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# Adolescent Boys' Reactions to Using Avatars to Represent Their Bodies<sup>1,2</sup>

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Received 28 June 2015; revised 5 November 2015; accepted 7 November 2015

## Key words:

Attitudes;  
Adolescents;  
Male;  
Perceptions;  
Instrument;  
Feasibility

**Introduction:** The purpose of this study was to provide a detailed description of completing the Attitudes and Avatars Instrument in the classroom and explore the feasibility and acceptability of the instrument.

**Methods:** The descriptive study included three written open-ended questions for data collection to which young adolescent boys responded after completing the Attitudes and Avatars Instrument.

**Results:** Fifty-nine boys between 11 and 14 years of age completed the instrument in the time allotted and had an overall positive reaction.

**Conclusion:** As the Attitudes and Avatars Instrument continues to develop as a screening instrument, it is imperative to obtain feedback from boys of diverse races and ethnicities.

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Overweight and obesity continue to be a challenge among adolescents, specifically adolescent boys. From 2009 to 2010 the prevalence of obesity was higher among adolescents (18.4% ages 12–19, 18.0% ages 6–11) than preschool-aged children (12.1% ages 2–5) and higher among boys (18.6%) than girls (15%; Ogden, Carroll, Kit, & Flegal, 2014). In addition, physical activity and healthy eating decline throughout childhood, increasing the risk of obesity during adolescence (Driskell, Dymont, Mauriello, Castle, & Sherman, 2008; Pate et al., 2002). One of the chief barriers to effective treatment of weight issues in adolescence is that many teens do not perceive that they are overweight (Barlow & Expert Committee, 2007). Lu et al. (2015) analyzed the National Nutrition Examination Survey (NHANES) and found that the percentage of obese adolescent boys who accurately perceived their weight status significantly de-

clined from 80% (NHANES III, 1988–1994) to 58% (Continuous 3 cycles of NHANES, 2007–2008, 2009–2010, 2011–2012). Misperception of weight status may diminish healthy lifestyle behaviors, while overweight or obese adolescents who recognize themselves as overweight are more likely to adopt healthy lifestyle behaviors, such as healthy eating and regular physical activity (Maximova et al., 2008) and engage more intensely in positive behavior change (Bittner Fagan, Diamond, Myers, & Gill, 2008). Although obesity in adolescence has become more widely recognized as an important concern for health care providers and researchers alike, little work has been done to develop state-of-the-art instruments to measure adolescent body perception.

Whitlock, O'Conner, Williams, and Lutz (2010) recommended that health care providers not only measure weight status but also assess how adolescents perceive their own bodies to screen and refer them appropriately. Despite the availability of technology to automatically and systematically calculate body mass index (BMI), the most commonly reported method used by providers for screening excess weight is visual inspection (Barlow & Expert Committee, 2007; Dorsey, Wells, Krumholz, & Concato, 2005; Perrin, Flower, & Ammerman, 2004). Clinicians used the electronic health record to accurately document BMI during 3% of the

<sup>1</sup> Funding: This research study was possible because of funding received from an NIH NRSA Individual Fellowship, grant number: 1F31NR012877-01A1 and University of Wisconsin-Madison School of Nursing Florence Blake and Eckburg Research Funds.

<sup>2</sup> Conflicts of interest: None to report.

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visits, BMI percentile during 4% of the visits, and weight category during 12% of the visits (Shaikh, Nelson, Tancredi, & Byrd, 2010). In addition, the clinicians counseled their clients on nutrition, physical activity, and sedentary activity in 20 to 25% of all the visits (Anis et al., 2004). Although weight and height are routinely measured vital signs, the calculation of body composition and assessment of body perception, health risk, and related behaviors are not routinely done (Dunn et al., 1999; Eden, Orleans, Mulrow, Pender, & Teutsch, 2002).

Beyond the clinical setting, in research studies, investigators commonly use figure drawings and questionnaires to examine body image and attitudes in adolescents (Cohane & Pope, 2001). Figure drawings include sets of nine male and/or female silhouettes, ranging from extremely thin to extremely fat, usually adapted from Stunkard, Sorenson, and Schulzinger (1983). These drawings are uni-dimensional with the whole body increasing in size, versus variation in individual body parts increasing. As a result of the whole body changing in size, adolescents may select images that do not reflect the perceptions of their bodies. There is a need to augment existing instruments with one that is multidimensional, computerized, and can be manipulated by adolescents to depict their perceptions of their bodies and body parts.

Given the lack of available measures and the gap that existed, researchers developed the ATTitudes and Avatars INSTRument (ATTAIN), an online, multidimensional instrument guided by the integrated behavior model (IBM; Montano & Kasprzyk, 2008). The IBM proposes that an important determinant of behavior is intention to perform the behavior. A person is likely to carry out a behavior with motivation as determined by three constructs: attitude, perceived norm, and personal agency. The focus of this instrument is the construct of attitude, which is a person's overall favorableness or unfavorableness toward performing the behavior. An important innovation of this tool is the inclusion of satisfaction or dissatisfaction and accuracy of perceptions of the body and size of body parts when defining attitude.

The ATTAIN includes 20 survey items to measure boys' perceptions of their bodies, body parts, weight, and intentions to make changes to their bodies. The avatars were developed so the adolescent boys could create current and preferred representations of their bodies (Lyles, Riesch, & Brown, 2015). The purpose of this study was to provide a detailed description of adolescent boys ages 11 to 14 completing the ATTAIN in the classroom and explore feasibility and acceptability of the instrument.

## Methods

### Design and Sample

The descriptive study included three written open-ended questions for data collection to which young adolescent boys (11 to 14 years) responded after completing the ATTAIN application. The boys were recruited if they met the following criteria: (a) male gender; (b) between ages of 11 and 14; (c) able to speak, read, and write English; (d) had parents/guardians who were able to read and write English to provide consent; and (e) free from cognitive disabilities that

would limit understanding of the ATTAIN (assessed by school physical education teachers).

Upon approval from the University's Institutional Review Board, the recruitment plan consisted of meeting with the school personnel to discuss recruitment strategies. Based on recommendations from the school personnel, the research team introduced the study during the physical education (PE) classes at a middle school in a small city in the Midwest.

### Procedure

The ATTAIN had two components. The first component consisted of 23 survey items based on the IBM (Montano & Kasprzyk, 2008). The second component consisted of an online application that enabled the boys to design avatars to portray their current body shapes and their preferred body shapes. The development of the instrument from inception to final product evolved over 16 months of collaboration between a creative director and the research team. The research team consisted of the principal investigator, the co-investigator, and four undergraduate nursing students. The research team, statistician, director of Information Technology (IT) at the University, and creative director met at least monthly and more frequently as needed to review and discuss the vision and necessary parts to be included in the ATTAIN. Using an iterative process, the principal investigator made several revisions to the ATTAIN after receiving feedback from the research group, six health experts, and six adolescent boys (Lyles et al., 2015).

The research team also met for measurement training. Each research assistant was trained to measure body parts using the procedure recommended by the American College of Sports Medicine (Tucker, 2011). During training, the research team members measured the body parts of the same people to verify similar measurements, plus or minus two centimeters. Once the research team established interrater reliability in the research lab, the team members used the measurement procedure with the boys.

Prior to data collection, the research team first met with the school personnel including the principal, middle school IT staff, PE teachers, and the school nurse to discuss how and when the information would be presented to the boys during PE classes. The investigator demonstrated the ATTAIN application to the school personnel and addressed any concerns. The research team then introduced the study to the boys during the physical education classes. They sent a packet with information about the study home with the adolescent boys to discuss the study with their parents. The boys and parents returned the signed assent and consent forms to their physical education teachers.

On the day of data collection, the boys who assented to be in the study were excused from PE class to the school library to complete the ATTAIN application. Each boy sat at a laptop where the application was preloaded. The research team divided the boys with half getting their measurements taken and the other half monitored while completing the

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