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Gender Differences in a Youth Physical Activity Intervention: Movement Levels and Children's Perceptions

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ABSTRACT

Background: Sedentary behavior is a public health issue associated with obesity and other chronic health problems. The need for interventions is especially pressing for girls, who have lower levels of physical activity (PA) than boys do, and who are more likely to be overweight and to experience negative emotional states as they approach adolescence. **Purpose**: This study used a mixed-methods approach to examine gender differences in PA levels and perceptions of movement opportunities in an afterschool intervention. **Methods**: Data were collected from 22 children (4th-5th grade) who participated in a 15-week afterschool PA intervention (30, 1 hour sessions). PA levels were measured using accelerometers and perceptions of PA were gathered via focus groups. **Results**: Boys moved significantly more than girls based on total accelerometer counts (310,617 vs. 279,766, $t = -3.63$, $p < .01$) and step counts per session (2,297 vs. 2,100, $t = -3.40$, $p < .01$). Gender differences in PA perceptions emerged regarding competency and relationships. **Discussion**: Understanding gendered differences in PA perceptions are crucial to developing effective afterschool PA interventions. **Translation to Health Education Practice**: Interventions that enhance PA enjoyment for girls should incorporate self-efficacy of physical skills, cooperative style games, and activities that offer social interactions.

A AJHE Self-Study quiz is online for this article via the SHAPE America Online Institute (SAOI) http://portal.shapeamerica.org/trn-Webinars

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Background

According to the World Health Organization,[1] physical inactivity is one of the leading risk factors for morbidity and mortality throughout the lifespan. Sedentary behavior, physical inactivity and obesity are increasingly prevalent public health issues for children and have been linked to numerous negative outcomes.[2] In the United States between 2013–2014, 17.4% of children ages 6–11 were classified as obese.[3] Childhood obesity is associated with serious health risks including high blood pressure, hyperlipidemia, insulin resistance, and type 2 diabetes.[2] The risks for children are not limited to the physical domain. Childhood obesity and inactivity have also been linked to higher rates of anxiety and depression and lower levels of self-esteem and quality of life.[4]

Increasing physical activity (PA) can help reduce some of the risks associated with sedentary behavior but empirical evidence repeatedly indicates boys are more physically active than girls. In comprehensive cross-sectional studies, girls consistently fall below recommended guidelines for physical activity[5,6] and are less likely to engage in moderate to vigorous physical activity (MVPA).[7,8] PA differences between boys and girls magnify as they approach adolescence[9] with age-related declines particularly prominent among girls.[10] For instance, work by Pate and colleagues[11] showed that PA among girls decreased 4% a year between 6th and 8th grade with further PA declines between 8th and 12th grade. Pate et al.[9] suggest the likelihood of participating in PA in 12th grade is strongly associated with PA participation earlier in life. Within the United States (US), gender differences in PA engagement are even greater among children from low-income families and among ethnoracial minorities.[12,13]

Gender disparities in PA place women and girls at greater risk for physical and mental health problems. Without adequate levels of PA, females are susceptible to more cardiovascular problems[14] and higher rates of depression and anxiety.[15] According to the 2017 Youth Risk Behavioral Surveillance Survey,[16] females are less likely to be physically active, more likely than males to be overweight, and significantly more likely to experience feelings of sadness and hopelessness. These health problems are exacerbated for girls and women from ethnic and racial minority groups.[12] For example, the

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obesity rates of Hispanic (50.6%) and Non-Hispanic black women (54.8%) are higher than the rates for Hispanic (43.1%) and Non-Hispanic black men (36.9%), and exceed the rate of non-Hispanic white women (38.0%).[17] As being active is a crucial factor in overall well-being, it is important that efforts be made to develop interventions that enhance girls' participation early in their lives.

According to the US Department of Health and Human Services,[18] youth, aged 6 to 17, should engage in at least 60 minutes of daily MVPA to receive health enhancing benefits. The Comprehensive School Physical Activity Program (CSPAP) is a national framework intended to increase school-based PA opportunities for children using a whole school approach.[19] Within CSPAP, the afterschool program (ASP) environment is viewed as a key setting for increasing PA engagement. Moreover, research conducted by the National Afterschool Alliance[20] shows that ASPs are in high demand and that these programs support a broad spectrum of communities. In 2014, nearly 18% of American children participated in an ASP.[20] Participation in ASPs is even higher for children living in communities of concentrated poverty (24%).[20] While increasing PA engagement for all US children is necessary, facilitating PA opportunities for girls from low-income, minority neighborhoods is especially important because they are less likely than other girls to have regular PE classes[21] or to play organized sports.[12,22]

ASPs that incorporate PA can help reduce sedentary behavior and increase fitness levels in youth,[23–26] but simply providing the space and time for PA may not be sufficient. The 2011 Healthy Eating and Physical Activity (HEPA) Standards in Out-of-School Time Programs[27,28] require ASPs to provide 30 min of daily PA that is developmentally appropriate, inclusive, offers variety, supports MVPA at least 50% of the time, and promotes the health-related benefits of fitness.[28] Although the evidence-based HEPA standards offer clear guidelines, "effective" PA programs do not necessarily appeal to all children, particularly girls. Indeed, multiple studies have demonstrated that boys are more likely than girls to meet PA standards in ASPs[29–31] and to have higher levels of exercise self-efficacy.[32] However, some data suggest that ASPs may be effective as a sustainable intervention to increase PA in girls from minority groups.[33]

The effectiveness of an ASP depends on many programmatic elements. Youth programs are more effective at producing desired levels of PA when children perceive the activities as enjoyable.[34] Youth are more likely to identify PA as fun when they engage in physical movement, learn new skills, have positive experiences with adult facilitators, and are challenged to develop new competencies.[35] Gender is also a critical factor in how students experience and evaluate PA programs; boys are more likely than girls to report enjoying PA and to achieve higher levels of PA during most program sessions.[36–38] Studies show that girls have lower self-perceptions of their athletic abilities than boys, which may partially explain why girls also report lower levels of PA enjoyment, especially as they age.[39,40] Research also shows that girls and boys place different values on sport and other PA experiences. In youth programs, girls preferred PA that reduced stress while boys favored actions involved with speed and risk-taking.[41] Among high school students, boys are more likely to value competitiveness while girls feel more rewarded from mastering skills.[42] Since enjoyment predicts youth PA levels and girls have been shown to derive more reward from activities that reduce stress and build mastery, the extent to which girls remain physically active may be determined, at least in part, by concomitant increases in their self-efficacy.[43] While both boys and girls find social relationships important to PA, these connections are more salient for girls[44] who emphasize social connectedness and prefer "competing *with* someone rather than *against* someone."[45(p277)] Girls are also likely to participate in more PA when they have strong family support[46] and available role models,[47] lending support to a social cognitive framework to best understand and predict girls' PA behavior.

Because boys and girls have different motivations for participating in PA,[48] understanding gendered perceptions of ASPs is instrumental to designing curricula that help youth achieve recommended PA levels within ASPs. As much of the literature about gender effects on PA participation derives from large-scale interventions or epidemiological data, there remains a need for more nuanced examinations of youth perceptions about PA programs, especially among young girls. Such research may help practitioners consider differences in gender while planning and implementing quality ASPs that raise PA levels for boys and girls from diverse neighborhoods.

Purpose

The current study was conducted within a PA afterschool intervention program using a mixed-methods approach. The program, situated in a low-income community, was facilitated during after school hours. The mixed-methods research was guided by the following questions: *Are there gender differences in PA levels during the afterschool intervention? How does gender influence children's perceptions of movement and exercise, both within the afterschool intervention and more broadly?*

Methods

Research context and participants

Researchers collected data from the Physical Activity in Afterschool Program (PAASP) intervention that took place at a parochial grade school located in a small urban center in New Jersey. Most students attending the school live in the nearby community, which can be described as economically disadvantaged. PAASP was sponsored by Monmouth University and organized as a component of the grade school's existing afterschool programing. Children enrolled in the ASP choose from a variety of activities such as art, music, or fitness, including PAASP.

The children who selected PAASP received one hour of structured, supervised, afterschool PA programming twice a week for a total of 15 weeks across one academic year. This included eight weeks during Fall 2017 and seven additional weeks during Spring 2018. The 30 PA sessions were facilitated by trained students, faculty, and staff from the university with support from grade school supervisors. Each PA session began with warm-up exercises or games. Then the children were divided into small groups, which rotated through a series of motor skill stations. At each station, a university facilitator (known as "college friends" in the context of the program) taught a motor skill and organized a related game. If time permitted, the children participated in a group game to conclude the session. During select sessions, some skills stations or group games were replaced with free play. In those periods, a variety of equipment was available and the children organized and engaged in self-directed PA.

Twenty-two children participated in PAASP: eleven boys and eleven girls. All participants were enrolled in either fourth or fifth grade (ages 9–11). There were thirteen fourth graders (59%) and nine fifth graders (41%) enrolled in the program. Monmouth University's IRB approved all recruitment and research materials; PAASP participants gave verbal assent, and each student's parent or guardian provided written consent for their child to participate in ongoing research during the program.

Data collection and analyses

The research team was interested in how gender influenced PA levels as well as how gender shaped perceptions of PA. Therefore, data were collected using a mixed-methods approach. The study relied on a sequential explanatory design[49] where quantitative accelerometer data were collected throughout the program and qualitative focus groups were conducted after the program concluded. The accelerometer data measured PA differences between boys and girls while the qualitative data served as the dominant mode of analysis[50] which helped researchers interpret the quantitative findings.

Quantitative methods

PA data were collected using accelerometers, which provided an objective means of assessing participants' movement during PAASP. Three primary PA measurements were collected: minutes of MVPA, total accelerometer counts, and step counts per session. Each participant wore an ActiGraph model wGT3X-BT accelerometer on their non-dominant wrist. The ActiGraph, which uses a tri-axial accelerometer to provide minute-by-minute activity counts, is a reliable and widely-used method of PA assessment in free-living conditions, and the wrist placement remains an accurate means of classifying both active and sedentary behaviors among children.[51]

The devices were worn one session per week during 14 weeks of the program (i.e., approximately half of the scheduled sessions). On the 14 days when participants wore accelerometers, attendance was 95.1%, with 10 participants (5 girls, 5 boys) having missed at least one class and 12 having zero absences. Only one participant missed more than two of the 14 days, with three days absent.

In the current study, 22 accelerometers were programmed to collect data during each PA session. Children were assigned the same accelerometer each week and were assisted by the research team with wearing the accelerometers correctly. The devices sampled participants' movements at a default frequency of 30 Hz. Data were automatically stored in each unit and, within a week of each data collection point, uploaded to a desktop computer via a USB-linked data port for analysis using ActiGraph's proprietary ActiLife software.

Analysis of the ActiGraph data from participants was accomplished using a combination of the ActiLife software, Microsoft Excel, and IBM SPSS Statistics. The ActiLife program provided the number of steps participants took each session, as well as a calculation of minutes participants spent in MVPA. To do this, each 60-second epoch of activity-count data was coded as "sedentary," "light," "moderate," or "vigorous" according to the frequently used cut-points published by Freedson, Melanson, and Sirard.[52] Data were then exported as Excel files and analyzed using IBM SPSS Statistics version 22.

Qualitative methods

Following the final PAASP session, children were invited to join focus groups to reflect on their experiences. Each group consisted of between four and seven children separated by gender. Previous research shows

that gender homogeneity increases productivity of the groups and richness of the data.[53] Focus groups were further separated by grade in order to make the group size more manageable.[53] In total, the research team conducted four focus groups with 18 participants: fourth grade girls (n = 5), fourth grade boys (n = 4), fifth grade girls (n = 5), and fifth grade boys (n = 4). One fourth grade girl and three fourth grade boys were unable to participate due to an absence of parental consent to participate in the focus groups. In total, 81% of regular PAASP participants took part in a focus group.

The focus groups were conducted by trained researchers who worked with the children each week in the same gymnasium used during the PAASP program. Session moderators used a semi-structured interview guide, which was developed in advance by the research team. While the moderator retained some flexibility in steering the conversation, the structured interview guide encouraged standardization across groups.[54] Since the guiding research question was about gendered perceptions of PA, the focus group interview guide was designed to allow children to give meaningful accounts of their own participation.[55]

The researchers initiated the focus group interviews by asking each child to draw a picture and write a sentence highlighting their favorite part of PAASP. Each child described their picture to the group before the researcher asked the children to name PA skills that they learned and to assess how well they learned those skills. Children assessed their PA competencies by placing colored dots on a large poster board. The color-coded dots indicated skills they improved during PAASP, skills that were 'just okay," and skills that they lacked. This activity was based on aforementioned literature that shows strong relationships between gender, competency, and PA enjoyment.[39,40] After the dot activity, children were asked to evaluate the PAASP program, describe their PA behaviors outside of PAASP, and describe factors that both facilitated PA and acted as barriers to PA. Finally, children described how PA and the PAASP program influenced their self-esteem. As previously mentioned boys and girls value different aspects of PA. These open-ended questions allowed children to compare PA they enjoyed with PA they disliked which offered context for the researchers to interpret accelerometer data. Obtaining open-ended responses in the children's own language helped to ensure descriptive validity of the data.[54,56]

Each focus group lasted approximately one hour. Digital recordings of the focus groups were transcribed by the researchers or by assistants who were present during the session. A second researcher reviewed the transcriptions and filled in missing or inaudible information. All student names were replaced with pseudonyms. Complete transcriptions and digital scans of the children's drawings were uploaded to NVIVO qualitative analysis software, in which a lead researcher coded the drawings and the focus group transcripts. The qualitative coding scheme was adapted from the Children's Attraction to Physical Activity (CAPA) scale,[57,58] which addresses five dimensions of PA that children rate as attractive or unattractive. Two of those dimensions ("liking/disliking of physical exertion and exercise" and "liking of vigorous exercise") were combined. Based on recent findings[35,57] a fifth dimension of "adult interaction" was added. Focus group remarks and drawings were linked with one or more dimensions of this coding scheme, as seen in Table 1. To ensure reliability, three student research assistants independently coded the transcripts and/or the drawings using the same scheme. The three people who classified the illustrations aligned 79% of the time. The lead researcher compared each coder's ratings, eliminated items that were only coded by one researcher and retained codes that were marked by two or more researchers. A similar process was used with the focus groups transcripts. Once the transcript and drawing codes were merged, the researcher observed the frequency and the content of coded responses as they related to children's drawings, their descriptions of skill acquisition, and their enjoyment of PA both within and outside of PAASP. The researcher compared how frequently each dimension of the coding scale was used in boys' responses versus girls' responses and noted whether the content of those coded responses differed.

Results

Results from both quantitative and qualitative methods are reported. As we utilized a sequential explanatory mixed-methods design, accelerometer data are reported first. Then, qualitative focus groups data are presented to help interpret the quantitative findings.

Quantitative PA measures

Three primary PA measurements were analyzed: minutes of MVPA, total accelerometer counts, and step counts per session. As demonstrated in Table 2, all PAASP participants averaged 37.80 minutes in MVPA, exceeding the HEPA Standards of achieving at least 30 min of MVPA per session.

When examining gender differences, two of the three primary PA measurements revealed significantly higher levels of PA engagement among boys than

Table 1. Focus group coding scheme, adapted from children's attraction to physical activity scale.

Dimension	Adapted From	Explanation	Example
Liking/Disliking Physical Activity and Exertion.	CAPA	How do children feel about the affective and cognitive outcomes of exercise itself?	"When we first started doing this we were a little tired but then we got used to it and it was easy for us"
Liking/Disliking Competitive Sports and Games	CAPA	How do children feel when playing specific games and sports?	"Soccer takes a lot of skill and it is really fun to play"
Peer Interactions	CAPA	Does PA facilitate positive or negative reactions with peers?	"I like to do it [PA] with my friends because you can do it together and you are not alone."
Health Benefits	CAPA	How well does PA facilitate other health outcomes, such as weight loss?	"It [exercise] makes me feel good about myself because I am chubby and I need to work out"
Adult Interactions	Literature	Does PA facilitate positive or negative reactions with adults, such as teachers and coaches	"We got to meet new college friends"

Table 2. Physical activity measurements by gender, boys (n = 11) and girls (n = 11) in PAASP after school program.

Variable	Girls	Boys	Total
Mean (sd) Accelerometer counts per session*	279,766.82 (65,195.10)	310, 617.75 (80,195.58)	293,770.83 (73,881.51)
Mean (sd)Minutes Per Session in Moderate to Vigorous Physical Activity	36.27 (5.75)	37.43 (6.44)	37.80 (6.09)
Mean (sd) Step Counts Per Session*	2,100.48 (314.20)	2,297.54 (349.02)	2,189.93 (344.21)

*Significant Gender Difference $p < .05$

among girls during PAASP. In comparison to girls, boys accumulated significantly higher total accelerometer counts per session ($t = -3.63$, $p < .01$) and step counts per session ($t = -3.40$, $p < .01$). Minutes of MVPA were higher for boys (37.43 min) than for girls (36.27 min) but not of statistical significance ($t = -1.63$, $p = .10$). Ultimately, the quantitative data show that boys moved slightly more than girls did, but that boys and girls spent about the same amount of time in MVPA.

Qualitative gendered perceptions of PA

The accelerometer measurements provided raw numbers for children's movements but the qualitative data revealed how children perceived their experiences within the program. Gender comparisons are described throughout the qualitative results, which include analysis of the children's drawings and their conversations. Findings are linked to key dimensions of the coding scheme (listed in Table 1 and denoted with italics).

Illustrations captured children's individual perceptions of the program before engaging in group dialogue. Seventeen out of the eighteen focus group attendees (94%) drew a picture and wrote a sentence about what they liked best about the program. Many of the illustrations featured more than one theme. Children were most likely to note a specific competitive game that they enjoyed; nine students illustrated this dimension of *liking/disliking competitive sports and games*. Six children showed the importance of *peer interactions* ("we got to be around our friends") and six children emphasized *adult interactions* ("the college friends [program facilitators] never gave up on us"). Four children indicated *liking/disliking physical activity and exertion*, without mentioning or depicting a specific game. For example, one student wrote "all of the games here are so fun" and drew a group of people in a circle. *Health benefits* such as "it gets your heart and body moving" were only noted by three children. Boys and girls responded similarly with regards to liking/disliking physical activity and appreciation of health benefits. However, girls were slightly more likely to mention or draw peer interactions. Four girls (40%) drew or discussed the importance of friendships, but only two boys (29%) drew or wrote about their friends. The pattern for adult interactions was identical. Girls were also slightly more likely to express their affinity for the games. Six girls (60%) and three boys (43%) talked about specific games.

Children elaborated on these responses through dialogue in focus groups. Within these conversations, students positively described their experiences in PAASP. Boys and girls both mentioned specific activities and described why they found the games attractive or unattractive. For example, Kevin, a fifth grade boy, "didn't like Quidditch because the stick hurt me." Tamara, a fourth grade girl, liked the obstacle course "because it was cool." Though boys and girls both named games to demonstrate what they liked about the PAASP, discussions played out differently based on gender and age.

Fifth grade boys talked extensively about *liking/disliking games and competitions*. They liked "games that were

hard" and that "took strategy." Jon said that these games "challenge you" and James remarked that "it improves you." Jon, talking about capture the flag, explained that the game "has strategy and cooperation and it was fun because it's challenging to people on the other side trying to guard. You need to dodge them from grabbing you or tagging you." The boys felt frustrated by games that were too hard or that lacked clear goals. For example, they disapproved of volleyball limbo, because it "didn't make sense." They also disliked a version of soccer with modified passing rules intended to involve all players. The boys thought the modified rules were a poor strategy for scoring goals and felt the restrictions made the game too hard. The other three groups also named specific games, like soccer, tennis, and tag. The groups called these games "fun" and "cool." However, girls and younger boys were much more likely to evaluate the games in terms of competency and relationships. These children liked many of the same games that the fifth grade boys disliked. For example, the girls enjoyed the aforementioned soccer game because they could all "stay involved and stay active." Fifth grade girls liked "trying new things" and "getting to be more active." Fourth grade girls and boys both mentioned that the games helped them learn new skills, which they found to be joyful. Marco, a fourth grade boy said, "If you come here, you can learn some new skills and then you can show them to your dad." These responses indicate that the affective and cognitive dimensions of PA were more important than the competition itself. In addition, the girls in particular, enjoyed large group invasion games because they could "be on a team with [their] friends", showing the importance of peer interactions. In summary, older boys liked the strategy and competitive aspect of the games, while younger boys and girls enjoyed developing competencies and working in teams.

Girls and boys also differed on evaluating the skills they acquired through the games and activities. Students were asked to identify the motor skills needed to succeed in PAASP. All four groups identified jumping, kicking, running, and shooting/aiming for a target. Three out of four groups named dribbling, throwing, and teamwork. Collectively, 17 additional skills (bending, catching, flexibility, etc.) were mentioned by one or two groups. There were no gender differences regarding the identification of acquired motor skills, but distinctions arose when students were asked to self-evaluate motor skill competencies. Both boys and girls positively evaluated running capacities, negatively evaluated jumping abilities, and ranked throwing aptitude as somewhere in between. Boys felt that their kicking and dribbling improved, but girls rated those abilities as "just okay" or negative. The opposite was true for aiming at a target.

When asked to explain why they evaluated some skills more favorably, both boys and girls discussed the overall "fun" of the activity but focused on how that fun was connected to their own competence. Boys tended to elaborate on their competencies by placing them in context of specific *competitive games that they liked or disliked*. The fifth grade boys discussed how certain games, like capture the flag or soccer, helped them become better runners with strong kicking abilities. Fourth grade boys also discussed how games either facilitated skills or created anxiety. For example, Ian said, "I got better at serving over the net by playing volleyball." Edgar described an invasion game to elaborate on why he disliked running games: "Sometimes you know how people came close and you were running? Sometimes you were looking to see your team and then you hurt yourself." Girls tended to evaluate their competence more directly when thinking about their ability to perform a task. Tori said she disliked racket sports "because I always missed the ball when it came to me" and Naomi disliked jumping "because when I jump, I can't jump that high." Overall, the girls valued developing skills where they could see personal progress over time while boys valued skills that tied more closely to *competitive sports and games*.

After evaluating PAASP and individual motor skill development, students talked about PA in general. Though boys still tended to name more specific competitive games than girls did, the focus for all groups shifted to their wider perceptions of PA where children described reasons for *liking/disliking physical activity and exertion*. Here all students spoke about the joy they got from increasing their competence and confidence. Astrid, a fifth grade girl explained "after I'm practicing, it makes me feel good that I'm getting better." Fourth grader Nelson said "it makes me feel more confident because every time I try something new, I'm not scared to do it anymore." Additionally, the children liked being able to move around and be physically active. They disliked activities that made them "too tired." Both fifth grade groups also mentioned disliking PA in high-pressure situations. When speaking about pressure, the boys again seem to be more focused on competition, while the girls explained their anxiety in the context of relationships, as demonstrated by the quotes below:

James: I'm nervous when I'm versing [sic] a team that I know is good. You can kind of get stage fright.

Jon: I'm nervous when I shoot that I'm not going to make it for the team.

Natalia: I'm scared in front of other people. Like when we have a volleyball game. Sometimes, I don't want my mom to come because she makes me nervous.

When speaking about PA more broadly, all children explained the *health benefits*. Boys and girls both mentioned being healthier but boys were much more likely to specify "getting stronger" as a health benefit. Three boys mentioned strength but only one girl talked about this benefit. Girls tended to identify health benefits as "Getting your heart pumping" and "feeling great about myself." Fourth grade girls mentioned weight loss benefits of exercising. Multiple fourth grade girls commented on "feeling chubby" and said that they knew exercising could help them become slimmer.

Finally, when evaluating PAASP and PA in general, girls were much more likely to discuss *peer and adult interactions* by discussing relationships with other children, parents, and college friends. Both fourth and fifth grade girls explained that "playing with friends" was a major reason that they liked the program. Naomi mentioned that she did not like the days when groups were divided up because some people would "be left out and have their feelings hurt." Brandi said, "it would be sad to watch a person get out if everyone else was having fun." The girls also mentioned enjoying PA with parents and with the college friends. The boys rarely mentioned these relationships. James said, "finding new teammates makes me nervous" but specified that it was because "you don't know if they will be good or bad" indicating that he cared more about skill level than the relationship itself. When boys talked about relationships, it was typically in the context of a game. For example, Jon loved the teamwork aspect of Capture the Flag and Edgar mentioned that one of the college friends helped him improve at a game. Girls were much more likely to discuss relationships for their own sake. They really enjoyed "having fun" and "spending time" with each other and with the college friends.

When asked about PA engagement outside of PAASP, girls were more likely than boys to mention *peer and adult interactions* as a critical part of the activity. For example, Jon said his parents signed him up for martial arts and Edgar said his dad "tells him" to go outside and practice his serves. Both of these boys discussed how their parents instructed them to be active. However, girls talked about playing games *with* their parents and siblings. Tori liked playing basketball with her dad because they could be together and she could "tease him if he misses." Astrid enjoyed going to the park with her relatives and playing "a family tag game." These findings underscore the value girls place upon relationships when engaging in PA.

Discussion

All participants in PAASP were able to achieve recommended HEPA standards for PA, with an average of just over 36 minutes of MVPA per session. Girls spent slightly less time engaged in MVPA than did boys (36.27 min vs. 37.43 min, respectively). Significant differences were observed in both steps per session and total accelerometer counts, suggesting that boys moved more than girls did during the program, on average. These findings are consistent with gender disparities noted in larger ASP studies,[30,31,38] though the current study has smaller effect sizes. Since research often shows larger differences in boys and girls' movements, it is important to move beyond numbers in order to understand the children's perceptions of the PA opportunities and program and their motivations for engaging in PA. For this particular study, the children's narratives help explain the absence of large gender differences and reveal how the design of the ASP contributed to an inclusive learning environment.

Planning and implementation of PAASP drew heavily upon psychosocial theories examining PA motivation.[59] The ways that children explained their enjoyment was consistent with this collection of theories, which suggest that individuals are intrinsically motivated to be active when the PA meets their psychological needs for competence, relatedness, and positive affect.[59] In our intervention, both boys and girls enjoyed the program (positive affect). They specifically mentioned learning new skills and improving their health (competency) as well as working with peers and adults (relatedness). However, even when boys and girls found joy in the same aspects of the program, they made sense of their experiences differently. While our research provides support for the importance of psychosocial factors, we also show that there are gendered differences in defining competency and thus different motivations for achieving and demonstrating that competency. Furthermore, we suggest that girls placed a higher value on relatedness than boys do, and are thus more likely to be intrinsically motivated by peer and adult relationships. Ultimately, these experiences with competency and relatedness directly influence children's enjoyment of PA.

Competency was important to all children but girls (and some younger boys) were much more likely to appreciate the skills acquired through game play while older boys were more drawn to the competitive and strategic aspects of the same games. Both boys and girls valued the opportunity to develop new skills, which underscores the importance of competency for PA enjoyment[35] and supports previous research that shows boys and girls appreciate different aspects of PA.[41,48] Our findings suggest that perceptions of competency differ by gender; boys discussed proficiency in the context of competitive games while girls spoke more broadly about personal growth and development.

PA programs that emphasize competitive outcomes and disregard skill development may inadvertently be generating more intrinsic motivation among boys than among girls. Academic research might also be constructed in a way that more accurately understands and predicts boys' PA.[48] For instance, one longitudinal study[39] found that girls' physical competence, decreases over time. In this study, researchers measured athletic competence with a six-item scale[60,61]; each of the six items specifically mentions "sports" rather than a variety of PA opportunities.

The focus group illustrations and conversations both showed that girls valued peer and adult interactions more than boys did, which highlights the importance of social connections to girls' PA enjoyment.[44,48] Though empirical research demonstrates that all youth are encouraged by opportunities to socialize and feel worthy,[59] the need for relatedness is even higher among girls. This suggests that PA programs aimed at girls should explicitly focus on meeting their needs for social support as girls have greater intrinsic motivation for PA when those needs are met.

Though instructive, there are a number of limitations to this study. First, the results are based on a small group of students enrolled in one ASP. Both the quantitative and the qualitative data revealed noticeable patterns by grade and by gender, but these trends could have resulted from the unique personalities enrolled in the relatively small program. The accelerometer data was useful to understanding PA movements of the PAASP attendees, but the small sample size serves as a limitation when generalizing to larger populations. While the qualitative results should not be used to draw population-level conclusions about gender differences in PA, they can still help educators and researchers deepen their understanding of how gender influences PA enjoyment. Additionally, this program took place in one unique low-income community. The research team asked students to speak on their experiences outside of the program; however, children may not understand or be able to verbalize the ways in which wider community factors influence their play experiences. Future researchers can expand on this research by further examining how family and community-level factors influence children's perceptions of PA. Studies that examine how these perceptions may be similar to or different from higher-income communities would also expand scholars' understanding of gender and socioeconomic status. Longitudinal studies that examine how these perceptions shift during the aging process would shed light on the reasons for age-related PA decline and give practitioners some strategies to combat that falloff.

Despite some limitations, this study adds important context to the literature about gender and PA. While many researchers note quantitative differences among children's PA, the meanings behind those differences are rarely examined. In this particular intervention, gender differences in PA level were small or not significant. Qualitative data show that programs which are designed to develop competency through personal growth and that emphasize relatedness may help girls achieve recommended PA levels.

Translation to Health Education Practice

The current literature supports the numerous benefits of interventions that increase the physical activity levels of children.[62] This study provides new information about gender differences that influence PA programming. The results may help health and physical educators and Certified Health Education Specialists (CHES) plan and implement more appropriate and inclusive physical activity interventions for children.[63]

Findings indicate that boys and girls enjoy learning new games and developing their skills. Health and physical educators must continue to offer innovative activities that excite grammar and middle school students, while providing sufficient opportunities to improve at the skills needed in those games. However, educators must also make sure that programs address needs of both boys and girls, as we observed that children in disadvantaged communities experienced an afterschool PA program differently based on gender. Because girls are less physically active than boys, it is especially important to develop programs tailored to girls' needs. Doing so can help reduce girls' sedentary behavior, motivate them to engage in PA across the lifespan, and lower their risk of obesity and other chronic diseases.

In particular, girls appreciated becoming more proficient with physical skills and deploying those skills in cooperative style games that strengthened their relationships, whereas boys wanted to test their skills in a more competitive atmosphere. For co-ed programs, it is important to enhance health promotion through creating conducive learning environments, a core NCHEC competency.[63] Our data suggests that balancing competitive and strategic aspects of games with cooperative and competency building goals can help create such an environment and can encourage the broadest and most inclusive participation among youth. Following this, effective PA programs should include competitive sports and games (such as soccer, volleyball, and tag) as well as individually focused activities such as circuit training or yoga. These activities can be modified to include the social connectedness

that is instrumental for girls' enjoyment. For example, children can work with a team member to see how many jumping jacks the team can perform in 30 seconds. After a brief rest, teams can be encouraged to surpass their own previous number (which would emphasize personal competency) or to accumulate more jumping jacks than the other teams (which would highlight competitiveness). Such a balance would provide peer support in challenging youth to improve their personal abilities while also creating opportunities to develop physical skills within a competitive context.

Educators can also be inclusive of different motivations when program activities involve making groups or teams. During some sessions, we let the students choose their own groups. While this helped facilitate peer relationships, the groups were imbalanced in terms of skill and thus the contests were not competitive. During other sessions, we created the groups in order to foster a more competitive environment. It is also important to make sure that relationships, not just individual achievements, are emphasized in ASP programs. For example, after each session, we asked students to talk about the skills that they had improved at, but we also requested that they give a compliment to someone who helped them to make those improvements.

Designing PA programs with gender differences in mind will help ensure that both boys and girls find enjoyment in some aspect of PA. In addition, when planning and implementing health and physical education programs, tailoring and adapting interventions to consider gender differences supports several competencies and sub-competencies for Certified Health Education Specialists.[63] Hopefully, creating space for girls to enjoy PA in middle and grammar school will build the foundation for lifelong activity, thus increasing the positive benefits of PA throughout their lifespan and decreasing the health risks associated with sedentary behavior.

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References

1. World Health Organization. Global health risks: mortality and burden of disease attributable to selected major risks. https://www.who.int/healthinfo/global_burden_disease/GlobalHealthRisks_report_full.pdf. Published 2009. Accessed November 9, 2019.
2. Chung ST, Onuzuruike AU, Magge SN. Cardiometabolic risk in obese children. *Ann N Y Acad Sci*. 2018;1411(1):166–183. doi:10.1111/nyas.13602.
3. Ogden CL, Carroll MD, Lawman HG, et al. Trends in obesity prevalence among children and adolescents in the United States, 1988–1994 through 2013–2014. *JAMA*. 2016;315(21):2292–2299. doi:10.1001/jama.2016.6361.
4. Moharei F, Norooziasl S, Bedhani F, Ghaemi N. Evaluating of psychiatric behavior in obese children and adolescents. *Iran J Child Neurol*. 2018;12:26–36.
5. Armstrong S, Wong CA, Perrin E, Page S, Sibley L, Skinner A. Association of physical activity with income, race/ ethnicity,and sex among adolescents and young adults in the United States: findings from the national health and nutrition examination survey, 2007–2016. *JAMA Pediatr*. 2018;172(8):732–740. doi:10.1001/jamapediatrics.2018.1273.
6. Pate RR, Stevens J, Pratt C, et al. Objectively measured physical activity in sixth-grade girls. *Arch Pediatr Adolesc Med*. 2006;160(12):1262–1268. doi:10.1001/archpedi.160.12.1262.
7. Belcher BR, Berrigan D, Dodd KW, Emken BA, Chou CP, Spruijt-Metz D. Physical activity in US youth: effect of race/ethnicity, age, gender, and weight status. *Med Sci Sports Exerc*. 2010;42(12):2211–2221. doi:10.1249/MSS.0b013e3181e1fba9.
8. Hubbard K, Economos CD, Bakun P, et al. Disparities in moderate-to-vigorous physical activity among girls and overweight and obese schoolchildren during school- and out-of-school time. *Int J Behav Nutr Phys Act*. 2016;13(1). doi:10.1186/s12966-016-0358-x.
9. Pate RR, Dowda M, O'Neill JR, Ward DS. Change in physical activity participation among adolescent girls from 8th to 12th grade. *J Phys Act Health*. 2007;4(1):3–16. doi:10.1123/jpah.4.1.3.
10. Webber LS, Catellier DJ, Lytle LA, et al. Promoting physical activity in middle school girls: trial of activity for adolescent girls. *Am J Prev Med*. 2008;34(3):173–184. doi:10.1016/j.amepre.2007.11.018.
11. Pate RR, Stevens J, Webber LS, et al. Age-related change in physical activity in adolescent girls. *J Adolesc Health*. 2009;44(3):275–282. doi:10.1016/j.jadohealth.2008.07.003.
12. Staurowsky EJ, DeSousa MJ, Miller KE, et al. Her life depends on it iii: girls and women of color. https://www.womenssportsfoundation.org/articles_and_report/life-depends-iii-girls-women-color/. Published 2014. Accessed May 26, 2017.

13. Stovitz SD, Steffen LM, Boostrom A. Participation in physical activity among normal- and overweight hispanic and non-hispanic white adolescents. *J Sch Health*. 2007;78(1):19–25. doi:10.1111/j.1746-1561.2007.00261.x.
14. Andersen LB, Harro M, Sardinha LB, et al. Physical activity and clustered cardiovascular risk in children: a cross-sectional study (the European youth heart study). *Lancet*. 2006;368(9532):299–304. doi:10.1016/S0140-6736(06)69075-2.
15. Gibson LY, Allen KL, Davis E, Blair E, Zubrick SR, Byrne SM. The psychosocial burden of childhood overweight and obesity: evidence for persisting difficulties in boys and girls. *Eur J Pediatr Berl*. 2017;176(7):925–933. doi:10.1007/s00431-017-2931-y.
16. Kann L, McManus T, Harris WA, et al. Youth risk behavior surveillance—United States, 2017. *MMWR Surveill Summ*. 2018;67(8):1–114. doi:10.15585/mmwr.ss6708a1.
17. Hales CM, Caroll MD, Fryar CD, Ogden CL. *NCHS data brief: prevalence of obesity among adults 2015–2016*. NCHS data brief, no 288. https://www.cdc.gov/nchs/data/databriefs/db288.pdf. Published October, 2017. Accessed July 29, 2019.
18. US Department of Health and Human Services. *Physical Activity Guidelines for Americans*. 2nd ed. https://health.gov/paguidelines/second-edition/pdf/Physical_Activity_Guidelines_2nd_edition.pdf. Published 2018. Accessed March 18, 2019.
19. US Centers for Disease Control and Prevention. Comprehensive school physical activity programs: a guide for schools. https://www.cdc.gov/healthyschools/professional_development/e-learning/cspap/_assets/FullCourseContent-CSPAP.pdf. Published August 27, 2018. Accessed March 18, 2019.
20. Afterschool Alliance. America after 3pm: afterschool programs in demand. http://www.afterschoolalliance.org/documents/AA3PM-2014/AA3PM_National_Report.pdf. Published 2014. Accessed May 15, 2019.
21. Sabo D, Veliz P. *Go Out and Play: Youth Sports in America*. East Meadow, NY: Women's Sports Foundation; 2008.
22. Braddock JH, Sokol-Katz J, Greene A, Basinger-Fleischman L. Uneven playing fields: state variations in boys' and girls' access to and participation in high school interscholastic sports. *Sociol Spectr*. 2005;25(2):231–250. doi:10.1080/02732170590884040.
23. Arundell L. Contribution of the after-school period to children's daily participation in physical activity and sedentary behaviours. *PLoS One*. 2015;10(10):e0140132. doi:10.1371/journal.pone.0140132.
24. Madsen KA, Thompson HR, Wlasiuk L, Queliza E, Schmidt C, Newman TB. After-school program to reduce obesity in minority children: a pilot study. *J Child Health Care*. 2009;13(4):333–346. doi:10.1177/1367493509344823.
25. Barbeau P, Johnson MH, Howe CA, et al. Ten months of exercise improves general and visceral adiposity, bone, and fitness in black girls. *Obes Silver Spring*. 2007;15(8):2077–2085. doi:10.1038/oby.2007.247.
26. Gutin B, Yin Z, Johnson M, Barbeau P. Preliminary findings of the effect of a 3-year after-school physical activity intervention on fitness and body fat: the medical college of Georgia Fitkid project. *Int J Pediatr Obes*. 2008;3(S1):3–9. doi:10.1080/17477160801896457.
27. Afterschool Alliance. America after 3pm: kids on the move: afterschool programs promoting healthy eating and physical activity. http://www.afterschoolalliance.org/aa3pm/kids_on_the_move.pdf. Published 2015. Accessed May 15, 2019.
28. Weicha J, Gannett E, Roth B National afterschool association standards for healthy eating and physical activity. http://www.niost.org/pdf/host/Healthy_Eating_and_Physical_Activity_Standards.pdf. Published 2011. Accessed May 14, 2019.
29. Beets MW, Rooney L, Tilley F, Beighle A, Webster C. Evaluation of policies to promote physical activity in afterschool programs: are we meeting current benchmarks? *Prev Med*. 2010;51(3–4):299–301. doi:10.1016/j.ypmed.2010.07.006.
30. Beets MW, Huberty J, Beighle A. Physical activity of children attending afterschool programs. *Am J Prev Med*. 2012;42(2):180–184. doi:10.1016/j.amepre.2011.10.007.
31. Trost SG, Rosenkranz RR, Dzewaltowski D. Physical activity levels among children attending after-school programs. *Med Sci Sports Exerc*. 2008;40(4):622–629. doi:10.1249/MSS.0b013e318161eaa5.
32. Fahlman M, Hall HL, Gutuskey L. Minority youth, physical activity, and fitness levels: targeted interventions needed. *Am J Health Educ*. 2015;46(6):338–346. doi:10.1080/19325037.2015.1077758.
33. Taverno Ross SE, Dowda M, Colabianchi N, Saunders R, Pate RR. After-school setting, physical activity, and sedentary behavior in 5th grade boys and girls. *Health Place*. 2012;18(5):951–955. doi:10.1016/j.healthplace.2012.06.013.
34. Li Y-C, Joshi D, King-Dowling S, Hay J, Faught BE, Cairney J. The longitudinal relationship between generalized self-efficacy and physical activity in school-aged children. *Eur J Sport Sci*. 2018;18(4):569–578. doi:10.1080/17461391.2018.1430852.
35. Hopple CJ. Top 10 reasons why children find physical activity to be fun. *Strategies*. 2018;31(3):40–47. doi:10.1080/08924562.2018.1442272.
36. Johnson CE, Erwin HE, Kipp L, Beighle A. Student perceived motivational climate, enjoyment, and physical activity in middle school physical education. *J Teach Phys Educ*. 2017;36(4):398–408. doi:10.1123/jtpe.2016-0172.
37. Yang B, Allums-Featherston K, Saint-Maurice PF, Welk GJ, Candelaria N. Evaluation of youth enjoyment toward physical activity and sedentary behavior. *Pediatr Exerc Sci*. 2018;30(2):273–280. doi:10.1123/pes.2017-0101.
38. Mears R. Effectiveness of after-school interventions at increasing moderate-to-vigorous physical activity levels in 5- to 18-year olds: a systematic review and meta-analysis. *Br J Sports Med*. 2016;50(21):1315–1324. doi:10.1136/bjsports-2015-094976.
39. Cairney J, Kwan MY, Velduizen S, Hay J, Bray SR, Faught BE. Gender, perceived competence and the enjoyment of physical education in children: a longitudinal examination. *Int J Behav Nutr Phys Act*. 2012;9(1):26. doi:10.1186/1479-5868-9-26.
40. Prochaska JJ, Sallis JF, Slymen DJ, McKenzie TL. A longitudinal study of children's enjoyment of

physical education. *Pediatr Exerc Sci*. 2003;15(2):170–178. doi:10.1123/pes.15.2.170.
41. Griffiths LA, Griffiths MA. Evaluation of a school–community linked physical activity intervention targeting 7- to 12-year-olds: a sociocultural perspective. *Am J Health Educ*. 2019;50(2):112–126. doi:10.1080/19325037.2019.1571961.
42. Duda J. Relationship between task and ego orientation and the perceived purpose of sport among high school athletes. *J Sport Exerc Psychol*. 1989;11:318–335.
43. Forthofer M, Dowda M, O'Neill JR, et al. Effect of child gender and psychosocial factors on physical activity from fifth to sixth grade. *J Phys Act Health*. 2017;14(12):953–958. doi:10.1123/jpah.2016-0487.
44. Zarrett N, Sorensen C, Cook BS. Physical and social-motivational contextual correlates of youth physical activity in underresourced afterschool programs. *Health Educ Behav*. 2015;42(4):518–529. doi:10.1177/1090198114564502.
45. Cooky C. "Girls just aren't interested": the social construction of interest in girls' sport. *Sociol Perspect*. 2009;52(2):259–283. doi:10.1525/sop.2009.52.2.259.
46. Taverno Ross SE, Dowda M, Dishman RK, Pate RR. Classes of physical activity and sedentary behavior in 5th grade children. *Am J Health Behav*. 2016;40(3):352–361. doi:10.5993/AJHB.40.3.7.
47. Garcia AW, Broda MAN, Frenn M, Coviak C, Pender NJ, Ronis DL. Gender and developmental differences in exercise beliefs among youth and prediction of their exercise behavior. *J Sch Health*. 1995;65(6):213–219. doi:10.1111/j.1746-1561.1995.tb03365.x.
48. Branscum P, Bhochhibhoya A. Exploring gender differences in predicting physical activity among elementary aged children: an application of the integrated behavioral model. *Am J Health Educ*. 2016;47(4):234–242. doi:10.1080/19325037.2016.1178608.
49. Creswell JW, Plano Clark VL, Gutmann M, Hanson WE. Advanced mixed methods research designs. In: Tashakkori A, Teddlie C, eds. *Handbook of Mixed Methods in Social & Behavioral Research*. Thousand Oaks, CA: SAGE; 2003:209–241.
50. Leech NL, Onwuegbuzie AJ. A typology of mixed methods research designs. *Qual Quant Dordr*. 2009;43(2):265–275. doi:10.1007/s11135-007-9105-3.
51. van Loo CMT, Okely AD, Batterham MJ, et al. Wrist accelerometer cut-points for classifying sedentary behavior in children. *Med Sci Sports Exerc*. 2017;49(4):813–822. doi:10.1249/MSS.0000000000001158.
52. Freedson PS, Melanson E, Sirard J. Calibration of the computer science and applications, Inc. accelerometer. *Med Sci Sports Exerc*. 1998;30(5):777–781. doi:10.1097/00005768-199805000-00021.
53. Heary CM, Hennessy E. The use of focus group interviews in pediatric health care research. *J Pediatr Psychol*. 2002;27(1):47–57. doi:10.1093/jpepsy/27.1.47.
54. Jayasekara RS. Focus groups in nursing research: methodological perspectives. *Nurs Outlook*. 2012;60(6):411–416. doi:10.1016/j.outlook.2012.02.001.
55. Cohen DJ, Crabtree BF. Evaluative criteria for qualitative research in health care: controversies and recommendations. *Ann Fam Med*. 2008;6(4):331–339. doi:10.1370/afm.818.
56. Kidd PS, Parshall MB. Getting the focus and the group: enhancing analytical rigor in focus group research. *Qual Health Res*. 2000;10(3):293–308. doi:10.1177/104973200129118453.
57. Brustad RJ. Who will go out and play? Parental and psychological influences on children's attraction to physical activity. *Pediatr Exerc Sci*. 1993;5(3):210–223. doi:10.1123/pes.5.3.210.
58. Rose E, Larkin D, Hands B, Howard B, Parker H. Evidence for the validity of the children's attraction to physical activity questionnaire (CAPA) with young children. *J Sci Med Sport*. 2009;12(5):573–578. doi:10.1016/j.jsams.2009.05.009.
59. Weiss MR. Back to the future: research trends in youth motivation and physical activity. *Pediatr Exerc Sci*. 2013;25(4):561–572. doi:10.1123/pes.25.4.561.
60. Harter S. The perceived competence scale for children. *Child Dev*. 1982;53(1):87–97. doi:10.2307/1129640.
61. Muris P, Meesters C, Fijen P. The self-perception profile for children: further evidence for its factor structure, reliability, and validity. *Personal Individ Differ*. 2003;35(8):1791–1802. doi:10.1016/S0191-8869(03)00004-7.
62. Dowda M, Taverno Ross SE, McIver KL, Dishman RK, Pate RR. Physical activity and changes in adiposity in the transition from elementary to middle school. *Child Obes*. 2017;13(1):53–62. doi:10.1089/chi.2016.0103.
63. National Commission for Health Education Credentialing, Inc. Responsibilities & competencies. https://www.nchec.org/responsibilities-and-competencies. Published 2015. Accessed November 11, 2019.