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Brief Report

Toddlers' bias to look at average versus obese figures relates to maternal anti-fat prejudice

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ABSTRACT

Anti-fat prejudice (weight bias, obesity stigma) is strong, prevalent, and increasing in adults and is associated with negative outcomes for those with obesity. However, it is unknown how early in life this prejudice forms and the reasons for its development. We examined whether infants and toddlers might display an anti-fat bias and, if so, whether it was influenced by maternal anti-fat attitudes through a process of social learning. Mother–child dyads ($N = 70$) split into four age groups participated in a preferential looking paradigm whereby children were presented with 10 pairs of average and obese human figures in random order, and their viewing times (preferential looking) for the figures were measured. Mothers' anti-fat prejudice and education were measured along with mothers' and fathers' body mass index (BMI) and children's television viewing time. We found that older infants ($M = 11$ months) had a bias for looking at the obese figures, whereas older toddlers ($M = 32$ months) instead preferred looking at the average-sized figures. Furthermore, older toddlers' preferential looking was correlated significantly with maternal anti-fat attitudes. Parental BMI, education, and children's television viewing time were unrelated to preferential looking. Looking times might signal a precursor to explicit fat prejudice socialized via maternal anti-fat attitudes.

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Introduction

Bias against people perceived to be obese (i.e., anti-fat prejudice, weight bias) is common in most settings, including education, health, and employment (O'Brien, Hunter, & Banks, 2007). Anti-fat prejudice appears to be increasing (Latner & Stunkard, 2003) and is associated with social isolation, depression, psychiatric symptoms, low self-esteem, and poor body image (Puhl & Latner, 2007). There is a growing literature detailing the extent and consequences of anti-fat prejudice, yet little is known about the development of this prejudice (Neumark-Sztainer et al., 1999), in particular, when anti-fat prejudice arises and why.

Some research indicates that anti-fat prejudice is present during early childhood. By 5 to 10 years of age, children state that they would rather be friends with thin as opposed to overweight individuals and that thin females would be less desirable as friends if they are pictured in the vicinity of overweight females (Penny & Haddock, 2007). Even preschoolers (M = 3.67 years) assign more negative attributes to overweight than normal-weight dolls (Turnbull, Heaslip, & McLeod, 2000). Thus, anti-fat prejudice arises early in life, although it is unknown whether there are biases against overweight and obese figures in still younger children (e.g., infants/toddlers) and, if so, how they might arise.

One explanation of an anti-fat bias is that it is communicated through maternal or paternal attitudes via a process of social learning (Puhl & Heuer, 2009). To this end, there are attributions representing obesity as a moral failing (e.g., lazy, gluttonous) and stereotypes that portray people who are fat as unattractive, smelly, and unhygienic (O'Brien et al., 2013). Although there is some consistency in individuals' prejudice toward obese individuals (e.g., in China and America; Klaczynski, 2008), there are also differences suggesting that social learning occurs. For instance, in some Pacific countries, increased weight has traditionally been associated with wealth and, therefore, has been looked on more favorably (Brewis, Wutich, Falletta-Cowden, & Rodriguez-Soto, 2011). Consistent with social learning theory, a recent meta-analysis examined a wide range of parent–child prejudices, finding that children's attitudes closely resembled those of their parents (Degner & Dalege, 2013). More directly, two studies indicate that 4-year-olds' attitudes toward obese individuals are related to parents' attitudes (Holub, Tan, & Patel, 2011; Rich et al., 2008).

Recently, Heron-Delaney, Quinn, Lee, Slater, and Pascalis (2013) showed infants pairs of pictures displaying a toned muscular body versus an overweight body, finding that 3- and 6-month-olds did not have a bias but that 9-month-olds looked longer at overweight bodies. This finding could be interpreted either as evidence of increased attention to overweight individuals due to wariness or as a preference for overweight rather than slim bodies. What is needed to provide clarity when examining research on very young children is evidence linking their looking biases to caregivers' attitudes toward obesity. A relation between such attitudes and very young children's looking biases would more clearly provide evidence for socialization theory.

Our research builds on previous research by first examining whether looking biases away from overweight bodies are present in four age groups: young infants (M = 7 months), older infants (M = 11 months), young toddlers (M = 29 months), and older toddlers (M = 32 months). Second, we examined whether maternal attitudes are related to children's looking biases. Infants have relatively impoverished language ability (Dale & Fenson, 1996), social understanding (Ruffman, 2014), and experience in the world. Whether an anti-fat attitude was expressed verbally or nonverbally through gesture or facial expression, toddlers would be more likely to understand than infants. If anti-fat attitudes are socialized, a bias against viewing overweight bodies in toddlers should be related to maternal attitudes.

We also examined a range of potentially confounding variables that might influence children's looking biases, including (a) maternal and paternal body mass index (BMI), which Heron-Delaney and colleagues (2013) hypothesized might relate to children's viewing biases (for same-sized bodies as their parents), (b) maternal education because education is a prime indicator of socioeconomic status (SES) and higher SES is associated with less favorable attitudes toward obesity (Sobal & Stunkard, 1989), and (c) children's television viewing, a known correlate of some of children's attitudes such as aggression (Huesmann, Moise-Titus, Podolski, & Eron, 2003), attitudes toward food (Dixon, Scully, Wakefield, White, & Crawford, 2007), and weight bias (Latner, Rosewall, & Simmonds, 2007).

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Method

Participants

We tested 70 mother–child dyads comprising 18 young infants (M = 6.99 months, SD = 0.74, range = 5.80–7.90; 10 girls), 19 older infants (M = 11.11 months, SD = 2.15, range = 7.93–13.40; 11 girls), 16 young toddlers (M = 28.81 months, SD = 1.28, range = 26.03–30.14; 8 girls), and 17 older toddlers (M = 32.29 months, SD = 1.16, range = 31.06–34.16; 9 girls). Mothers were contacted on the birth of their child and volunteered for participation in this study. All mothers were the primary caregiver in the family.

Measures and procedures

Children's looking biases

Fig. 1 includes representative obese and average-weight photos taken from 2 of the 10 individuals used in this study. The stimuli were "before" and "after" photos from a popular television show in which contestants try to lose weight. We used 10 pairs of figures containing one obese figure and one average-sized figure. The figures consisted of grayscale photos of complete bodies, with each figure wearing running shoes and black knee-length shorts, a T-shirt, and a large hat covering the face. Of the 20 figures, 10 were obese (5 male and 5 female) and 10 were "average," that is, similar to the BMIs in New Zealand (Ministry of Health, 2004, 2013) where this study was conducted. With regard to our 10 average body stimuli, the percentage normal weight (BMIs = 18.5–24.9) was 40%, whereas it is 27% in the New Zealand general population. The percentage overweight (BMIs = 25.0–29.9) was 50% in our average stimuli and 42% in New Zealand. The percentage obese (BMIs = 30.0–39.9) was 10% in our average stimuli and 28.5% in New Zealand (with the 1 obese body in our study in the low range of this category with a BMI of 32.8). The percentage morbidly obese (BMIs = 40.0+) was 0% in our average stimuli and 2.5% in New Zealand.

In contrast, our obese stimuli were 50% obese (all in the upper range) and 50% morbidly obese. The mean BMI of our obese stimuli (M = 43.21) was significantly higher than that of our average stimuli (M = 26.28), $t(9) = 6.27$, $p < .001$, with an average difference of 16.93. Because people are poor judges of objective weight status (Doolen, Alpert, & Miller, 2009), we also examined perceptions of the stimuli, asking 31 adults (M = 29 years, range = 19–61; 19 women) to categorize each body as "underweight," "normal or average," "overweight," or "obese." The 10 average bodies were classified as normal or average 95.2% of the time, as overweight 3.5% of the time, and as underweight 1.3% of the time. The 10 obese bodies were classified as obese 95.2% of the time and as overweight 4.8% of the time. Thus, both actual BMIs and perceptions clearly differentiated the bodies in the two categories of stimuli.

The obese and average figures were presented on two 48-cm computer monitors placed 1 m off the ground and 30 cm apart, with the obese figure presented on the left side half of the time and on the right side half of the time. The monitors were mounted on a black felt-covered wall, with black walls also on the left and right of the infant (all walls = 2 × 2 m) and a camera extending through a pinhole between the two monitors that recorded the infant's gaze. The infant's blindfolded mother sat on a chair 1.5 m from the monitors with the infant on her lap. A computer and speakers were placed behind the front black wall, hidden from the infant. The pairs of obese and average figures were preceded for 5 s by a child-friendly video image displayed on each monitor (10 child-friendly images in all) accompanied by a child's giggling, then 1 s of blank screen, and then an attention-grabbing "beep" that marked the onset of displaying the obese and average figures (for 10 s). The experimenter secretly monitored the child's eye gaze from behind the front screen and encouraged the infant to look at the monitors whenever attention wandered. In general, infants were attentive to the images, looking back and forth between each monitor. The primary coder (blind to the condition and hypotheses) coded all of the looking times, and a second individual coded 25% of the looking times, with substantial correlations between the two coders' looking times of r = .93 (looking left), r = .94 (looking right), and r = .92 (looking away) and all $ps < .001$. The primary coder's coding was used in all analyses.

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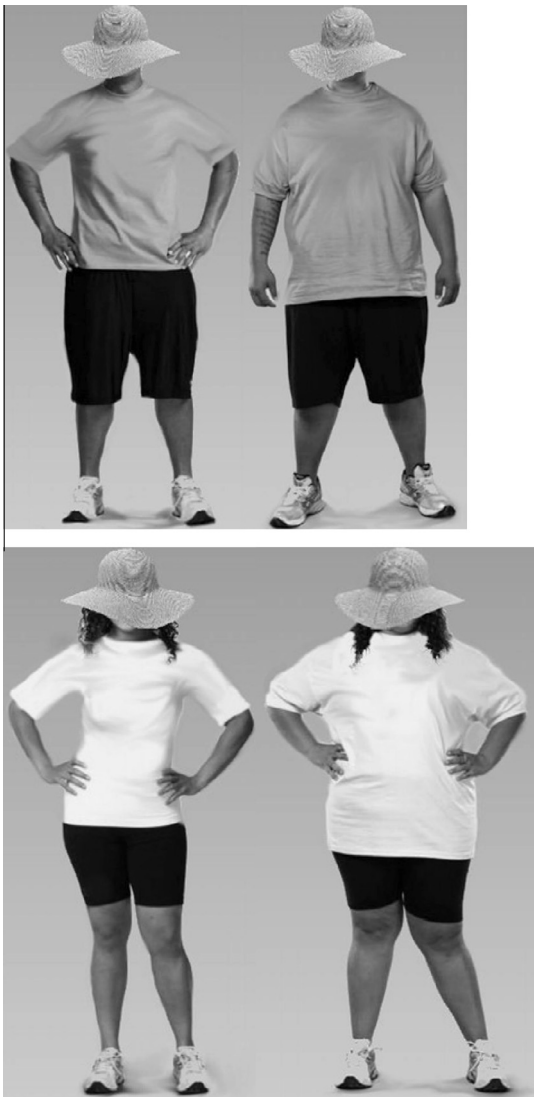

Fig. 1. Examples of items used.

Maternal anti-fat prejudice

Crandall's Anti-Fat Attitudes Questionnaire (Crandall, 1994) was used to assess explicit anti-fat prejudice. This measure is composed of three subscales: Dislike, Fear of Fat, and Willpower. The Dislike subscale assesses individuals' antipathy toward fat people (e.g., "I don't like fat people much"). The Fear of Fat subscale measures respondents' fear of becoming fat themselves (e.g., "I feel disgusted with myself when I gain weight"). The Willpower subscale assesses the belief that being overweight reflects a lack of personal control (e.g., "Fat people tend to be fat pretty much through their own fault"). Items were scored on a 10-point Likert scale (0 = *very strongly disagree*, 9 = *very strongly agree*), with higher scores indicating an anti-fat bias. All subscales had acceptable reliability—Dislike (Cronbach's $\alpha = .78$), Fear of Fat (Cronbach's $\alpha = .79$), and Willpower (Cronbach's $\alpha = .75$)—as did all items

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when examined together (Cronbach's $\alpha = .82$), and for this reason the 13-item scale was used in analyses.

Maternal education

Maternal education was categorized on a 7-point scale as follows: (1) primary school, (2) some high school, (3) high school certificate, (4) trade certificate, (5) technical certificate, (6) undergraduate degree, and (7) graduate degree.

Body mass index

Maternal heights and weights were double-measured using a stadiometer on arrival at the lab to establish BMI. Paternal BMIs were calculated on the basis of mother-reported father heights and weights.

Children's television viewing

To assess potential exposure to negative messages regarding overweight and obesity, children's daily television viewing (hours per day) was obtained via a questionnaire given to mothers.

Results

Table 1 displays the descriptive statistics for the key variables. Preliminary analyses indicated that gender was unrelated to children's looking times and that there were similar effects for girls and boys with regard to the relation between maternal anti-fat attitudes and looking times, and so gender was not examined further. Within each age group, we examined whether children's looking tendency toward average versus obese figures (looking at obese figures minus looking at average figures) was related to the number of hours of television viewing per day, maternal education, maternal or paternal BMIs, child gender, or stimulus gender. There were no significant relations (all $rs < .28$, all $ps > .14$), and so these variables were not examined further. Our subsequent analyses were designed to measure the effect of children's age group and maternal attitudes on children's looking at the obese versus average figures. We had a priori hypotheses that maternal attitudes toward body shape would be more important for toddlers than for infants.

Children's looking at obese versus average figures is displayed in Fig. 2 and was examined with a 2 (Figure Type: average vs. obese) × 4 (Age Group) analysis of variance (ANOVA). Figure type was a within-participants variable, and age group was a between-participants variable. Looking time was the dependent variable. Two effects were significant: the main effect for age group, $F(3, 66) = 36.14$, $p < .001$, $\eta_p^2 = .62$, and the interaction between age group and figure type, $F(3, 66) = 5.29$, $p = .002$, $\eta_p^2 = .19$. The effect for figure type was not significant, $F(1, 66) = 0.18$, $p = .67$, $\eta_p^2 = .00$. We examined the interaction with four t-tests employing Holm's correction to ensure that the family-wise error was maintained at $p < .05$. Young infants and young toddlers looked equally at average and obese figures, respectively, $t(17) = -0.56$, $p = .58$ and $t(15) = 0.96$, $p = .35$, respectively, whereas older infants looked longer at obese figures, $t(18) = -4.00$, $p = .001$, and older toddlers looked longer at average figures, $t(16) = 2.39$, $p = .03$.

Table 1
Mean (*SD*) performance on key measures.

	Young infants	Older infants	Young toddlers	Older toddlers
Mother's anti-fat prejudice	37.86[a] (15.76)	38.89[a] (16.29)	36.75[a] (19.52)	38.65[a] (13.82)
Mother's education	6.41[a] (0.62)	6.00[a] (1.05)	5.46[a] (1.66)	5.94[a] (1.29)
Mother's BMI	25.52[a] (5.22)	24.27[a] (3.43)	26.67[a] (5.46)	25.16[a] (6.30)
Father's BMI	26.25[a] (3.09)	26.60[a] (2.74)	25.90[a] (2.92)	26.98[a] (4.08)
Children's television viewing (hours/day)	0.15[a] (0.31)	0.16[a] (0.29)	1.22[b] (1.03)	0.94[b] (0.82)

Note. For each variable, different superscripts indicate significant difference as tested by univariate ANOVA with Bonferroni correction.

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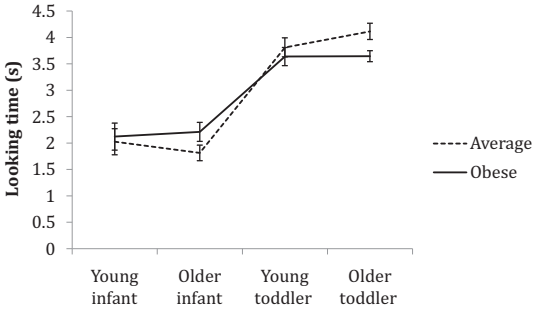

Fig. 2. Children's looking at average and obese figures (and standard errors).

To examine maternal anti-fat attitudes, we used linear regression. The dependent variable was the looking time difference score (obese minus average). Children's age and maternal anti-fat scores were the predictors in the first step, and the interaction between these two terms was entered in the second step. In the first step, age was a significant predictor of looking time, with less looking at the obese figures in older children ($\beta = -0.39$, $t = -3.57$, $p = .001$), as were maternal anti-fat scores, with less looking at obese figures in children whose mothers had higher anti-fat scores ($\beta = -0.26$, $t = -2.35$, $p = .02$). Together, the two variables accounted for 21% of the variance in children's looking times, and the model was significant overall, $F(2, 67) = 8.94$, $p < .001$. In the second step, the interaction term did not explain a significant amount of additional variance ($\Delta R^2 = .01$), $F(1, 66) = 1.14$, $p = .29$.

We hypothesized that higher maternal anti-fat attitudes would lead to a tendency to look more at average than obese figures. The only age group to look significantly more at average figures was the oldest group. For this reason, we examined the correlation between maternal anti-fat attitudes and looking time in the oldest group. As hypothesized, the correlation was significant ($r = -.62$, $p = .008$); mothers who had higher anti-fat attitudes had children with a greater tendency to look at average rather than obese figures.

Discussion

Young infants ($M = 7$ months) and young toddlers ($M = 29$ months) looked equally at average and obese figures, whereas older infants ($M = 11$ months) looked more at obese figures and older toddlers ($M = 32$ months) looked more at average figures. In addition, older toddlers' bias to look away from obese figures and toward average figures correlated significantly with maternal anti-fat attitudes and did so independent of a range of potential confounds. To recall, previous studies had found explicit anti-fat prejudice in children aged 3.67 years, whereas our results indicate that children's bias for viewing average as opposed to obese individuals develops even earlier, at least by 2.67 years of age. Furthermore, whereas previous research has established a link between the anti-fat attitudes of mothers and 4-year-olds' anti-fat bias, the current study indicates a link by 2.67 years of age.

There was a contrast between the current results and those of Heron-Delaney and colleagues (2013). In the current study older infants looked *less* at familiar average-weight figures, whereas in Heron-Delaney and colleagues' study infants looked *more* at familiar overweight figures. However, there were a number of methodological differences between the two studies. Heron-Delaney and colleagues used only male figures, whereas we used both male and female figures. Heron-Delaney and colleagues contrasted shirtless overweight individuals with toned muscular individuals, whereas we contrasted clothed obese individuals with average-weight individuals. These methodological differences could have affected the two sets of results.

A key question is how to interpret our findings. Infant looking biases have been discussed at length in the developmental literature. For instance, Courage and Howe (2001) argued that when stimuli are paired, infants initially look at a familiar stimulus when they have a weak memory trace of it by virtue

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of incomplete processing. Later, they have a novelty bias when they have a strong memory trace for a stimulus, having completed processing (see also Rose, Gottfried, Melloy-Carminar, & Bridger, 1982). In between these stages, infants might have no bias when two stimuli are equally familiar. In our study, the average-weight stimuli were close to the average body type in New Zealand and, hence, were more familiar. Nevertheless, young infants have relatively little experience in observing body types to guide their looking, which might explain their equal looking at the two body types (similar to Heron-Delaney et al.'s (2013) younger infants). In contrast, older infants, with more experience in observing body types, might recognize average bodies as familiar and, hence, look longer at relatively novel obese bodies.

Although familiarity and novelty might help to explain infant looking, they cannot, on their own, explain the looking biases of toddlers. That is, it is implausible that young toddlers' equal looking at average and obese bodies can be for the same reason—insufficient experience with different body types—as young infants. Instead, we posit that two factors affect older children's looking: (a) the novelty of a stimulus and (b) parental anti-fat attitudes. These attitudes have the strongest effect on older toddlers because they have been exposed to such attitudes for a longer time and because children's social (Ruffman, 2014) and linguistic (Dale & Fenson, 1996) understanding helps older toddlers to better understand the expression of social attitudes. Hence, young toddlers' looking shows no bias because it is influenced by both novelty (increasing looking toward obese bodies) and social attitudes (increasing looking toward average bodies), whereas older toddlers show a more clear-cut bias to look at average stimuli. The idea that older toddlers are influenced by maternal attitudes is consistent with the social learning hypothesis and with findings from broader prejudice research (Turnbull et al., 2000).

There are several unresolved issues for future research. First, we did not display individuals' faces because we were interested in children's reactions to different body types. Nevertheless, cues signaling obesity are also available in faces and could influence children's looking, a possibility that future research could examine. Second, we examined maternal anti-fat attitudes because mothers were the primary caregivers. However, it is likely that paternal attitudes are also important, as are broader societal influences, although perhaps mainly for older children. Third, although there are some cultural consistencies in responses to obesity, a fuller figure is looked on more favorably in some cultures (see above). The social learning hypothesis predicts that children's attitudes in these cultures would relate to parental attitudes, such that children would prefer larger body size.

In sum, the current study indicates that children's looking bias for certain body types changes between 7 and 32 months of age, with older children's looking away from obese bodies and toward average bodies being related to maternal anti-fat attitudes. Our results provide a potential mechanism for the development of prejudice in children.

References

Brewis, A., Wutich, A., Falletta-Cowden, A., & Rodriguez-Soto, I. (2011). Body normal and fat stigma in global perspective. *Current Anthropology, 52*, 269–276.

Courage, M. L., & Howe, M. L. (2001). Long-term retention in 3.5-month-old infants: Familiarization time and individual differences in attentional style. *Journal of Experimental Child Psychology, 79*, 271–293.

Crandall, C. S. (1994). Prejudice against fat people: Ideology and self-interest. *Journal of Personality and Social Psychology, 66*, 882–894.

Dale, P. S., & Fenson, L. (1996). Lexical development norms for young children. *Behavior Research Methods, Instruments, & Computers, 28*, 125–127.

Degner, J., & Dalege, J. (2013). The apple does not fall far from the tree, or does it? A meta-analysis of parent–child similarity in intergroup attitudes. *Psychological Bulletin, 139*, 1270–1304.

Dixon, H. G., Scully, M. L., Wakefield, M. A., White, V. M., & Crawford, D. A. (2007). The effects of television advertisements for junk food versus nutritious food on children's food attitudes and preferences. *Social Science and Medicine, 65*, 1311–1323.

Doolen, J., Alpert, P. T., & Miller, S. K. (2009). Parental disconnect between perceived and actual weight status of children: A metasynthesis of the current research. *Journal of the American Academy of Nurse Practitioners, 21*, 160–166.

Heron-Delaney, M., Quinn, P. C., Lee, K., Slater, A. M., & Pascalis, O. (2013). Nine-month-old infants prefer unattractive bodies over attractive bodies. *Journal of Experimental Child Psychology, 115*, 30–41.

Holub, S. C., Tan, C., & Patel, S. L. (2011). Factors associated with mothers' obesity stigma and young children's weight stereotypes. *Journal of Applied Developmental Psychology, 32*, 118–126.

Huesmann, L. R., Moise-Titus, J., Podolski, C.-L., & Eron, L. D. (2003). Longitudinal relations between children's exposure to TV violence and their aggressive and violent behavior in young adulthood: 1977–1992. *Developmental Psychology, 39*, 201–221.

Please cite this article in press as: Ruffman, T., et al. Toddlers' bias to look at average versus obese figures relates to maternal anti-fat prejudice. *Journal of Experimental Child Psychology* (2015), http://dx.doi.org/10.1016/j.jecp.2015.10.008

Klaczynski, P. A. (2008). There's something about obesity: Culture, contagion, rationality, and children's responses to drinks "created" by obese children. *Journal of Experimental Child Psychology, 99*, 58–74.

Latner, J. D., Rosewall, J., & Simmonds, M. B. (2007). Childhood obesity stigma: Association with television, videogame, and magazine exposure. *Body Image, 4*, 147–155.

Latner, J. D., & Stunkard, A. J. (2003). Getting worse: The stigmatization of obese children. *Obesity Research, 11*, 452–456.

Ministry of Health. (2004). *Tracking the obesity epidemic: New Zealand 1977–2003*. Wellington, New Zealand: Ministry of Health. Available at: <http://www.health.govt.nz/system/files/documents/publications/trackingtheobesityepidemic.pdf>.

Ministry of Health. (2013). *New Zealand health survey: Annual update of key findings 2012/13*. Wellington, New Zealand: Ministry of Health. Available at: <https://www.health.govt.nz/publication/new-zealand-health-survey-annual-update-key-findings-2012-13>.

Neumark-Sztainer, D., Story, M., & Harris, T. (1999). Beliefs and attitudes among teachers and school health care providers working with adolescents. *Journal of Nutrition Education, 31*, 3–9. http://dx.doi.org/10.1016/S0022-3182(99)70378-X.

O'Brien, K. S., Daníelsdóttir, S., Ólafsson, R. P., Hansdóttir, I., Fridjónsdóttir, T. G., & Jónsdóttir, H. (2013). The relationship between physical appearance concerns, disgust, and anti-fat prejudice. *Body Image, 10*, 619–623.

O'Brien, K. S., Hunter, J. A., & Banks, M. (2007). Implicit anti-fat bias in physical educators: Physical attributes, ideology, and socialization. *International Journal of Obesity, 31*, 308–314.

Penny, H., & Haddock, G. (2007). Anti-fat prejudice among children: The "mere proximity" effect in 5–10-year-olds. *Journal of Experimental Social Psychology, 43*, 678–683.

Puhl, R. M., & Heuer, C. A. (2009). The stigma of obesity: A review and update. *Obesity, 17*, 941–964.

Puhl, R. M., & Latner, J. D. (2007). Stigma, obesity, and the health of the nation's children. *Psychological Bulletin, 133*, 557–580.

Rich, S. S., Essery, E. V., Sanborn, C. F., DiMarco, N. M., Morales, L. K., & LeClere, S. M. (2008). Predictors of body size stigmatization in Hispanic preschool children. *Obesity, 16*(Suppl. 2), S11–S17.

Rose, S. A., Gottfried, A. W., Melloy-Carminar, P., & Bridger, W. H. (1982). Familiarity and novelty preferences in infant recognition memory: Implications for information processing. *Developmental Psychology, 18*, 704–713.

Ruffman, T. (2014). To belief or not belief: Children's theory of mind. *Developmental Review, 34*, 265–293.

Sobal, J., & Stunkard, A. J. (1989). Socioeconomic status and obesity: A review of the literature. *Psychological Bulletin, 105*, 260–275.

Turnbull, J. D., Heaslip, S., & McLeod, H. A. (2000). Pre-school children's attitudes to fat and normal male and female stimulus figures. *International Journal of Obesity, 24*, 1705–1706.

Please cite this article in press as: Ruffman, T., et al. Toddlers' bias to look at average versus obese figures relates to maternal anti-fat prejudice. *Journal of Experimental Child Psychology* (2015), http://dx.doi.org/10.1016/j.jecp.2015.10.008