Application of Children's Figural Scale to Compare Actual, Perceived, and Desired Self Images

Karla Teel, Pamela Ulrich, and Ali Zaremba Morgan, Auburn University, USA

Keywords: Figural scale, body image, tweens, avatars

Child and adolescent obesity in the US and abroad is a significant health problem (Hruby & Hu, 2014). Contributors are most likely environmental and psychosocial (Costa-Font & Gil, 2013; Harrist et al., 2012). Recent studies showed that half of the parents of overweight or obese children perceived them to be normal weight (Lundahl, Kidwell, & Nelson, 2014). Evidence of children's and adolescents' accuracy in self-perceiving their size is limited, in part because figural scales typically used to measure body image perception were conceptual line drawings rather than measurable bodies. These scales have been used to assess body dissatisfaction (difference between the figure perceived as self and the one seen as ideal) more than self-perception accuracy. Research suggests that overweight and obese girls and boys are more dissatisfied than their normal weight counterparts (Ulrich, Connell, & Simmons, 2007; Sancheti, 2009; Truby & Paxton, 2002). The precision of measuring body dissatisfaction with a figural scale hinges on whether or not the subject picks a "me" body image that represents reality. One study found that large size 9-14 year old girls did not pick comparably large size images (Mahajan, 2009). Pubertal timing may affect body image (Williams & Currie, 2000).

Children's Figural Scales (CFS) (Simmons & Ulrich, 2014) for girls and boys were developed as a new research tool to measure accuracy of body size and shape self-perception, and body satisfaction in terms of size and shape (conceived as representing pubertal changes – e.g., bust development for girls and upper body/shoulder muscularity for boys). Three rows of five avatar images each, all derived from the 3D body scans of 9-14 year olds, were arrayed from low to high BMI (across, left to right) and from pre-pubertal to pubertal change (top to bottom columns). BMIs were documented for each avatar. The research objective was to investigate self-perception accuracy of pre- and early pubertal children's body image and possible differences between actual, perceived, and desired physical selves. A convenience sample of 139 girls and 114 boys (all aged 9-14) participated (accompanied by parents) in data collection where each was body scanned, had height and weight measured (to calculate actual BMI), and picked both a Perceived Self and Desired Self figure on the printed CFS (Simmons & Ulrich, 2014).

Using BMI and age values, analyses of variances were conducted for sex and age differences for Actual Self (participant's BMI or age), Perceived Self (BMI or age of avatar chosen as self) and Desired Self (BMI or age of avatar selected). As expected due to normal growth, there were significant differences in Actual BMIs by age (F=8.75, p=.00) and in Perceived BMIs by age (F=2.90, p=.01). Desired Self also differed significantly by age (F=4.33, p=.00) and sex (F=117.53, p=.00). Regardless of age, girls on average had lower Perceived and Desired Self-BMI values than boys with similar Actual BMI values. For all participants, significant age differences (F=6.49, p=.00) in Perceived Self-BMI choices suggested that they were good reporters of their own age/pubertal development. Self-perception of BMI category was evaluated by denoting as 0=underweight, 1=normal, 2=overweight, and 3=obese. Boys and

girls differed significantly (F=14.30, p=.00) in their Perceived Self-BMI category (i.e. category of Perceived Self avatar); on average, boys perceived larger BMI categories than girls. They also differed significantly (F=80.27, p=.00) in Desired Self-BMI category (i.e. category of Desired Self avatar); girls desired a lower category than boys.

To further explore Actual, Perceived, and Desired Selves, difference scores were generated for T-tests to determine if they differed significantly from zero and were higher or lower. For body size (CFS rows), these were: Perceived minus Actual Self-BMIs, Desired minus Actual Self-BMIs, and Desired minus Perceived Self-BMIs. For age/pubertal change (CFS columns), the same differences were calculated except for Age. On average, children's Perceived and Desired Self-BMIs were significantly lower than their Actual Self-BMIs (t=-2.80, p=.01, and t=-3.18, p=.00 respectively). Their Perceived and Desired Self-Ages were significantly younger than their Actual Self-Ages (t=-10.28, p=.00, and t=-9.14, p=.00 respectively). The moderately positive difference between Perceived and Desired Self-Ages (t=1.88, p=.06) suggested that they wanted to look slightly older than they perceived they did.

The research confirmed the potential value of the two-dimensional CFS. Some results were mixed. ANOVA values suggested that the children were relatively accurate in perceiving their pubertal development, but difference scores showed that they saw themselves as younger or less developed. As in previous studies (Sancheti, 2009), girls wanted to be smaller; they also perceived themselves as smaller than they were, differing from the boys. Approximately 25% were overweight or obese, but few of them picked the largest figures as Perceived Self. Further exploration of their body measurements and choices in relation to the avatars may be insightful.

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