

OBESITY BIAS IN PRESCHOOL CHILDREN: DO THE OBESE ADOPT ANTI-FAT VIEWS?

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Abstract: This study investigated the extent of obesity bias among preschool children and examined whether anti-fat attitudes differ as a function of children's body size. Eighty-five 4- to 5-year olds (48 average and 37 obese) were assessed for obesity bias in two ways: a) by choosing their preferred playmate among thin, average and obese figures, and b) by assigning figures of varying size positive and negative characteristics following the narration of short stories. The results showed that the obese figure was the least selected, even more so by the obese who showed a strong preference for the thin figure. Obesity bias was strong and did not differ between the average and the obese. The exhibition of weight-related stereotypes by the obese highlights the pervasiveness of obesity stigma and calls of early intervention programs.

Key words: Body type, Body-weight stereotypes, Obesity bias

INTRODUCTION

Obesity is a major public health concern with numbers increasing globally (WHO, 2000). Childhood obesity has been the number one priority since the majority of these children will grow into obese adults (Guo & Chumlea, 1999) placing themselves at risk for a number of serious medical conditions such as cardiovascular diseases, diabetes and musculoskeletal disorders (Ford, Giles, & Dietz, 2002; Kriketos, Baur, O'Connor, Carey, King, et al., 1997; Must, Spadano, Coakley, Field, Colditz, et al., 1999; Wildman, Mackey, Bostom, Thompson, & Sutton-Tyrell, 2003). Obesity does not only raise health concerns. Obese people are vulnerable to social and psychological

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problems such as depression, low self-esteem, social withdrawal and isolation (Carpenter, Hasin, Allison, & Faith, 2000). There is a consensus among researchers that the main source of these problems lies in the social stigmatism of obesity (Puhl & Brownell, 2003). The stigma of obesity is so strong that body size concerns are common even among children (Collins, 1991; Davison, Markey, & Birch, 2003; Hill, 2007; Hill, Draper, & Stack, 1994).

The aim of this study was to investigate the prevalence and content of obesity bias at its onset: preschool age. In addition, the focus was on obese preschool children to examine their weight-related views, that is, whether they endorse or oppose anti-fat bias.

The obesity stigma: Its emergence and severity

According to Schwimmer, Burwinkle, and Varni, (2003, p. 1818) obesity has been described as “one of the most stigmatizing and least socially acceptable conditions in childhood”. A stigmatized person conveys a devalued social identity (Crocker, Major, & Steele, 1998) and is ascribed negative labels and attributes that are manifested through stereotypes, prejudice, bias and discrimination. There is well documented evidence that obese children are stigmatized by their peers (Brylinsky & Moore, 1994; Latner & Stunkard, 2003), teachers (Bauer, Yang, & Austin, 2004; Neumark-Sztainer, Story, & Harris, 1999), health professionals (Teachman & Brownell, 2001), even by their own parents (Crandall, 1995; Davison & Birch, 2004).

The question that arises is how early the obesity stigma develops. More than 50 years ago Richardson, Goodman, Hastorf, and Dornbusch (1961) asked school-aged children to rank in order of liking figures of children. The obese child was the least liked as a playmate among children on crutches, in a wheelchair, with a missing hand and a facial disfigurement. This finding has been replicated many times (Koroni, Garagouni-Areou, Roussi-Vergou, Zafiropoulou, & Piperakis, 2009; Latner & Stunkard, 2003), even with an updated version of this measure (Latner, Simmonds, Rosewall, & Stunkard, 2007). Obese children are the least liked among those with physical differences and disabilities and are evaluated more negatively for their personality and behavioral characteristics (Sigelman, Miller, & Whitworth, 1986). When compared to average and thin weight figures, heavy figures are assigned negative social and interpersonal attributes and are considered to be lazy, sad, mean, weak, less smart and more teased by others (Brylinsky & Moore, 1994; Powlisha, Serbin, Doyle, & White, 1994).

Searching for the onset of obesity bias studies have focused on preschool children. In the context of brief stories Cramer and Steinwert (1998) studied the attribution of a negative social characteristic, that of nice/mean, to thin and chubby figures in a sample

of 3- to 5-year old children. Although one characteristic is not sufficient to draw secure conclusions, the study clearly showed that the chubby drawing was selected significantly more often as “mean”. A more detailed study by Penny and Haddock (2007) showed that 5- to 8-year olds were more likely to choose the heavy figure as the story character with less academic, artistic, social and athletic abilities.

Other studies assessed obesity bias in preschool children by administering a playmate preference task (Cramer & Steinwert, 1998; Musher-Eizenman, Holub, Miller, Goldstein, & Edwards-Leeper, 2004). Children were shown the figures of two, three, or more children, one of whom was obese, and were asked to choose the one they liked most as a friend. The findings showed that the obese silhouette was rarely picked up as a friend.

The effect of body size on children’s anti-fat views

Despite the accumulating evidence for the prevalence of obesity bias in preschool years, less is known about the effect of children’s body size on their anti-fat views. It is not known whether the body-weight stereotypes of obese children are any different from those of their slim peers. Most studies have not taken into account the body size of the participants and its effect on their ratings. It is reasonable to assume that participants with excess weight will hold more positive views for obese figures than average-weight participants. According to the Social Identity Theory (SIT), children are expected to hold more positive views for children of their in-group as they are perceived to be more similar (Tajfel & Turner, 1979, 1986). However, the few studies that took into account the body size of the participants found it had no effect on the ratings (Counts, Jones, Frame, Jarvie, & Strauss, 1986; Cramer & Steinwert, 1998; Davison & Birch, 2004; Holub, 2008; Kraig & Keel, 2001; Latner et al., 2007; Lerner & Korn, 1972). A closer look, though, at these studies shows that obese children were often underrepresented in the samples, as their number ranged from one (Kraig & Keel, 2001) to twelve (Counts et al., 1986). In addition, the age range studied was rather limited (Davison & Birch, 2004; Hill & Silver, 1995; Holub, 2008) focusing on preadolescent samples (Latner et al., 2007), solely on boys (Lerner & Korn, 1972; Staffieri, 1967), or only on girls (Davison & Birch, 2004; Hill & Silver, 1995).

Moreover, research with obese adults is controversial. Wang, Brownell, and Wadden (2004) found that the obese devalue their self-worth and generate widespread attitudes, such as that the obese are lazy, less smart and nice in the same degree as the lean individuals. On the other hand, an online study involving a large sample (> 4000 individuals) of various body sizes found that there is an inverse relationship between body size and obesity bias (Schwartz, Vartanian, Nosek, & Brownell, 2006).

The findings on the effect of body size on children's anti-fat bias are fragmental and thus cannot provide conclusive evidence. There are no sufficient accounts for the body-weight stereotypes of obese preschool children, as most studies have focused beyond preadolescent samples, despite the early onset of the stigma. For this reason, the aim of this study was to focus on obese preschool children and examine whether they endorse or oppose anti-fat bias.

The implications of the study are important. Examining the strength and the context of obesity stigma at its onset can contribute in designing policies and interventions to eliminate it. This necessity stems from the fact that obesity stigma - unlike other types of stigma (e.g., race, mental illness) - can have harmful consequences not only for the stigmatized group (i.e., the obese children), but for everyone who endorses it, irrespective of his/her body size. Obesity stigma contributes to idealize even further the slim body, increasing the risk for body dissatisfaction and dieting concerns even among the thin ones (Hill, 2007). It is alarming that in a study of 7- to 12-year-olds Truby and Paxton (2002) found that 42% of the girls and 31% of the boys wanted to be thinner, while 55% of the girls and 45% of the boys picked as an ideal body size the very thin figures below the 10th percentile. Body dissatisfaction, in turn, is one of the prime risk factors for eating disorders and harmful dieting behaviors (for a review see Ricciardelli & McCabe, 2001). The stigma of obesity is considered to fuel such concerns and behaviors (Puhl & Brownell, 2003).

On the other hand, obesity stigma can be harmful for the obese individuals in a number of ways: they are aware of the societal stereotypes for obesity, they are subject to prejudice and discrimination and tend to apply the negative stereotypes to themselves (self-stigma or internalized stigma), suffering from diminished self-esteem and self-efficacy (Puhl & Brownell, 2003, Schwartz & Puhl, 2003). Accumulating evidence stresses the psychosocial and physical health consequences of the stigma across ages (for review see Wardle & Cooke, 2005 and Puhl & Latner, 2007). Given the significance of children's early experiences in the formation of their self-identity, it is important to study obese children's stereotypes about obesity. If they oppose anti-fat views, then there is good ground to build their resistance to stigmatizing behaviors and develop a positive self-identity. If, on the other hand, they themselves endorse anti-fat bias then they are at increased risk for psychosocial and social adjustment problems (Britz, Siegfried, Ziegler, Lamertz, Herpertz-Dahlmann, et al., 2000; Erickson, Robinson, Haydel, & Killen, 2000; Strauss & Pollack, 2003; Stunkard, Faith, & Alison, 2003; Zeller, Reiter-Purtill, & Ramey, 2008).

To summarize, the present study had the following aims:

- a. To examine the content and the prevalence of obesity bias in preschool children.
- b. To examine the effect of body size on children's anti-fat views by comparing obesity bias between average and obese children.

METHOD

Participants

Eighty-five nursery children took part in the study. The children were classified either average-weight or obese. The average-weight group consisted of 48 children (26 girls and 22 boys) with a mean age of 64 months (age range 58-67 months) and a mean Body Mass Index (BMI) of 15.43. The obese group consisted of 37 children (17 girls and 20 boys) with a mean age of 66 months (age range 59-68 months) and a mean BMI of 20.70.

BMI was calculated as the ratio of the weight (in kg) to the square of the height (in meters). Children were classified as average or obese following the cut-off points suggested by Cole, Bellizzi, Flegal, and Dietz (2000) based on international data. The cut-off points for classifying a child as obese depend on the child's age and gender: girls had to have a BMI greater than 19.17 and 19.34 at the ages of 5 and 5.5 respectively, while boys had to have a BMI greater than 19.30 and 19.47 at the same ages to be considered as obese. Children were attending middle-class city schools and were predominantly of Greek origin.

Overweight children were not included in the sample because they are considered to be *at risk* for obesity. Since the primary aim of the study was to compare the obese with the average-weight, the overweight could not be merged either with the obese or with the average.

Measures

The assessment of obesity bias

Obesity bias was assessed using the following two methods:

a) Adjective attribution in the context of a story. To assess the content and the development of obesity bias we adopted the storyline method initially introduced by Cramer and Steinwert (1998), as the most age appropriate. Doubts have been raised whether pre-school children are able to use checklists or rate the intensity of abstract characteristics in a Likert scale (Smolak, 2004), methods widely used in the study of obesity bias.

In order to tap on a wide range of weight-related stereotypes, a series of 13 short stories was designed. Obesity bias was assessed across the domains of social, academic, athletic and artistic competence as Penny and Haddock (2007) did. The

domain of personal qualities was added in this study as obese children are often assigned negative personal characteristics. All these domains are vital in the everyday functioning of a young child. The advantage of this approach is that obesity bias can be: a) assessed in each domain, and b) calculated as a composite scale.

The children were read short stories. Each story had two same sex characters that differed in one particular ability/quality. The abilities and qualities examined across each domain were the following:

a) *Social competence* stories were about children's ability for: i) friendship, ii) sharing, and iii) cooperation.

b) *School competence* stories dealt with children's ability to perform school type activities like: i) writing, and ii) mathematics.

c) *Athletic competence* stories were about sports abilities such as: i) running, and ii) swimming.

d) *Art stories* dealt with activities such as: i) drawing, and ii) singing.

e) *Self quality* stories referred to personal characteristics such as: i) happy/sad, ii) satisfied/unsatisfied for his/her accomplishments, iii) diligent/lazy, and iv) brave/coward.

An example of the friendship scenario is: "The bell rang and all the kids run into the school yard to play. Nick rushed out with his friends and played football. Greg does not enjoy break time because he does not have a friend to play with. He usually sits on the bench and watches the other kids play".

At the end of each story the experimenter presented each participant with two sets of three children's figures each (Figure 1). The figures within each set were

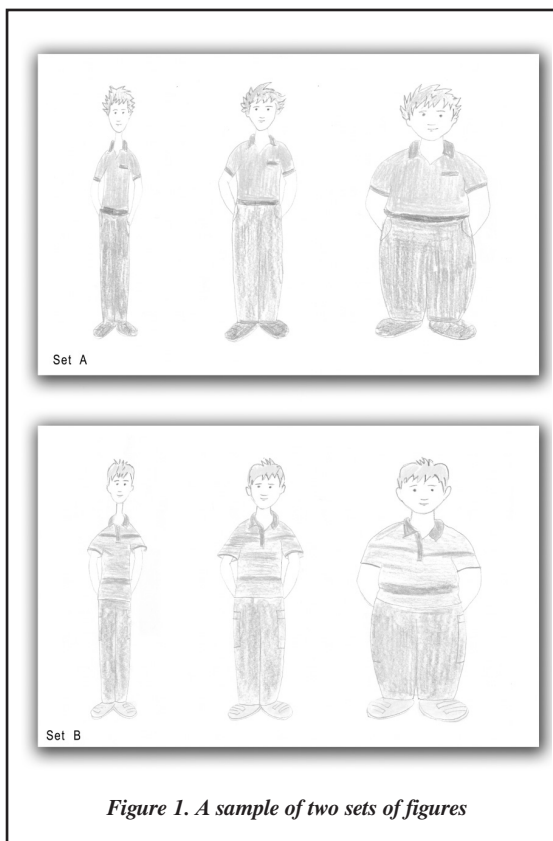


Figure 1. A sample of two sets of figures

identical in facial features, attire and hair and had the same neutral expression. The figures varied only in terms of their body size: one was thin, one was average and one was obese. The experimenter pointed to the first set (Set A) and asked the child “Which of these three figures is Nick who has friends at school?” Following the child’s response the experimenter pointed to the second set (Set B) and asked “Which of these three figures is Greg who does not have friends at school?”

An important advantage of this procedure is that the drawbacks of the forced-choice answers were eliminated. The participants had the choice to attribute the positive and negative characteristics of the story protagonists to figures of any, even of the same body size.

Male participants were read stories with male characters and female participants were read the same stories with female characters. The order of the stories and the presentation of the figure sets varied randomly across the participants.

A total of 52 sets of figures were drawn for the 13 scenarios: 26 sets had female figures and 26 sets had male figures. All figures were drawn by a professional.

b) *The playmate preference task.* The playmate preference task was another measure of obesity bias. Children were presented with three figures: a thin, an average and an obese and were asked to pick up the one they preferred as a playmate. Boys were presented with male and girls with female figures. The figures corresponded to the ones depicted in Collins’ (1991) pictorial instrument in the 1st, 4th and 7th position.

Procedure

The study was conducted in accordance to the ethical guidelines of the British Psychological Society. Parents’ informed consent was obtained prior to testing.

Children’s height and weight were measured by a trained assistant. Testing took place about a month after anthropometric measures, rather than on the same day, in order to prevent children from associating the two processes.

The children were interviewed individually in a quiet area of their school building. The playmate preference task was presented first. The children were asked to look at the figures and pick up the one they liked most as a friend. Then they were told that they were going to hear stories about different characters. Each scenario was read aloud to the child. Following the story the children were shown three figures and were asked to pick up the one they thought looked mostly like character A. Subsequently, a different set of three figures was shown and the children had to choose the one that looked mostly like character B. It was made clear at the beginning that there were no right or wrong answers. The stories were presented in a ran-

dom order across the participants. In half of the stories the positive qualities were possessed by the first presented character and in the other half by the second character. The sets of figures were presented in a counterbalance order. The procedure lasted approximately 20 minutes.

RESULTS

The assignment of positive and negative attributes in the story context

In order to examine whether preschool children hold anti-fat views and the effect of their body size on these views, we analyzed the assignment of positive and negative attributes to the figures (thin, average, obese) across the 13 stories for the average (A-G) and the obese (O-G) group. The assignment of the positive attributes is presented in Table 1, while the assignment of the negative attributes is shown in Table 2. The analyses showed that gender did not affect children's responses. More specifically, chi-square tests for the assignment of the twenty-six attributes (thirteen positive and thirteen negative)¹ across gender yielded p values $> .11$. For this reason gender was not taken into account in the subsequent analyses.

The majority of children, irrespective of their body size, attributed the positive attributes mostly to average and thin figures, while the obese figure was chosen by a minority. This pattern was evident both in the A-G and the O-G. In order to determine whether the distribution of choices was affected by children's body size chi-square tests were performed. As can be seen in Table 1, body size by and large did not affect the attribution of the positive characteristics. Singing ability and diligence were the only attributes that the O-G highly assigned to thin figures compared to the A-G.

¹ In detail, for each positive attribute the chi-square tests were as follows: Friendship, $\chi^2(2, N = 85) = 2.33, p = .31$; Sharing, $\chi^2(2, N = 85) = 3.07, p = .21$; Cooperation, $\chi^2(2, N = 85) = .43, p = .80$; Writing, $\chi^2(2, N = 85) = 1.37, p = .50$; Mathematics, $\chi^2(2, N = 85) = .11, p = .94$; Running, $\chi^2(2, N = 85) = .41, p = .81$; Swimming, $\chi^2(2, N = 85) = 2.33, p = .31$; Drawing, $\chi^2(2, N = 85) = 3.69, p = .15$; Singing, $\chi^2(2, N = 85) = 2.34, p = .31$; Happiness, $\chi^2(2, N = 85) = 2.29, p = .31$; self-satisfaction, $\chi^2(2, N = 85) = .05, p = .97$; Diligence, $\chi^2(2, N = 85) = 2.57, p = .27$; Braveness, $\chi^2(2, N = 85) = 2.60, p = .27$. For each negative attribute the chi-square tests were: Friendship, $\chi^2(2, N = 85) = .95, p = .62$; Sharing, $\chi^2(2, N = 85) = 0.44, p = .80$; Cooperation, $\chi^2(2, N = 85) = 1.41, p = .49$; Writing, $\chi^2(2, N = 85) = 3.70, p = .15$; Mathematics, $\chi^2(2, N = 85) = .27, p = .87$; Running, $\chi^2(2, N = 85) = 2.89, p = .23$; Swimming, $\chi^2(2, N = 85) = 2.88, p = .23$; Drawing, $\chi^2(2, N = 85) = 3.28, p = .11$; Singing, $\chi^2(2, N = 85) = 2.17, p = .33$; Happiness, $\chi^2(2, N = 85) = 1.69, p = .42$; Self-satisfaction, $\chi^2(2, N = 85) = 1.37, p = .50$; Diligence, $\chi^2(2, N = 85) = 3.61, p = .16$; Braveness, $\chi^2(2, N = 85) = 3.08, p = .21$.

Table 1. Children's positive attributions (%) by body size

	A-G			O-G			$\chi^2(2)$	<i>p</i>
	Figures			Figures				
	thin	average	obese	thin	average	obese		
Friendship	14.6	83.3	2.1	18.9	73	8.1	2.13	.34
Sharing	14.6	85.4	-	29.7	67.6	2.7	4.41	.11
Cooperation	27.1	70.8	2.1	24.3	64.9	10.8	2.87	.23
Writing	20.8	77.1	2.1	21.6	70.3	8.1	1.74	.41
Mathematics	20.8	64.6	14.6	18.9	70.3	10.8	.36	.83
Running	35.4	60.4	4.2	51.4	43.2	5.4	2.48	.28
Swimming	50	43.7	6.3	29.7	62.2	8.1	3.55	.16
Drawing	27	68.8	4.2	27	62.2	10.8	1.44	.48
Singing	10.4	74.2	10.4	40.5	54.1	5.4	10.62	.005
Happiness	12.5	70.8	16.7	21.6	73	5.4	3.32	.19
Self-satisfaction	14.6	79.1	6.3	27	59.5	13.5	3.93	.14
Diligence	18.7	64.6	16.7	45.9	45.9	8.2	7.52	.02
Braveness	35.4	60.4	4.2	29.7	56.8	13.5	2.46	.29

Regarding the attribution of the negative characteristics the A-G tended to assign the negative characteristics mostly to the obese figure. The percentage that picked the obese figure for the negative characteristic was high and ranged from 50% to 87.5%. In a similar fashion, the majority of the O-G picked the obese figure as the one possessing the negative attribute with percentages ranging from 51.4% to

Table 2. Children's negative attributions (%) by body size

	A-G			O-G			$\chi^2(2)$	<i>p</i>
	Figures			Figures				
	thin	average	obese	thin	average	obese		
Friendship	6.3	10.4	83.3	16.2	21.6	62.2	1.66	.43
Sharing	27.1	10.4	62.5	18.9	18.9	62.2	4.93	.08
Cooperation	4.2	8.3	87.5	10.8	-	89.2	4.39	.11
Writing	29.2	20.8	50	21.6	21.6	56.8	.64	.72
Mathematics	22.9	25	52.1	27	18.9	54.1	.50	.77
Running	12.5	6.3	81.2	10.8	13.5	75.7	1.30	.52
Swimming	16.7	14.5	68.8	18.9	16.2	64.9	0.14	.93
Drawing	16.7	25	58.3	24.3	29.7	45	1.39	.49
Singing	18.9	27.1	54	18.9	16.2	64.9	1.51	.47
Happiness	22.9	8.3	68.8	21.6	21.6	56.8	3.10	.21
Self-satisfaction	27.1	8.3	64.6	21.6	24.3	54.1	4.13	.12
Diligence	14.6	22.9	62.5	21.6	13.5	64.9	1.58	.45
Braveness	12.5	10.4	77.1	35.1	13.5	51.4	7.05	.02

89.2%. In order to examine the effect of children's body size on the distribution of their choices chi-square tests were performed. As can be seen in Table 2, the two groups differed only in the distribution of choices for braveness: the O-G attributed less braveness to obese and more to thin-size figures compared to the A-G.

Obesity bias

Apart from exploring the distribution of positive and negative attributes across the stories we were also interested in examining how the children assigned the positive and the negative qualities to the characters within each story. As obesity bias we defined the condition where a child assigns the negative quality to the obese figure and the corresponding positive one to the average or the thin figure. The children who assign the positive characteristic to the obese figure cannot be blamed for obesity bias, no matter how they assigned the negative quality. For each child a new binary variable was created for each story that indicated whether his/her pattern of assigning the positive and negative characteristic constituted bias or not. A composite measure of general obesity bias (Obesity Bias Index - OBI) was constructed, by adding all 13 specific bias-indicating binary variables. OBI values could range from 0 (total absence of bias) to 13 (bias in each and every characteristic). High OBI values designate more anti-fat bias. The internal consistency of the OBI was satisfactory (Cronbach's $\alpha = .83$).

An independent samples t-test was performed to examine whether the two groups differed on OBI scores. Although, the O-G had a lower mean OBI score ($M = 7.83$) compared to the A-G ($M = 8.56$), the difference was not significant, $t(83) = .97, p = .33$.

We further investigated the effect of body size (O-G vs. A-G) on obesity bias into each of the 5 domains that were examined. Since the number of items that make up each domain varied, the total score for each domain was divided by the number of its items, in order to have all domain scores in the same normalized scale, ranging from 0 to 1.

Table 3. Mean and standard deviation of the normalized domain scores by body size

Domains	A-G		O-G	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Social	.77	.27	.68	.34
Academic	.51	.45	.54	.43
Athletic	.75	.38	.70	.39
Artistic	.54	.39	.55	.40
Self-qualities	.65	.34	.54	.33

These scores were subjected to a 2 (body size) x 5 (domains) Analysis of Variance (ANOVA) with repeated measures on the last factor. The results revealed a significant main effect of domain, $F(4, 80) = 9.03$ $p < .001$, partial $\eta^2 = .31$ (Table 3). Post-hoc Bonferroni adjusted t-tests showed that: a) in the social domain obesity bias was significantly higher than in the academic ($p < .001$) and the artistic domain ($p = .001$) and the personal qualities ($p = .008$); b) academic bias was significantly higher than the athletic bias ($p = .01$), and c) the athletic bias was higher than the arts bias ($p = .01$). No body size, $F(1, 83) = 4.77$, $p = .47$, partial $\eta^2 = .006$, or interaction effects, $F(4, 80) = 1.12$, $p = .35$, partial $\eta^2 = .05$, were detected.

The playmate preference task

In the playmate preference task the children had to indicate their preferred playmate among three figures that represented the thin, average and obese body size. Children's preference for the average or thin figure and avoidance of the obese one was another measure of obesity bias.

The majority of children picked up the average (55.3%) and the thin (38.8%) figure as their preferred playmate, while the obese was chosen by the minority (5.9%). In order to examine whether playmate preference was affected by children's body size a chi-square test was performed, $\chi^2(2, N = 85) = 5.78$, $p = .05$. As can be seen in Table 4, two thirds of the A-G preferred the average size figure, while the O-G showed a strong preference (51.4%) for the thin figure. Children's choice was not affected by their sex, $\chi^2(2, N = 85) = .09$, $p = .95$, neither across the A-G, $\chi^2(2, N = 48) = 1.63$, $p = .44$, nor across the O-G, $\chi^2(2, N = 37) = 3.22$, $p = .20$.

Table 4. Children's preferred playmate (frequencies and percentages) across the average and the obese group

Preferred playmate	A-G	O-G	Total
Thin	14 (29.2)	19 (51.4)	33 (38.8)
Average	32 (66.7)	15 (40.5)	47 (55.3)
Obese	2 (4.1)	3 (8.1)	5 (5.9)

DISCUSSION

The aim of this study was to access the prevalence and the content of obesity bias among preschool children. Moreover, the study aimed to focus on obese preschool children, a group largely overlooked by existing research, and examine whether they

adopt or dismiss weight-related stereotypes. For this purpose, obesity bias was examined in a group of average and a group of obese children by implementing two measures: an ability/quality attribution task within a story context and a playmate preference task.

The design of the story task allowed the assessment of a variety of qualities and abilities across a number of domains using a child-friendly approach and avoiding forced-choice methods that have been extensively used. Moreover, a stringent criterion was applied for an operational definition of obesity bias that depended on the pattern of assigning the positive and the negative quality for each attribute. Even with this rigorous criterion, obesity bias was found to be present and strong among preschool children independent of their body size. Preschool children tended to assign the negative qualities to the obese figures, while the positive characteristics were assigned firstly to the average and secondly to the thin figure. This finding is in accordance with prior studies examining the prevalence of obesity bias among preschool children (Cramer & Steinwert, 1998; Musher-Eizenman et al., 2004; Penny & Haddock, 2007). Similarly, in the playmate preference task, the average and the thin figures were the most wanted. It is interesting that the obese expressed a strong preference for the thin figure, a finding also reported by Cramer and Steinwert (1998). This tendency possibly reflects the obese children's desire for a slim body.

The findings of the study suggest that obesity bias is present at preschool age and it is independent of children's body size. The fact that obese children hold anti-fat views does not seem to favor the viewpoint that children stigmatize those who are different from themselves or that members of the in-group favor those who belong in the same group. Although obesity bias was less among the obese children, this difference failed to reach significance, contrary to the expectations of the SIT. This finding clings with the findings of other studies that found no association between children's BMI and their anti-fat views (Counts et al., 1986; Davison & Birch, 2004; Hill & Silver, 1995; Holub, 2008; Latner et al., 2007). Unlike other stigmatized cultural or ethnic groups that hold favorable attitudes towards their in-members (Bigler, 1995; Nesdale, Durkin, Maass, & Griffiths, 2004; Nesdale, Maass, Griffiths, & Durkin, 2003), even at the age of three (Yee & Brown, 1992), obese children do not seem to develop this positive in-group identity.

The finding that young obese children hold strong anti-fat views was alarming. As beliefs and attitudes mediate affects, it is possible that this can lead to the development of a devaluated self-identity (for a review see French, Story, & Perry, 1995 and Λεονταροῦ, 2011) evident already at the age of 9 (Phillips & Hill, 1998). Although, to the best of our knowledge, there is no research on the effect of anti-fat views on the

self-esteem of obese children, there are some speculations for its possible effect from adult research. Crandall and Biernat (1990) showed that obese adults with strong anti-fat views had lower self-esteem compared to those with less anti-fat attitudes. Moreover, Friedman, Reichmann, Costanzo, Zelli, Ashmore, et al. (2005) found that negative views about weight in the obese were associated with poor psychological adjustment such as high levels of depression, low self-esteem and body image disturbance.

The adoption of anti-fat views by the obese is another manifestation of the stigma pervasiveness. Rudman, Feinberg, and Fairchild (2002) state that the obese are victims of a “false consciousness”, i.e., of the tendency to implicitly accept the society’s devaluated orientation towards their in-group. To some extent this finding reflects the position of the obese within the society (Hogg & Turner, 1987) as negative self-stereotyping has been reported mainly within members of low-status groups (Glick & Fiske, 2001; Jost & Banaji, 1994). Although there is no much evidence on how obesity stigma is internalized by the obese children, it seems that stigmatizing messages from peers (Gray, Kahhan, & Janicke, 2009 for a review), educators (Greenleaf & Weiller, 2005; Hague & White, 2005; Neumark-Sztainer, Falkner, Story, Perry, Hannan, et al., 1999), parents (Davison & Birch, 2004; Neumark-Sztainer et al., 2002; Puhl & Brownell, 2006) and the media (Greenberg, Eastin, Hofshire, Lachlan, & Brownell, 2003) increase the possibility of internalization (Puhl & Latner, 2007). Thus, it is likely that stigma internalization is primarily a consequence of other’s reactions towards the obese and has less to do with their weight per se. There is evidence that weight-related teasing and victimization mediates the relationship between obesity and body dissatisfaction, low self-esteem, depression and eating disorders (Eisenberg, Neumark-Sztainer, & Story, 2003; Hayden-Wade, Stein, Ghaderi, Saelens, et al., 2005; Neumark-Sztainer et al., 2002). Davison and Birch (2002) showed that peer teasing and parent weight-criticism mediated the relationship between weight status and self-concept already at the age of 7, while appearance-related teasing by parents and siblings predicted body dissatisfaction among school girls even after controlling for BMI (Keery, Boutelle, van de Berg, & Thompson, 2005). These findings suggest that significant others’ negative reactions towards obesity can harm the development of the self-concept in children and lead to self-stigmatizing attitudes. The role of the media in spreading obesity stigma and advertising the thin ideal has also been pinpointed. An analysis of how the obese are portrayed in popular TV shows revealed that they are often casted in a stereotypical fashion (Greenberg et al., 2003). This explains why increased TV viewing at the ages of 6 to 8 is related to more negative stereotyping of an obese target (Harrison, 2000). Contrary to other forms of stigmatism (e.g., racial) it is alarming that weight stigmatism is overt and still socially acceptable. This legitimization stems partially from the conservative values of indi-

vidualism, discipline and self-control that assert that people get in life what they deserve, assuming that the obese are personally responsible for their situation (Crandall & Martinez, 1996; Crandall & Schiffhauer, 1998). This explains why obese children who perceive themselves as responsible for their weight are more vulnerable to psychosocial adversities compared to those who attribute their weight to external and uncontrollable factors (Pierce & Wardle, 1997). Self-stigmatism is a rather complex process where stigmatizing experiences (weight-related teasing and victimization) and socio-cultural influences (exposure to the thin ideal, media etc) interact with a child's weight, age, attributions and psychological make-up (for a review see Puhl & Latner, 2007).

In this study obese figures were rarely picked up as preferred playmates. Someone can argue that these findings have restricted ecological validity as in real life the choice of a friend does not depend solely on looks. However, a growing body of research shows that this is not the case only with lifeless figures. Strauss and Pollack (2003) in a large epidemiological study investigating the social networks of average and overweight adolescents aged 12-18 years found that they were more peripheral and more isolated than their average-weight peers. They were less likely to be chosen as friends and those who nominated them tended to be less popular themselves. A similar pattern of results was found in a study assessing the peer relations of a clinically referred obese group aged 8-16 year (Zeller et al., 2008). The majority of obese was not friendless, but was less liked and had fewer friends at school. There is no evidence available for younger children. Since obesity bias has been detected at preschool age, future studies should examine the actual social status of obese children in their classroom environment. Identifying their peer relations and the factors that contribute to poor peer interactions can help designing effective intervention programs.

The findings of this study may serve as the starting point for building up future studies as it raises some interesting questions. We need to examine the developmental trajectory of obesity bias across different body types. Longitudinal data are needed to find out if obese children continue to endorse anti-fat attitudes during their childhood and adolescence and how this relates to their psychosocial functioning. The endorsement of anti-fat views is likely to affect their body image, self-esteem and possibly the way they respond to stigmatizing experiences. Research with obese adults has shown that those who hold strong anti-fat views find stigmatizing experiences particularly damaging (Friedman et al., 2005). To the best of our knowledge there is no such evidence available for obese children. Moreover, we do not know if, and in what ways, the adoption of anti-fat views by the obese children affects their motivation to control their weight and their dietary habits.

A potential limitation of the study lies in the fact that the children were grouped into average and obese based on their BMI. They were not asked how they perceive their body size or if they identify with the group to which they were assigned. There is some evidence showing that young children, and especially the obese, tend to underestimate their body size (Collins, 1991; Cramer & Steinwert, 1998; Hussin, Mohammad, Al-Hamad, Makboul, & Elshazly, 2011; Truby & Paxton, 2002). If obese children do not identify with their in-group, then it is easier to adopt stereotypes that do not favor excess weight. Although this possibility cannot be ruled out, the strong preference that the obese exhibited for the thin playmate suggests that they were not unaware of their body size. Future studies should take into account the role of perceived body type into children's anti-fat attitudes. There are some indications recently that children who perceive themselves heavier are holding less anti-fats views (Holub, 2008; Spiel, Paxton, & Yager, 2012), but these studies do not provide information on how obese children perceive themselves and how their perceived body size is related to their anti-fat views.

An inherent methodological limitation of the studies assessing obesity bias is whether children's responses reflect their awareness or the endorsement of the anti-fat views. We believe that the discrepancy in the level of obesity bias found across the domains suggests that the children were expressing their personal views.

The prevalence of obesity bias among preschool children underscores the need for designing and implementing intervention programs. The limited impact of interventions targeting adolescents and adults (for a review see Daníelsdóttir, O'Brien, & Ciao, 2010) suggests that interventions should start early, before negative attitudes are firmly rooted. However, only a handful of studies have challenged anti-fat attitudes in childhood. Studies that aimed to modify views about the controllability of weight, by attributing weight to medical conditions showed either no difference (Anesbury & Tiggemann, 2000) or limited effect in negative stereotyping (Bell & Morgan, 2000). Other studies aiming to reduce obesity stigma by evoking empathy and positive feelings to obese children were not successful (Haines, Neumark-Sztainer, Perry, Hannan, & Levine, 2006).

Our finding that obese children adopt anti-fat views suggests that interventions should be implemented with caution as they can further stigmatize obese children. Interventions that attribute weight to medical and uncontrollable conditions present the obese in a negative light. This message can inflate feelings of helplessness and diminish their efforts to control their weight. Programs that target to evoke empathy depict the obese as pity worthy, instead of presenting them in a positive manner (Daníelsdóttir et al., 2010). To our view obesity stigma interventions in childhood should be embedded within a broader framework that aims to promote

acceptance, respect and equality irrespective of body size, color, race, religion, ability and so forth. In addition, schools should implement policies that will not tolerate teasing and victimization for any reason including weight. At the same time school should promote a health curriculum, not by placing emphasis on weight and appearance - that will further stigmatize the obese and reinforce body-image concerns in the normal weights - but by promoting healthy eating and living behaviors (Koplan, Liverman, & Kraak, 2005). Irving (2000) was successful in implementing a puppet show program that aimed to promote body size acceptance by discouraging teasing and encouraging elementary school children to treat everybody well. Reduction in negative stereotyping of obese figures was reported at the end of the program, but the results should be treated with caution due to methodological flaws. More research in this direction is needed.

The findings of the study suggest that obesity stigma is widespread even among preschool children. Obese children are as likely as their lean peers to adopt anti-fat views. Unlike other stigmatized groups, the obese “do not have the protective barrier that in-group preference provides” (Wang et al., 2004, p. 1337). The challenge for future research would be to develop intervention programs to alleviate negative body-weight attitudes, while promoting healthy eating and living habits. These programs should focus on young children, targeting bias at its onset.

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