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SPECIAL SECTION: DIVERSITY AND INCLUSION

Effects of Gender and Body Weight on Children's Peer Choice During Physical Activities

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Abstract

The present study investigated possible effects of gender and body weight on children's peer choices during physical activities. Twenty-four school-aged children (12 overweight and 12 non-overweight) were observed during 2 play sessions: the 1st session consisted of 2 tests that required agility (A) and 1 that required strength (S) in an A-S-A design; the 2nd session consisted of 2 strength tests and 1 agility in an S-A-S design. Before each session, 2 participants were asked to choose members for their teams. Results suggest that peer gender is a stronger predictor of children's playmate choices than their body weight. More specifically, children preferred to choose a peer of the same gender who was overweight rather than a peer of the opposite gender who was not overweight. However, when there was a choice between an overweight peer and a non-overweight peer of the same gender, the non-overweight child was favored.

Keywords Gender · Body weight · School-aged children · Peer acceptance · Physical activities

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The developmental literature has ample evidence that children dedicate much of their time to group play activities, which are essential to their developing social skills (e.g., Carvalho, Branco, Pedrosa, & Gil, 2002; Pellegrini, 2011; Singer, Golinkoff, & Hirsh-Pasek, 2006; Smith, 2009). Exercise play (e.g., running, hopping, climbing), for example, represents up to 20% of children's social playtime (Lillard, 2015). Children learn much from their peers during playtime about how to behave socially, but children's choices of playmates may be under the control of different features of the environment or of the playmates themselves (e.g., their attractiveness level, gender, body type, popularity, skills).

In natural settings, children's preferences for playmates of the same gender have been shown in the literature (cf. Hines, 2015; Rose & Smith, 2009; Rubin, Bukowski, & Parker, 2006), and segregation on the basis of gender persists throughout childhood (Mehta & Strough, 2009). In fact, children spend less time playing with other-gender peers than with same-gender ones (Fabes, 1994; Lee, Howes, & Chamberlain, 2007; Maccoby & Jacklin, 1987; Richards, Crowe, Larson, & Swarr, 1998). In addition, previous research has shown that overweight children experience segregation (e.g., Eisenberg, Neumark-Sztainer, & Story, 2003) and teasing during play activities (Hayden-Wade et al., 2005). Importantly, the behavioral impact of bias against overweight children can be observed when they are excluded from team sports, when they are not invited to birthday parties or other

Research Highlights

- Although children's preferences for playmates of the same gender have been repeatedly evidenced in the literature, it is not clear what role body weight plays in playmate preference.
- We investigated possible effects of gender and body weight on children's peer choices during physical activities.
- We found that children tended to prefer a playmate of the same gender who was overweight rather than one of the opposite gender who was not overweight, but when there was a choice between an overweight peer and a non-overweight peer of the same gender, the non-overweight child was favored.

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social events, when they are not encouraged to participate in different social interactions, or, worse, when they are punished for doing so (e.g., Faith, Leone, Ayers, Heo, & Pietrobelli, 2002).

The effects of segregation on the basis of weight are long lasting and seem to expand to different areas of adult life. Over 40% of adults with a body mass index (BMI) of 35 or higher report weight discrimination, and women with a BMI of 30–35 are three times more likely to suffer from discrimination than adult men within the same BMI range (Puhl, Andreyeva, & Brownell, 2008). Moreover, weight discrimination has clear negative consequences, such as low self-esteem (French, Story, and Perry, 1995; Simões & Meneses, 2007), and may lead to both internalizing (e.g., depression) and externalizing problems (e.g., impulsivity), as well as uncontrolled eating (Luiz, Gorayeb, & Liberatore, 2010; Madowitz, Knatz, Maginot, Crow, & Boutelle, 2012; Puder & Munsch, 2010).

As overweight children are at risk for becoming victims of discrimination (Yen, Liu, Ko, Wu, & Cheng, 2014) and, consequently, for physical, psychological, and social problems (Falkner et al., 2001), more studies investigating their participation in school physical activities are needed. Recent behavioral research has helped to advance our current understanding of implicit attitudes regarding gender and body weight. For example, in a recent study, Nolan, Murphy, and Barnes-Holmes (2013) used the Implicit Relational Assessment Procedure (IRAP) to measure body-weight bias in a sample of college students and found significant gender effects regarding both the participant gender and the gender of the target stimuli used in the assessment. The IRAP, in short, consists of the presentation of one label stimulus, one target, and two relational terms that may be consistent or inconsistent with participants' learning histories. For example, participants saw the label stimulus "clever" at the top of the computer screen and the photograph of a slim person (visual target stimulus) below it. They were then asked to choose one of two possible response options, displayed at the bottom-left and bottom-right corners of the screen: "similar" at the left corner (e.g., pressing the "D" key on the keyboard) or "opposite" at the right corner (pressing the "K" key). Latency of responses is measured in each case, and it is expected that participants will show longer response latencies in the inconsistent trials than in the consistent trials. First, the male participants showed more implicit body-weight bias than the female group did. Second, participants showed more implicit antifat bias when the target stimulus was male in contrast to trials when the target was female.

Another recent study has successfully used IRAP to assess children's gender-implicit attitudes toward toys (Rabelo, Bortolotti, & Souza, 2014). In this study, school-aged children were presented with a name (John or Mary) paired with the picture of a gender-stereotypic toy (a toy car or a doll) on a computer screen. Children were asked to press a green key if they thought the toy matched the name and a red key to indicate that the toy and the name did not match. Participants responded faster to pairings that were consistent with gender stereotypes (e.g., Mary and dolls match, whereas John and dolls do not match). Interestingly, latencies were shorter for pairings of girls and toy cars than for pairings of dolls and boys. These findings demonstrate the potential contributions of using IRAP to assess implicit attitudes; however, we still know little about when and how these types of relational responding emerge.

The present study investigated whether children display preferences based on gender or body weight during peer selection for physical activities requiring agility and strength. More specifically, the present study explored the relative value that children attribute to a peer's gender and weight during peer selection for these activities. One possible outcome is that children may prefer a partner who is not overweight, regardless of his or her gender. Another possible outcome is that the gender of the teammate plays a more important role in children's decisions about whom they want to play with.

Method

Participants

Eighty-nine elementary school children (46 boys and 43 girls) were initially recruited from a public school in the state of São Paulo, Brazil, from families with low socioeconomic status. Ages ranged from 6 to 9 years. Ethics approval was obtained from our institutional research ethics board. At each school, the research project was first presented to the directors and teachers for approval. After receiving their authorization to conduct the research project, parents received consent forms and our contact information, in case they had any questions about the study. Only children who presented consent forms signed by their parents and who provided assent participated. The goal was to have two groups with an equal number of participants: one group of overweight children and one group of non-overweight children (with an equal number of boys and girls in each). Additionally, we assessed popularity ratings or sociometric status to control for possible bias toward children who were popular. For example, children who were very popular in school could be selected first not because of their body weight or gender but because everybody liked them.

Participant Characterization

Newen-Goldstein Index Each child's height, gender, age (year and months), and expected weight for his or her respective age group and gender were registered. Children were assessed individually (height and weight), and they were informed that their information would remain confidential—that is, only the

researchers responsible for the project would have access to that information. The expected weight and height for any age group is the 50th percentile for age. The data was then entered to calculate the index (Damiani, Carvalho, & Oliveira, 2000): Obesity Index- OI (Newen-Goldstein) = [(current weight/current height) / (expected weight/height)] × 100. Children with a score of 120 or greater were in the overweight/obese range.

Sociometric Status An adapted version of the procedure used by Coie, Dodge, and Coppotelli (1982) was used to assess children's sociometric status as a measure of popularity within the classroom. Each participant was first individually interviewed by the experimenter in a quiet room, located in the same school. Four questions were asked: (a) Can you name the three classmates you most like to play with? (b) Can you name the three classmates you most like to study with? (c) Can you name the three classmates you least like to play with? (d) Can you name the three classmates you least like to study with? After computing all answers, we were able to assess the number of times each child was nominated as first, second, and third choice in the four categories: (a) favorite playmate, (b) favorite study mate, (c) least favorite playmate, and (d) least favorite study mate.

Based on the results obtained from both measures, the final sample consisted of 24 participants: 12 overweight (5 boys and 7 girls) and 12 non-overweight (7 boys and 5 girls; *M* age = 7.1 years, *SD* = 4.24 months). Only 3 out of the remaining 65 children were overweight, but they did not meet inclusion criteria. As our goal was to have the same number of overweight and non-overweight children, the other 62 children were excluded from the study.

Materials and Setting

During physical activities, the following materials were used: 1 whistle; 16 pieces of cut fabric (used to identify the different teams); 1 ballot; 1 ball made of soft, synthetic material; newspapers and tape (used to make paper balls); and 2 carton boxes wrapped in gold and blue paper (baskets). During the activities requiring strength, one 4-m rope, one handkerchief, and colored tape were used. The study was conducted in the school gymnasium.

Procedures

Data Collection Two experimental sessions were conducted. During the first session, children participated in two activities requiring agility (A) and one requiring strength (S) in an A-S-A design. During the second session, two activities requiring strength (S) and one agility (A) were conducted, in an S-A-S design.

Before each play session, two children, randomly selected from the non-overweight group, were asked to pick their teams alternatively. Each team had thus 12 children (a leader and 11 children). As each experimental session consisted of three tests, there were six opportunities to choose team members. Each pair of leaders had the task of forming the teams twice (once in each session): before one agility and one strength activity. For example, during the first experimental session, the first pair of leaders formed a team for an agility test, and during the second session, the same pair of leaders formed a team for a strength test. Therefore, 6 of the 24 children in the sample had the role of leader twice, and the remaining 18 participated only as team members, who were picked in the order suggested by the leader. The goal was to test whether the preference pattern would change depending on the skill being tested or required.

Agility activities required skills such as dexterity and speed from participants. Three games were chosen to represent this category: running with a ball, ball war, and *queimada*. Children were given the instructions/rules for each game, and the leaders of each team were nominated.

During the running-with-the-ball game, children had to carry 16 balls and place them in the baskets, which were at a distance of 2 m. The winning team was the first one to carry all the balls to the baskets. During the ball war game, children were divided into two fields and instructed to catch all the balls in their field and throw them to the other team for approximately 10 min. The winning team was the one with the least number of balls. Last, *queimada* is a game where two teams play against each other and each team has its own field. The player who is holding the ball has to throw it at one opponent (without ever crossing the field border) with the goal of hitting the opponent and making him or her drop the ball to the floor. If the player is successful, the child from the other team is "burnt" and has to leave the court. The winning team is the one able to "burn" all the members from the opposing team first.

The strength activities required skills such as physical strength and resistance. The three games chosen were as follows: little baby, little chair, and tug-of-war. During the little baby game, one child had to carry all the other team members to the finish line. The winning team was the first one to accomplish the task. The little chair game was similar, except that two children had to use their arms (as if pretending to be a chair) to carry a team member to the finish line. The winning team was the first one to take all other team members to the finish line. The main goal of the tug-of-war game was to have two teams at opposite ends of a long rope. Each team pulled the rope with the hope of dragging the other team across the line. The winning team was thus either able to make the other team cross the line or able to make a member of the other team fall or sit down. It is important to note that these activities were routinely part of their physical education (PE) classes. None of the recruited participants presented health conditions that prevented them from participating in the PE classes.

Finally, the cooperation and collaboration activity required skills such as the willingness to help each other. The main goal of this third type of activity was to reinforce empathic behaviors and to show the importance of each and every member of the group, independently of his or her physical characteristics. The game chosen to represent this category is called "alert." During the game, all children first gave hands and made a circle. Next, the experimenters taught them some novel vocal commands like "plaft," "tralálá," "zum," and "click" and the movements associated with each command. One child would start the game by giving a command and making the movement simultaneously and then turning to the child on his/her left or right and this child then had to repeat the same command and movement. Next, this second child would turn to the next person in the circle, who would have to repeat the same combination, until everyone in the circle repeated the combination of command/movement correctly. If someone made a mistake, they would have to start over again until everybody in the circle was able to reproduce all commands and movements.

Data Analysis Data analyses focused on the leaders' top choices of peers for their teams before each activity (agility or strength), as well as their bottom choices (last three playmates selected). First, an analysis of the relative frequency distribution of the first three choices made by female and male leaders was conducted, with activities collapsed. More specifically, we were interested in the number of times an overweight boy, an overweight girl, a non-overweight boy, and a non-overweight girl were chosen by each leader as one of their three top choices, regardless of whether the activity required strength or agility. Next, the same analysis was conducted for the frequency distribution of the last three choices made by female and male leaders. Chi-squared analyses were also conducted to test possible associations between the variables of interest.

Results

A chi-squared test revealed an association between the leader's gender and peers' gender (top three choices), $\chi^2(1) = 16.20$, $p < 0.001$; more specifically, boys chose boys more frequently as their top three choices for teammates, whereas girls chose girls more frequently. No association was found between the leader's gender and peers' weight status (p = not significant); in other words, female and male leaders did not differ in how frequently they chose an overweight peer as one of their top choices.

For both male and female leaders, the preferable choice of peer was someone of the same gender who was not overweight: 61.1% of the top three choices made by male leaders were for a non-overweight boy, and 50% of choices of female leaders were for a non-overweight girl. The second-favored peer of both male and female leaders was someone of the same gender and overweight (27.77% of their top three choices). Girls (overweight and non-overweight) represented only 5.55% of male leaders' top choices, whereas 16.66% of choices made by female leaders were for a non-overweight boy and 5.55% for an overweight boy (see Figure 1).

Second, an analysis of the relative frequency distribution of the bottom three choices made by both male and female leaders was conducted (see Figure 2). Again, chi-squared analyses revealed an association between the leader's gender and peers' gender (top three choices), $\chi^2(1) = 5.6$, $p = 0.018$, but not between the leader's gender and peers' weight status (p = not significant). As can be seen in Figure 2, male leaders rejected more frequently non-overweight girls (44.44% of their last three choices) and overweight girls (33.3%), whereas female leaders rejected more frequently non-overweight boys (50%), followed by non-overweight girls (27.7%).

Chi-squared analyses were also conducted to test for a possible association between the following variables: type of activity (strength and agility) and peers' gender (top three choices), as well as type of activity and peers' weight status. No association was found (ps = not significant). In other words, leaders' preferences for teammates were not related to the type of ability required for the activity. As can be seen in Figure 3, non-overweight boys were the top choice for both strength and agility tasks (38.88%). Overweight girls were the least favored by leaders for the strength tasks (11.11%), and overweight boys were the least favored for the agility tasks (11.11%).

Discussion

Our results suggest that children take into consideration a peer's body weight when making decisions about whom to include in their teams. Both male and female leaders (n = 6) infrequently selected an overweight peer as one of their first three choices for team members. However, gender proved to influence children`s choices even more. Many participants in the present study would rather pick someone of the same gender who was overweight than pick someone of the opposite gender who was not overweight. However, when given a choice between a friend of the same gender who was overweight and one who was not, the non-overweight child was favored. In conclusion, these results suggest that these two variables, gender and body weight, play an important role in determining children's playmate choices during physical activities.

One important limitation of the present study, however, was the small number of participants (n = 24); although we had a potentially large sample before data collection started (n = 89), it was important to guarantee our controls, such as selecting participants who did not fit in the "popular" or

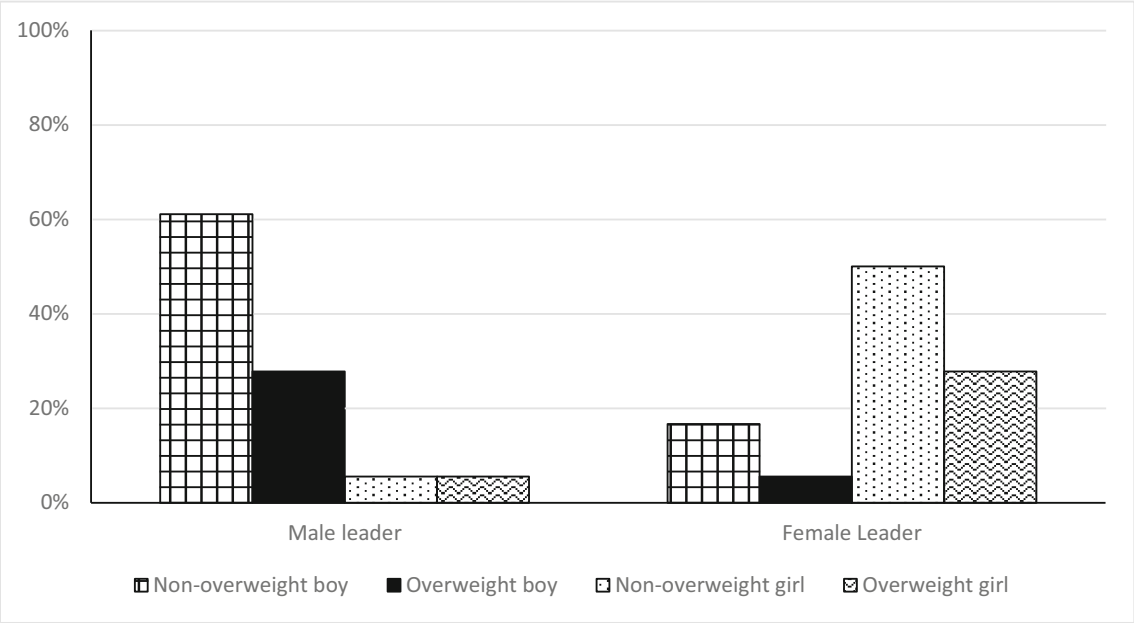

Fig. 1 Relative frequency distribution of first three choices made by male and female leaders

"rejected" categories, according to results from a sociometric status measure. Future studies should combine similar controls and a measure of implicit attitudes, in larger samples, in order to investigate further the effects of gender and body weight on children's playmate preferences.

A second limitation was that we only controlled for selection of overweight friends (i.e., children who nominated an overweight peer as their favorite playmate or study mate) but not for selection of non-overweight friends. Therefore, it is possible that some children chose a non-overweight peer in one of the games based exclusively on friendship and familiarity rather than on physical attributes. Future research could address this issue by recruiting children who were not acquainted (e.g., on the first day of a summer camp that receives children from different cities or different schools).

Finally, caution is needed when interpreting leaders' selection of non-overweight peers for agility tasks. It is possible that, like adults in the Nolan et al.'s (2013) study, our child participants have a bias against people who are obese, regardless of their overweight peers' agility skills, or it is also possible that children simply believed that excessive weight might compromise one's agility. Our findings seem to be

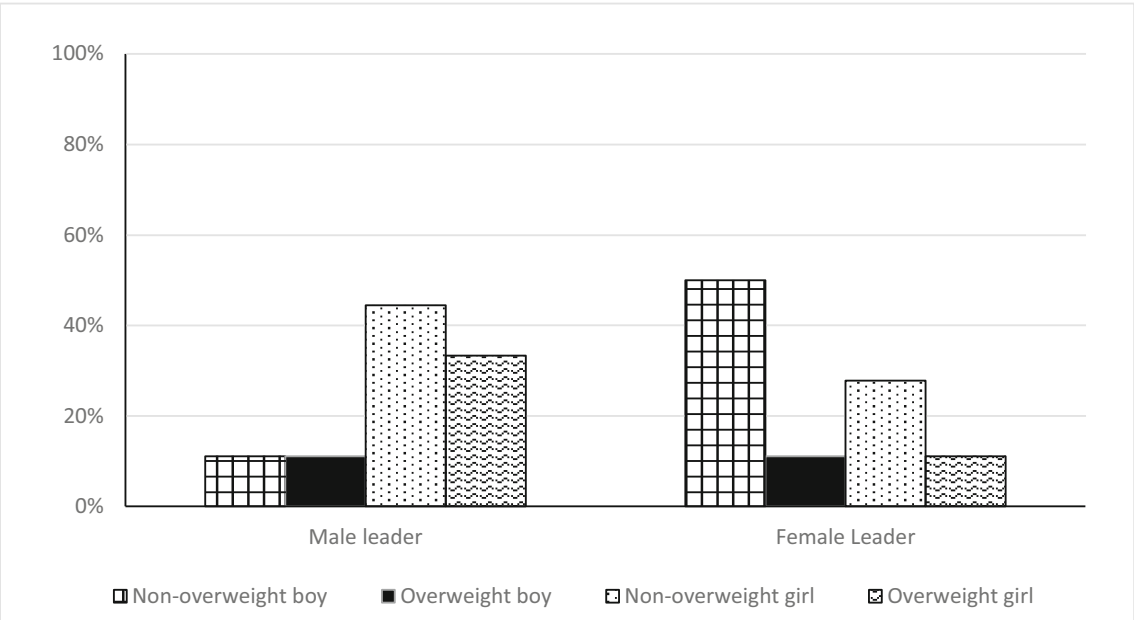

Fig. 2 Relative frequency distribution of last three choices made by male and female leaders

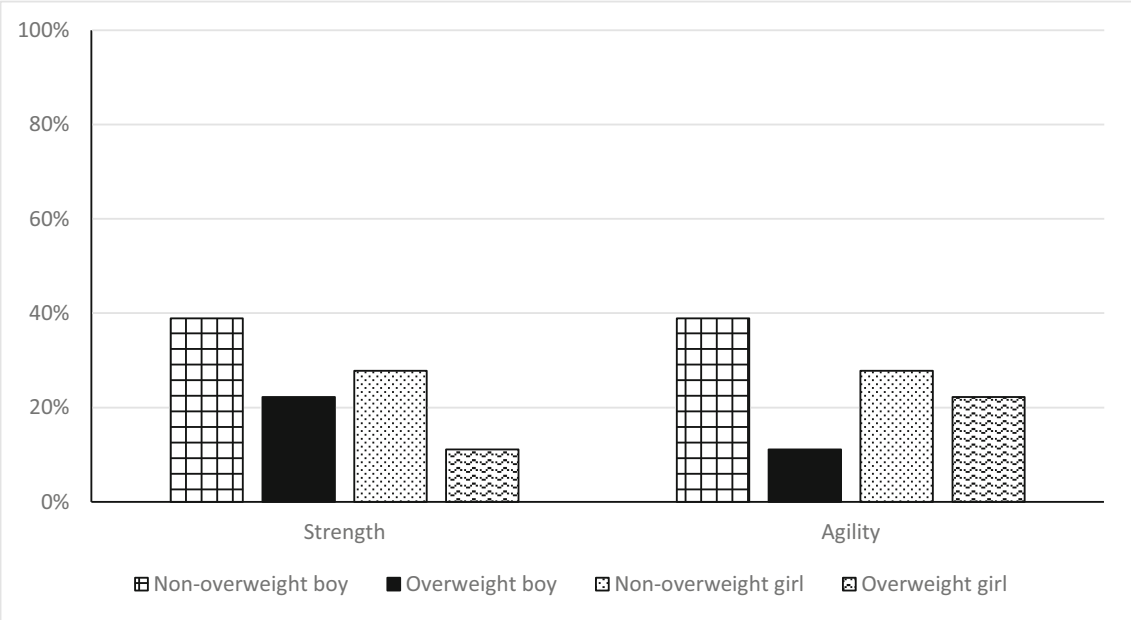

Fig. 3. Relative frequency distribution of leaders' top choices across activities (leaders' genders collapsed)

consistent with previous developmental and behavioral studies, but future studies using IRAP may prove to be very informative, especially because they may reveal implicit and prejudicial bias toward overweight children in domains where body weight is irrelevant (e.g., academic skills, intelligence, social adeptness). Such data could also represent a significant contribution to the planning of intervention programs designed to eliminate prejudice or discrimination in childhood. More importantly, the IRAP procedure may be very helpful as a test of the effects of practical interventions directed toward reducing prejudice against overweight children.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflicts of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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