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The bigger picture: young children's perception of fatness in the context
of other physical differences

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Running title: Young children's perception of obesity

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ABSTRACT

Background: Negative obesity stereotypes and anti-fat attitudes have been observed in children from age three. It is uncertain whether this is specific to fatness or generalizable to other visible differences.

Objectives: To determine whether young children base decisions about qualities in others and friendship choices more on fatness than other visible differences between people.

Methods: Using a personal construct theory approach, 85 children (mean age 5.7, 42 girls) completed a simple repertory grid. The children were asked about differences (constructs) between four illustrations (elements) that showed children as healthy weight, fat, the opposite gender, and in a wheelchair. Children were also asked about friendship with the illustrated children and self-image preferences. Their answers were grouped using thematic analysis.

Results: The fat, opposite gender, and wheelchair-bound characters were equally chosen by children as different to the standard character. When identifying differences, fatness or body shape was referred to significantly less than gender or being in a wheelchair. Children were more likely to reject an opposite gender character as a friend, or as someone they would like to be, than to reject the fat character. Only one child, themselves overweight, voiced strong anti-fat attitudes.

Conclusions: Apparent negativity towards fatness is fostered by failure to consider other visible differences and by children's 'like me' peer preferences. It was less desirable in the eyes of most 5-year old girls to be a boy than to be fat. This offers some reassurance to those working to improve children's health literacy in obesity.

INTRODUCTION

Children and young people with obesity face stigma that impacts on efforts towards obesity prevention and management (1). Research documenting children's reactions to fat body shapes has been integral to developing our understanding of weight stigma. The foundations were laid over half a century ago in work with 10-11 year olds (2). Asking children, "Which boy (girl) do you like best?" from six drawings of children with different physical appearance or disabilities, most left the fat child as their last choice.¹ This discrimination has persisted. Some 40 years later, pre-teenagers were even more dismissive of the child drawn as fat (3). Although obesity had become more prevalent (and visible), there was no amelioration in children's weight bias.

Social rejection, as modelled by the choices children make between different body shape drawings, has been observed in real-life settings such as the classroom (4) and in victimization by peers (5,6). Negativity to overweight has also been observed at pre-school age (7-9). That American 3-5 year olds express these views is taken as a mark of how engrained anti-fat attitudes are as social values, and of how vulnerable young children are to the sources of this information.

Methodologies typical of past studies have undoubtedly favoured a conclusion of weight bias. Determining a rank order of liking may suggest preference but it reveals little of how negative these attitudes are. Vanilla ice cream may be low in a list of a child's preferred flavours but ice cream is still a strongly liked food. Accordingly,

¹ The language used by children has guided the terminology in this paper. Throughout the tasks, the children most often used the word "fat" when describing the image of the overweight character. 'Obesity' will be used to refer to the health condition.

studies that only report rankings are likely to have overestimated the negativity that children have towards fatness (4,10). An alternative approach has been to ask children to match adjectives such as 'lazy', 'dirty', 'ugly', to either thin or fat drawings of people (11,12). This restricts children's choices in that each word has to be matched to one of two body shapes. Without any other visible difference to select from, fatness is the obvious direction for negativity.

Qualitative research approaches offer a more child-centric perspective. They solicit what children have to say about body size, shape, weight, or obesity, and reveal an understanding that becomes nuanced with age. Younger children (4-6 year olds) speak about some of the likely social and physical consequences of changing from thin to fat, and vice versa (13). They are already at an age where they are sensitive to and able to reflect back societal information about body size. Older primary school-aged children distinguish desirable and undesirable bodies and consider body size in making judgments about others (14). But this still leaves questions regarding how body size or fatness compares with other ways in which people's appearance differs. If weight bias is so prominent, does it overshadow young children's decisions about desirable and undesirable qualities in others and friendship choices, over and above other physical differences between people?

The present study used a personal construct approach to investigate young children's perception of fatness in the context of other visible differences. Personal construct theory is a psychological perspective directed to understanding the way that individuals construe their own world (15). It is advocated in working clinically and in research with children (16). People's theories about the world are generated from constructs. Repertory grids are used to elicit and examine constructs and a simple grid methodology was used in the present study. Based on the research

cited above it was hypothesized that young children would choose fatness as the feature that most distinguished between characters who differed in body shape, gender, and physical ability. Additionally, the fat character would be the least likely chosen as a friend, fatness would be the most undesirable characteristic in friends, and a fat character seen as someone they would least like to be. Potential differences between girls' and boys' responses were examined, as were those of children who were themselves overweight.

METHOD

Participants

Eighty five children (42 girls and 43 boys; mean age 5.7 years; range 4.3 to 7.1) from two primary schools in the north of England took part in the study. The schools were state schools in areas where people were mainly of low to middle socioeconomic status. Children were in reception class, and years one and two of the national curriculum in England. Information about the study was sent to parents and 90 provided consent for their child's participation. Of these, one child failed to provide their assent and four failed to understand the study task. No child had a visible physical disability and 61% were white British, 31% south Asian, 5% black, and 3% 'other' family ethnicity. Ethical approval for the study was granted by the Leeds School of Medicine Research Ethics Committee.

Materials

Character drawings. Adaptations of professionally illustrated characters drawn for previous studies (4,13) were used in this research. They comprised drawings of children who differed visibly in a number of characteristics including body size,

gender, physical ability, clothing, and hairstyle. Two sets of characters were available, one each for male and female participants (Figure 1). An additional card marked 'YOU' was used to represent the participant.

Character assessment. Repertory grids are a means to elicit the personal understandings (known as constructs) that an individual holds about different people, events, or objects (elements). The grids were designed with each of the four characters (elements) along the top (Figure 1). For the first section of the task, the grid provided space for three bipolar constructs to be recorded and had four further rows for recording the answers to the second part of the task.

Body size rating. The body figure scale by Collins (17) was used to estimate the body size of each participant. This pictorial scale features seven preadolescent figures of increasing body size but has uncertain psychometrics for use by young children (18). Therefore, the body size of each participant was estimated by the researcher and matched to one of the figures.

Procedure

The researcher met with each child in a quiet area of the classroom or school. The child's assent was obtained, the audio recorder started, and the corresponding gender character set and repertory grid selected. The researcher spread the four character illustrations out on the table in front of the participant, with the 'YOU' card remaining out of sight.

The standard character was placed directly in front of the participant. The child was first asked, "Please pick the picture of the child that you think is most different to this one." Their selection was then placed next to the first image and the two remaining

pictures were turned face down. They were asked, "What is most different between these two pictures?" If the child provided a number of differences, they were prompted to select the most important (construct). All cards were then turned face down and the child was asked whether they would prefer to be friends with a child who was either of these opposites, for example, if the child identified hair colour as the difference they were asked, "Would you prefer to have a friend who has blond hair or brown hair?" They were then asked to say why they would rather be friends with their choice of character.

All pictures were then turned face up and the selected 'most different' picture placed in front of the child. The participant was then asked to identify which character they thought was most different to the one in front of them, but for a reason other than the one they just gave. The previously outlined procedure was then repeated until three sets of constructs and friendship selections had been recorded.

Finally, the researcher placed the "YOU" card in front of the child and explained that this card was being used to represent them. The child was asked, "Please pick the picture of the child who you think is most similar to you?" and then, "Why did you pick that one?" This was repeated for the character they were most different to. The child was then asked, "I want you to pretend that I have a magic wand and I am going to turn you into one of these children. Which one would you most like me to turn you into?", and then which they would least like to be. The audio recording was then stopped and the child was allowed to choose a reward sticker to thank them for their participation.

Data analysis

The elicited constructs were organised into categories to summarise the children's main reason for their choice. Those representing a primary difference (gender, weight, wheelchair) were distinguished from those of secondary difference (hair, clothes, height, other). Descriptive statistics and chi-squared tests tested for differences in the frequency and order of children's picture selections, whether there were any differences in selections, and between male and female participants.

The reasons given for choices made by children were transcribed verbatim for thematic analysis (19). The transcripts were read several times, patterns of meaning identified and codes applied to each section of the transcripts pertinent to the question. These codes were sorted into broader themes, which were defined and named, and examples from the transcripts chosen to illustrate them.

RESULTS

Perceived differences

When asked which character they felt was the most different from the gender-matched standard character, 29 children (34.5%) chose the fat character, 26 (31%) chose the character of the opposite gender, and 29 (34.5%) selected the character in a wheelchair. There was no statistically significant difference in the frequency of choice of the three characters ($\chi^2(2)=2.14$, $p=0.90$).

Asked how the character differed from the standard character, fatness or body shape was mentioned significantly less for the fat character than gender or being in a wheelchair was for the other drawings ($\chi^2(2)=21.83$, $p<0.005$). Only 21% of the

children who selected the fat character identified fatness as the main difference, in contrast with 65% and 79% of those identifying primary differences for the character of the opposite gender and in a wheelchair. Those choosing a reason other than fatness cited differences such as hairstyle/colour (38%), clothing (31%), and perceived differences in height (10%).

Repeating the process a further two times, Table 1 shows the most frequently identified constructs were related to the characters' clothing (29%), the use of a wheelchair (27%), hairstyle (20%), and then gender (12%). Fatness as a construct was elicited on only 19 of 245 occasions (8%) across the three choice repetitions, making it the fifth most common construct category of seven. The least frequently identified constructs related to height (3%) and 'other' characteristics (1%), for example age ("*older/younger*"). There were no differences between girls and boys in the constructs chosen.

Only 19 of the 85 children in the study (21%) identified 'fatness' as a construct in any of the three choices. This compared with 29 (34%) and 65 (76%) for 'gender' and 'in a wheelchair', respectively.

Over the 19 occasions on which fatness was elicited as a construct, only one said they would prefer a friend who was fat ("*bigger*") than one who was not ("*smaller*"). Thus a fat character was significantly less likely to be selected as the child's friend than one who was not fat ($\chi^2(1)=15.21$, $p<0.005$). Similarly, children were less likely to select a friend who was in a wheelchair (15 of 65 choices; $\chi^2(1)=56.25$, $p<0.005$) or one who was of the opposite gender (4 of 29 choices; $\chi^2(1)=19.93$, $p<0.005$).

Figure 2 summarises and groups the reasons children gave for rejecting each of the different characters as a friend. Two master themes of 'physical' and 'social' were

identified. The former was defined by features of the characters that were tangible and visible, and was made up of two subthemes, 'physical limitations' and 'burden'. While nine children commented on the physical limitations of the fat character, more made similar comments about the character in a wheelchair (N=26). The theme of 'social' encompassed subthemes that were identifiable through expected interactions with others. 'Negative character associations' were raised by a few children in relation to both the fat (N=4) and opposite gender characters (N=3). Similarly, a few of the children made reference to 'adherence to social rules' about who should be friends with whom (fat: N=4; opposite gender: N=2). None of the children discussed social reasons for rejecting the character in a wheelchair.

Comparisons to self

The majority of the children felt that they were most similar to the standard character (70%), while 13 (15%) of the participants felt that they were most like the fat character and 13 (15%) the character in a wheelchair. The children selecting the fat character were no different from the others in the researcher rating of their body size. None of the children felt they were most similar to the character of the opposite gender. When asked to whom the children felt they were most different, they most often selected the character of the opposite gender (33%), followed by the fat character (29%) and the one in a wheelchair (29%).

Asked to give a reason for these selections, only 7 children (8%) made reference to body shape or fatness. Six were in relation to being most similar to the standard character ("*thin*", "*skinny*") and the other related to the fat character ("*bit fat*"). The remaining 77 responses (92%) referred to other characteristics including wheelchair use, gender, clothing, and height.

Of the 24 children who felt they were most different to the fat character, nine (38%) expressed reasons relating to fatness (e.g. *“big belly”, “fat”*), three children were unable to provide a reason, and the remaining 13 (54%) gave a reason relating to other characteristics including hairstyle and clothing. Fatness was not referenced in the reasons for the selection of the standard, opposite sex, or wheelchair characters and therefore fatness-related reasons made up only 11% of the total responses.

In terms of the character the children most wanted to be, the majority of the children selected the standard character (68%), followed by the wheelchair (21%), fat (8%) and opposite gender (3%) characters. This order was reversed for the characters selected as least wanted to be. Participant gender was not significantly associated with the character selected as who they would most ($\chi^2(3)=2.63$, $p=0.452$) or least want to be ($\chi^2(3)=3.72$, $p=0.293$).

The reasons children gave for why they would least like to be any of the characters are grouped in Figure 3. Again, ‘physical’ and ‘social’ were identified as main themes, each with three different subthemes. Only 5 of the 24 children who selected the fat character made direct reference to their fat appearance. In terms of social reasons, three of the children referred to ‘social disapproval’ and fears that they might be teased (*“He is most fatter... some peoples will laugh at me”*) or rejected by their peers due to being fat or in a wheelchair (*“People might not want to play with you because they might want someone that isn’t in a wheelchair”*).

Children’s body size

The majority of children fell within the mid-range of the scale. Only two were rated as figure 6 and none at 7 (the largest body shape on the scale). Of these two children, one identified fatness as the most important difference between characters

and as the character they would least like to be. This child additionally gave a fatness-related construct for the repetition of the 'most different' question, expressed strong anti-fat views (e.g. "Can't play because everybody laughing at her because *she has a big tummy*"), and made assertions about the controllability of fatness on two occasions ("No people have to be fat like *her... they eat lots of things*"; "Not allowed to be fat. *You only have to have a little bit of food*"). Conversely, while the second child made reference to themselves as being most like the fat character ("*Because I'm a bit fat... you eat lots and get unhealthy and you run slow*"), they did not mention body shape or weight at any other point.

DISCUSSION

This study aimed to investigate young children's perception of fatness in the context of other visible differences. Contrary to what was hypothesized, fatness was not the feature that most distinguished characters of different body shape, gender, and physical ability. Similarly, these children were no more likely to reject the fat character as a friend or as someone they would least like to be. Instead, this rejection was most directed at being someone of the opposite gender. It was less desirable in the eyes of most 5-year old girls to be a boy than to be fat.

These findings appear to conflict with a sustained literature showing weight bias in young children (7-9,20). Two features of the present study are likely to have contributed. First, we gave children choices other than between body sizes. The study aim was not to challenge weight bias per se. There is little doubt that young children will favour lean or healthy weight characters over fat characters and they are more accepting of these as likely friends (9,21). Instead, the aim was to place

weight bias in a broader context regarding how fatness is seen in comparison with other highly visible differences.

Second, we used methodologies to help children communicate their own world views. Personal construct theory was proposed by Kelly as a first person understanding of the 'goggles' through which people see and make sense their world (15). It offers an individualist and non-judgemental perspective on a child's world and its meaning (16). Repertory grids allow access to the principal ways (constructs) that people, places or objects (elements) are seen. Inviting children to give reasons for their choice of constructs, their preferences for friends, and qualities liked and disliked, added to the conversational nature of the study.

It could be argued that children failed to see the fat characters as fat, in contrast to the more evident depiction of being in a wheelchair or as the opposite gender. This can be contested on two grounds. First, the character drawings were used in a previous study by Harrison et al (4). Using the body figure scale (17), children the same age as those in the present study rated the fat characters at between 6 and 7 on this seven figure scale (and the standard figures at between 3 and 4). Second, although in a minority, several children in the present study spoke about the social penalty and health impact of fatness. Moreover, one child expressed clear anti-fat views, confirming their perception of body size. This child was one of the two who were researcher-assessed as overtly overweight. Previous research has shown a complex relationship between weight bias and perceived and actual body size in young children (22). The comments by this child serve to remind that while negativity directed at fatness was relatively uncommon in this study, group averages can obscure large variation between individuals. A single expression of anti-fat

attitudes is not surprising but poses questions regarding the origins of their strong feelings and the influence of such 'outliers' on their peer group.

Consistent with past research on friendship choices, young children preferred a friend who was a healthy weight over one who was fat (4,8,20). Of the 19 children who offered fat as a construct describing the difference between characters, 18 preferred the construct opposite ("thin", "smaller") in a friend. However, a preference for the standard character was apparent in all of the choices. Children preferred an able-bodied friend over one with a physical disability, as previously observed (2,3,23). They also preferred a same gender friend (24). The preference for peers perceived as being categorically similar describes 'like me' tendencies, apparent in the choice of the standard character as most liked (23), and best evidenced at this age in preferences for same gender toys and playmates (25,26). Accordingly, there was no evidence that weight bias was paramount in children's choices relating to others or self.

In terms of study strengths, the methodology reduced opportunities for children's tendencies to social desirability or acquiescence and placed the child's perspective to the forefront of the research. The responses of girls and boys were compared but no clear respondent differences were observed. The narrow age range sampled could also be considered a strength given how children's views about, and experiences of, the world change with age. Often overlooked is that by age 4 most normally developing children will have acquired a knowledge of intentional states, a theory of mind (27). Young children understand what another person might be thinking or might want, that others have feelings and motivations that may be different to their own, and that this affects social interactions and their interpretation (13). Further research is required to test this method with older children as cognitive

development progresses and by including those who vary more in their own body size or weight. Clearly, there are problems regarding generalizability outside of the UK. Making inferences about children's actual social behaviour is also open to question, as these were preferences regarding drawings of characters rather than behaviour towards peers.

In conclusion, while weight bias was apparent in some of these young children, it did not dominate their world view. These findings do not deny the damage that weight stigma continues to cause. But they do challenge assumptions, especially about how early and strongly these social values are acquired and expressed. This research has practical value as children are increasingly involved in their own healthcare management (28). Service-user involvement and health literacy are important in all preventive and intervention efforts for obesity. Therefore a realistic understanding of young children's attitudes to, and knowledge about, obesity is important to this (13). The challenge remains as how to better inform children about obesity and healthy weight without fostering the negativity that is common within the popularist dialogue about obesity.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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Table 1. Frequency of reasons given (construct category) for perceived differences between the characters over the 3 comparisons

Construct Category	Comparison 1	Comparison 2	Comparison 3	Total
	N (%)	N (%)	N (%)	N (%)
Gender	17 (20%)	8 (10%)	4 (5%)	29 (12%)
Fatness	6 (7%)	7 (8%)	6 (8%)	19 (8%)
Wheelchair	23 (27%)	27 (32%)	15 (19%)	65 (27%)
Hair	16 (19%)	14 (17%)	18 (23%)	48 (20%)
Height	4 (5%)	2 (1%)	2 (3%)	8 (3%)
Clothes	17 (20%)	24 (29%)	31 (40%)	72 (29%)
Other	1 (1%)	1 (2%)	2 (3%)	4 (2%)
Total	84	83	78	245

Note that 1 child did not give a reason for comparison 1, 2 children did not give reasons for comparison 2, and 6 did not give reasons for comparison 3

Figure captions

Figure 1. The character drawings for male and female participants

Figure 2. Thematic summary of children's reasons for their rejection of the characters as a friend (opposite gender, fat, in a wheelchair)

Figure 3. Thematic summary of children's reasons for their selection of the character that they least wanted to be (opposite gender, fat, in a wheelchair)

For male participants



For female participants



Standard

Opposite gender

Wheelchair

Fat



