magazine exposure stood out as uniquely associated with the relative devaluation of obese male and female peers. This is not surprising when considered in light of the consistent negative impact of fashion magazine photos on body image (Groesz, Levine, & Murnen, 2002). It is possible that magazines may be especially harmful because their pictures may be more extensively airbrushed and manipulated, and these images might be seen as more flawless than images on TV. The impact of such magazine photos has been shown to be stronger in younger aged participants (Groesz et al., 2002) and stronger in adolescents than adults (Shaw, 1995); the effect has also been documented in children (Martin & Gentry, 1997; Vaughan & Fouts, 2003). Less research has focused on the influence of magazine images in males, but some research has shown that men experience similar decreases in body satisfaction after viewing stereotypically attractive male models (Grogan, Williams, & Conner, 1996; Ogden & Munday, 1996). TV advertisements have also been shown to have a similar negative effect on body dissatisfaction in men and women (Hargreaves & Tiggemann, 2003a, 2003b; Lavine, Sweeney, & Wagner, 1999). Although another type of appearance-related stigma, facial disfigurement, was not as disliked as obesity, greater magazine use was also associated with greater dislike of boys with FD.

Though not measured here, those with high internalization of the thin ideal may be especially vulnerable to the negative effects of magazine images

(Yamamiya, Cash, Melnyk, Posavac, & Posavac, 2005). Other research has shown a link between the internalization of the thin ideal and obesity stigma in children (Davison & Birch, 2004) and adults (Vartanian, Herman, & Polivy, 2005). It is possible that both body dissatisfaction and obesity stigma are learned from magazines through the development of the stereotype that what is beautiful is good (Eagly, Makhijani, Ashmore, & Longo, 1991). This belief may lead some children, especially those with high acceptance of the thin ideal of beauty, to devalue their own body weight, while also teaching them to devalue others with above average body weights. Future research should examine thin-ideal internalization as a possible mediator of the effect of popular media on weight bias.

It is not surprising that participants' BMIs were unrelated to their levels of obesity stigma. This is consistent with previous research with adults (Latner, Stunkard, & Wilson, 2005; Lewis, Cash, Jacobi, & Bubb-Lewis, 1997; Wang, Brownell, & Wadden, 2004) and children (Davison & Birch, 2004; Kraig & Keel, 2001; Tiggemann & Anesbury, 2000). On the other hand, some research with large samples of adults has detected a modest association between body weight and degree of weight bias (Schwartz, Vartanian, Nosek, & Brownell, 2006). To our knowledge, this association has not been demonstrated among children.

The main limitation of this study was the cross-sectional nature of the data collection. As a result, it is unclear what direction of causality (if any) exists between some of the variables under investigation. It is possible, for example, that children with higher BMI spend more time using mass media on weekdays because they feel excluded from after-school activities with their peers. It is also possible that additional variables may influence both obesity stigma and media exposure, such as parental

internalization of the thin ideal. Such parental values could potentially lead parents both to teach their children to devalue obese peers and also to purchase popular magazines for their households. Another limitation was the self-reported assessment of media exposure, and future studies should consider using corroborating data from parents, siblings, or educators. In addition, future studies should seek to better establish the reliability and other psychometric properties of VAS measures of children's stigmatizing attitudes; test-retest reliability of the methods of stigma assessment used here has not been assessed. Finally, the effect sizes found in this study were small, and the results differed between the two measures of stigma used. The differences may have resulted from a lack of power; for example, regression analysis examining types of media use as predictors of VAS liking of overweight girls had a p value of .07, and this analysis might have reached significance with a somewhat larger sample.

Despite these limitations, the present study suggests an important link between media exposure and stigma-

tization of obese children. Research is needed to further explore and understand this link. For example, content analyses of obesity stigma in popular magazines and videogames (like the analysis of TV programs conducted by Greenberg et al., 2003) could pinpoint harmful sources of weight bias. The discovery of the sources of weight bias in popular media would allow researchers to target and prevent these messages from causing biased attitudes. For example, programs designed to protect young women against the body image decrease caused by magazines have demonstrated efficacy (Posavac, Posavac, & Weigel, 2001; Yamamiya et al., 2005). These programs might be especially useful for individuals who are most vulnerable to the effects of media on the development of weight bias, and future research should aim to identify individual differences that determine which children are most sensitive to these media effects. Ultimately, research on the identification of media sources that cause or perpetuate obesity stigma will help us to reduce the expression, and thus the transmission, of weight bias to children.

Appendix A. Stimulus figures



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