



## **Determinants of Attendance at a Physical Activity Focused Afterschool Program in Elementary School Children**

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### ABSTRACT

*International Journal of Exercise Science 11(5): 137-151, 2018.* Afterschool youth physical activity (PA) programs provide opportunities for increasing children's time engaged in moderate-to-vigorous physical activity (MVPA). However, low program attendance reduces the benefits of participating in these programs. The purpose of this study was to determine if enjoyment, athletic competence and motivation for PA predict youth attendance at a free afterschool PA program from 3rd to 5th grade. Data were collected from a larger randomized community trial examining the effectiveness of an afterschool program for increasing opportunities to engage in MVPA. Data were collected twice annually (fall/spring) over 3 school years (3<sup>rd</sup> - 5<sup>th</sup> grade) in 9 schools. Analyses were stratified by grade and sex, and a series of multi-level linear regression models were utilized to determine if baseline levels of the psychosocial determinants predicted annual attendance as a percentage of afterschool sessions attended. Amotivation for PA was negatively associated with attendance in boys and non-self-determined extrinsic motivation was positively associated with attendance in girls in the 5<sup>th</sup> grade. Age was associated with a 13.72% reduction in attendance in the 3rd grade, a 12.87% attendance reduction in the 4th grade, and a 7.93% attendance in reduction in the 5th grade. Race was also associated with attendance. Non-White youth attended the program 13.56% less in the 3rd grade, 17.35% less in the 4th grade, and 21.53% less in the 5th grade than White youth. The findings suggest that attendance to PA afterschool programming may be associated with children's motivational characteristics, but that other variables should be identified for further research.

**KEY WORDS:** Youth, motivation, multilevel modeling, athletic competence

### INTRODUCTION

Childhood obesity is at epidemic levels (36), and solutions are actively being sought to provide opportunities for physical activity (PA) that might prevent or mitigate the health effects of obesity in children (51). Schools are considered important settings to increase youth PA since they serve the majority of children, have facilities (e.g., gyms, fields) that are supportive of PA, and provide opportunities for the active promotion of PA (e.g., recess, physical education classes, afterschool programs) (46). Although physical education (PE) classes provide PA opportunities for children, the time for PE is limited due to the increased emphasis on academic achievements (4). In addition, this restricted time is often reserved for the development of motor skills and/or sport and game education (43, 44). Since PE time is limited, afterschool programs are often targeted as school-based settings to provide opportunities for PA without interfering with the school day and they emphasize positive youth development and enrichment activities (18).

Research has demonstrated that afterschool PA programs can provide opportunities for school-aged youth to engage in moderate-to-vigorous physical activity (MVPA) and potentially improve body composition (5, 6, 31, 56). However, attendance at free afterschool PA programs is often low or irregular. The realized health benefits youth can get from participating in the programs may be lost without regular attendance (56). Previous studies on free or subsidized afterschool programs have had enrollment rates of approximately 50% of elementary school students and average attendance rates ranging from 1.9 to 2.4 days per week for each student (24). More recent data have indicated participation in afterschool programs is on the rise (1). The America After 3PM Survey indicated that children attended an afterschool program an average of 3.62 days per week (1). Given the importance of engaging youth to attend after school PA programs, there is a need to identify potential psychosocial determinants that influence the efficacy and participation in these interventions (39). Furthermore, research identifying psychosocial determinants for youth PA participation is a relatively understudied area in the literature (3, 15, 41, 53).

The construct of motivation has been conceptualized as a key component of participation among children in a variety of behavioral treatment programs (34). Previous work on motivational theory among children has indicated that one of the primary drivers for fulfillment is the need for competence (21, 28, 52). Competence is broadly defined as mastery of major developmental tasks that are expected for a person of a given age and gender in the context of his or her culture, society, and time, or more specific domains like athletics or academics (21, 28, 52). PA research has demonstrated a strong association between children's athletic competence and remaining physically active into adolescence and adulthood (2, 8, 42). Children that have the perceived competence to do a sport or PA is integral to them adopting the activity (21). Perceived competence is the individual's own beliefs or predictions concerning their abilities or performance, which may be different than the actual performance itself (21). When a child attempts to be competent at a sport and has success, he or she becomes motivated to continue the activity (21). Whereas children that perceive themselves to have low competence at a sport are more likely to discontinue their participation in the activity (21).

Current research suggests that in addition to competence, the study of motivational constructs from Self-Determination Theory (SDT) could expand knowledge of children's PA participation (13). SDT is a broad theoretical framework that focuses on human motivation in a variety of social contexts (12). It has been used extensively to study motivation for PA in a variety of settings and age groups (45). Researchers operationalize motivation using SDT as a continuum between intrinsic and extrinsic motivation, or as amotivation, which is the absence of motivation. Individuals that are intrinsically motivated to engage in an activity do so out of enjoyment or personal fulfilment, while extrinsically motivated individuals choose to do an activity for some type of external outcome or reward (e.g. financial incentives or public praise) (12). SDT includes varied types of extrinsic motivations, which differ in terms of their relative autonomy. For example non-self-determined extrinsic motivation is a controlled form of motivation, where individuals are motivated to comply with reward and punishment contingencies (45). An example of this would be children that are motivated to get good grades at school in order to avoid punishment from their parents. Whereas self-determined extrinsic motivation is a more autonomous form of extrinsic motivation and involves the willingness to complete a task because of its personal value or utility to the individual (45). An example of this is people that exercise because they value the outcome of good health or improved body image, as opposed to being intrinsically motivated to do it for fun. A fundamental hypothesis for applying SDT to children and PA is that autonomous motivation would be associated with greater levels of PA, whereas controlled forms of motivation would undermine children's PA. Prior work has demonstrated this to be the case with primary school children ages 7 to 11 years (41). Results from this study demonstrated that intrinsic motivation was the only SDT domain associated with PA (41).

Alternatively, PA researchers have also studied the construct of enjoyment as a mechanism of PA participation, independent of broader theoretical models like SDT (50). Among children, studies examining the association between enjoyment and physical activity program participation show mixed results. Several studies suggest that enjoyment plays a critical role in regular adherence to PA (40, 50). For example, one study found that enjoyment mediated the amount of PA engaged in by adolescent girls in a comprehensive school-based intervention (15). Previous work that examined demographic and psychological correlates of youth PA in school children indicated that enjoyment of PE classes was a robust predictor of PA for both younger children (grades 4-6) and older children (grades 7-12) (38). However, another review found no association between enjoyment and PA among children ages 4 - 12 years (47).

Prior research has found positive associations between intrinsic motivation, perceptions of competence, and enjoyment with increased participation in youth PA programs, particularly organized youth sports and PE classes (3, 38, 48, 53). Additionally, several correlates that cannot be modified in interventions, such as age, gender, and socioeconomic status are also associated with youth PA participation (38, 47). It remains unclear the extent to which constructs associated with PA participation are also associated with attendance at PA focused afterschool programs (35). The Medical College of Georgia FitKid Project (FitKid) is a free, 3-year afterschool PA program in a sample of elementary school youth observed from 3<sup>rd</sup> to 5<sup>th</sup> grade (54). The purpose of the current study was to examine if enjoyment, athletic competence,

and intrinsic motivation predict youth attendance at the FitKid afterschool PA program. Additionally, we assessed the extent to which sociodemographic factors modify the association between mechanisms of PA participation and attendance.

## **METHODS**

### *Participants*

The FitKid participants involved 3<sup>rd</sup> graders attending 18 eligible schools (9 intervention and 9 control) in Richmond County, Georgia at the beginning of the 2003 - 2004 school year (54). All participants were invited to enroll in the program free of charge at the beginning of the school year. A total of 1187 students were assigned to either the intervention group (n = 603) or the control group (n =584) and by the end of the third year 195 students completed the intervention and 205 remained in the control group. Only participants in the intervention group with complete data were included in the present data analyses.

Details of participant recruitment can be found elsewhere (54). But briefly, research staff visited each school during the students' PE classes and explained the purpose of the study. Students that were interested in participating in the program were given consent forms to take home to their parents to sign and return them back to the research staff. Prior to data collection, children provided verbal assent in the presence of a school representative. In the consent forms it was explained to parents that each child's school could either be randomly assigned to the intervention or serve as a control site. The children were encouraged to attend the program at least 3 days per week in order to get the full benefits of the program, while still having flexibility to participate in other afterschool programs (54). All procedures were approved by the Institutional Review Board of the Medical College of Georgia.

### *Protocol*

The Fitkid program was a structured 120-minute after school program that was designed to provide 80 minutes of moderate-to-vigorous PA (MVPA) to participants on site at each intervention school (54). The program involved a 40-minute academic enrichment period in which subjects received assistance with their homework, a healthy snack that followed USDA guidelines, and the PA activities, followed by the 80 minutes of PA (54). The PA was structured to involve 20 minutes of warm up activities, 40 minutes of continuous MVPA, 10 minutes of calisthenics, and 10 minutes of warm down activities (54). The 40 minutes of MVPA included modified tag games and ball games aimed at getting the subjects' average exercise heart rates to at least 140 bpm (54). To monitor intensity, at least 50% of the children wore heart rate monitors each day. All subjects were provided transport from school to home after each session by buses paid for by the study (54).

The Fitkid instructors consisted of PE teachers, classroom teacher, and paraprofessionals that received training at the beginning of the school year and during the winter breaks. The program was designed and delivered to facilitate a "mastery-oriented climate for PA" defined as a social environment allowing for enjoyment, autonomy, and the development of competence in sport skills and fitness activities(17). Elements of the curriculum included an

educational focus on sports skills, engaging in activities that focused on confidence building and team play, and a monthly theme for each school site (e.g. dance or soccer) that was developed by instructors based on participant interests. The full details of the program development are available in previous publications (54, 55, 56).

Measures: Data were collected by trained research staff and school nurses. Physiologic data were measured in a 38-foot mobile testing laboratory during early hours on school grounds and questionnaires were administered in each school's cafeteria or classrooms. Data were collected twice annually (fall and spring terms).

Enjoyment. PA enjoyment was assessed with a modified version of the Physical Activity Enjoyment Scale (PACES), which consisted of 16 items for participants to rate their agreement on a 5-point Likert Scale (1 = "Disagree a lot" to 5 = "Agree a lot") (33). A higher score indicates greater PA enjoyment. The scale was pilot tested with an independent sample of 3<sup>rd</sup> grade students, which resulted in the word "depressed" in item-7 being changed to the word "sad" (32). No other changes were deemed necessary. The scale was tested for internal consistency and convergent validity at baseline. The overall internal consistency was strong ( $\alpha = 0.87$ ), and the scale demonstrated significant item total-correlations with task goal orientation ( $r = .65, p < .01$ ), athletic competence ( $r = .23, p < .01$ ), physical appearance ( $r = .20, p < .01$ ), and self-reported PA ( $r = .16, p < .01$ ) (32).

Athletic competence. Athletic competence was assessed with the Self-Perception Profile for Children (SPPC) (22). The SPPC is a 36-item instrument with 5 subscales designed to assess children's subjective evaluation of their own athletic ability and global perceptions of their self-worth (22). Each item is scored on a 4-point scale, with a higher score reflecting a more positive view of oneself. Previous research has reported acceptable internal consistency ( $\alpha = 0.8$ ) for the athletic competence subscale in the SPPC (23). For this study the coefficient alpha was moderate at baseline, with an  $\alpha = 0.61$ .

Motivation. Intrinsic motivation, self-determined extrinsic motivation, non-self-determined extrinsic motivation, and amotivation for PA were assessed with the Pictorial Motivation Scale (PMS). The PMS consists of a picture and phrase depicting 16 items related to participation in sports and PA (37). The items are divided into the 4 subscales based on the SDT constructs, intrinsic motivation, self-determined extrinsic motivation, non-self-determined extrinsic motivation, and amotivation. Each item is scored from 1-3, where a 1 indicates "not like me," a 2 indicates "a little bit like me," and a 3 indicates "like me." Score range from 4 - 12 for each subscale. Higher scores indicate a higher score for each motivational construct. In the present sample, the scale displayed poor internal consistency and construct validity during the 3<sup>rd</sup> and 4<sup>th</sup> grade waves, but acceptable internal consistency and factor structure among FitKid participants during their 5<sup>th</sup> grade year. The coefficient alpha for the subscales ranged from 0.71 to 0.77, and results of the confirmatory factor analysis indicated that the hypothesized factor structure was a good fit [ $\chi^2 (88) = 185.47, p < .01, CFI = .96, RMSEA = .048, SRMR = .054$ ] for the data (37).



Attendance. Children's program attendance was recorded over 3 years by program staff. Each child's attendance rate was calculated as the days that a child attended the program divided by total number of days that the program was offered for each semester (approximately 128 school days per year).

BMI. Each participant's weight and height was measured twice. Weight was measured with the SECA Bellamissa 841 digital weight scale (SECA, Hanover, MD) and height was measured with the SECA 225 stadiometer (54). The means were used to calculate BMI.

### *Statistical Analysis*

Multilevel linear regression models were employed for the third through 5<sup>th</sup> grade years, adjusted for clustering at the program and individual level. For the first series of models conducted for the 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> grade years, attendance (%) was regressed onto PA enjoyment and athletic competence measured at the beginning of the school year, while controlling for sex (male = 1), age, race (White = 1), and BMI [weight (kg)/ height (m<sup>2</sup>)] (age and BMI were allowed to vary over time). Interaction terms were tested for race by PA enjoyment and race by athletic competence. Models were then run for boys and girls separately. For the second series of models, data from the 5<sup>th</sup> grade year were utilized, as the scale exhibited poor psychometric properties when administered in the 3<sup>rd</sup> and 4<sup>th</sup> grade years. Attendance (%) was regressed onto the SDT constructs (intrinsic motivation, self-determined extrinsic motivation, non-self-determined extrinsic motivation, and amotivation) while controlling for sex (male = 1), age, race (White = 1), and BMI at beginning of 5<sup>th</sup> grade. Models were then run for boys and girls separately. For all models, non-dichotomous predictors were centered on their mean values to aid in interpretation. All analyses were conducted in STATA 13.1 (StataCorp LP, College Station, TX).

## **RESULTS**

The mean, standard deviation, and range of the variables included in the multivariable analyses can be seen in Table 1. In general, attendance declined each year from a high of 61% (~ three days per week) in 3<sup>rd</sup> grade, to a low of 42% in 5<sup>th</sup> grade (~ two days per week).

PA Enjoyment and Athletic Competence as Predictors of Attendance in 3<sup>rd</sup> – 5<sup>th</sup> Grade: For PA enjoyment and athletic competence, participating children who provided complete data for each school year (fall/spring) were included in analyses (Table 2). For all years, age and race were significantly associated with attendance in the total sample, with older children less likely to attend the program. The associations for age and race were significant for all grades in boys, but race was not associated with attendance in girls in third grade. Neither BMI, PA enjoyment, athletic competence, nor the enjoyment/competence by race interaction terms was associated with attendance in the total sample or in the sex specific models.

SDT Constructs as Predictors of Attendance in 5<sup>th</sup> Grade: Fifth grade youth with complete data were included in the analyses (Table 3). Age was a significant predictor of attendance in the overall sub-sample and girls, but not in boys, with older girls attending less frequently. Race

was also associated with attendance in all sub-samples, with non-White youth attending less frequently than White youth. Baseline BMI, athletic competence, PA enjoyment, intrinsic motivation, and self-determined extrinsic motivation were not associated with attendance. Non-self-determined extrinsic motivation was a significant predictor of attendance in the overall sub-sample, and this effect was driven by girls, with higher levels of non-self-determined extrinsic motivation associated with higher attendance. Amotivation was not a significant predictor in the overall sample, but it was in boys, with higher levels of amotivation associated with lower attendance.

**Table 1.** Descriptive statistics for baseline measurement of psychosocial variables by grade.

	3 <sup>rd</sup>		4 <sup>th</sup>		5 <sup>th</sup>	
	(n = 180)		(n = 165)		(n = 166)	
	Mean ±SD	Min-Max	Mean±SD	Min- Max	Mean± SD	Min- Max
Age (y)	8.7±0.47	7.7-10.6	9.72±0.49	8.6-11.6	10.72±0.48	9.7-12.6
Height (cm)	134.31±7.85	112.5-157.5	140.57±8.54	117.5-163.3	146.64±8.76	122.2-167.6
Weight (kg)	35.65±12.42	18.5-88.4	40.37±14.35	20-98.2	45.78±15.5	22.5-106.7
Body Mass Index (kg/m <sup>2</sup> )	19.36±4.81	12.6-39.4	20±5.2	13.1-39.5	20.88±5.22	12.6-38.8
Athletic Competence	3.12±0.67	1.17-4	3.19±0.82	1-4	3.24±0.76	1-4
PA Enjoyment	60.63±11.34	26-80	66.24±12.16	19-80	65.93±11.78	26-80
Attendance (%)	61.29±29.37	0-100	51.68 ±34.14	0-100	42.46±35.5	0-100
Intrinsic Motivation	-	-	-	-	11.08±1.41	4-12
Self-determined Extrinsic Motivation	-	-	-	-	10.17±1.93	4-12
Non-Self-determined Extrinsic Motivation	-	-	-	-	7.4±2.52	4-12
Amotivation	-	-	-	-	4.79±1.63	4-12

SDT Constructs as Predictors of Attendance in 5<sup>th</sup> Grade: Fifth grade youth with complete data were included in the analyses (Table 3). Age was a significant predictor of attendance in the overall sub-sample and girls, but not in boys, with older girls attending less frequently. Race was also associated with attendance in all sub-samples, with non-White youth attending less frequently than White youth. Baseline BMI, athletic competence, PA enjoyment, intrinsic motivation, and self-determined extrinsic motivation were not associated with attendance. Non-self-determined extrinsic motivation was a significant predictor of attendance in the overall sub-sample, and this effect was driven by girls, with higher levels of non-self-determined extrinsic motivation associated with higher attendance. Amotivation was not a

signification predictor in the overall sample, but it was in boys, with higher levels of amotivation associated with lower attendance.

**Table 2.** Results of ordinary least squares linear regressions by grade with percent program attendance as the dependent variable.

	All			3rd Grade			Females		
	B	SE	95% CI	B	SE	95% CI	B	SE	95% CI
Age (y) <sup>2*</sup>	-2.58 <b>-13.72</b>	4.24 <b>2.90</b>	-10.88-5.72 <b>-19.41--8.03</b>	- <b>-10.21</b>	- <b>4.05</b>	- <b>-18.16--2.26</b>	- <b>-17.53</b>	- <b>4.11</b>	- <b>-25.60--9.47</b>
Race <sup>3*</sup>	<b>-13.56</b>	<b>4.87</b>	<b>-23.11--4.01</b>	<b>-17.85</b>	<b>7.19</b>	<b>-31.95--3.75</b>	-10.76	6.55	-23.59-2.08
BMI (kg/m <sup>2</sup> ) <sup>4</sup>	0.22	0.45	-0.66-1.10	0.28	0.77	-1.22-1.79	0.10	0.54	-0.96-1.16
PA	-0.43	0.23	-0.89-0.02	-0.25	0.37	-0.97-0.47	-0.51	0.31	-1.13-0.10
Enjoyment <sup>5</sup>	-0.24	0.44	-1.11-0.62	-0.06	0.67	-1.37-1.24	-0.55	0.59	-1.71-0.61
Race X									
Enjoyment									
Athletic									
Competence <sup>6</sup>	3.77	3.88	-3.84-11.38	3.85	6.30	-8.49-16.19	3.14	5.04	-6.75-13.02
Race X									
Athletic	-5.67	7.27	-19.93-8.58	-8.56	11.43	-30.97-13.85	0.78	9.82	-18.48-20.03
Competence									
Constant	<b>45.55</b>	<b>5.11</b>	<b>35.54-55.57</b>	<b>47.98</b>	<b>5.37</b>	<b>37.45-58.51</b>	<b>40.31</b>	<b>6.07</b>	<b>28.42-52.20</b>

Coefficients in **bold** significant at  $p < .05$ ; <sup>1</sup> Male = 1; <sup>2</sup> Age in years, centered on the mean; <sup>3</sup> White = 1, non-White = 0; <sup>4</sup> Body Mass Index, centered on the mean; <sup>5</sup> PA enjoyment, centered on the mean; <sup>6</sup> Athletic Competence, centered on the mean. \*Age was associated with a 13.72% reduction in attendance and race was associated with a 13.56% reduction in attendance, where non-White children were less likely to attend.

	All			4th Grade			Females		
	B	SE	95% CI	B	SE	95% CI	B	SE	95% CI
Male <sup>1</sup>	2.20	4.89	-7.39-11.79	-	-	-	-	-	-
Age (y) <sup>2</sup>	<b>-12.87</b>	<b>2.53</b>	<b>-17.83--7.90</b>	<b>-10.24</b>	<b>3.38</b>	<b>-16.86--3.62</b>	<b>-16.76</b>	<b>3.72</b>	<b>-24.06--9.47</b>
Race <sup>3</sup>	<b>-17.35</b>	<b>5.49</b>	<b>-28.10--6.59</b>	<b>-16.41</b>	<b>8.23</b>	<b>-32.55--0.27</b>	<b>-18.29</b>	<b>7.27</b>	<b>-32.55--4.04</b>
BMI (kg/m <sup>2</sup> ) <sup>4</sup>	0.85	0.51	-0.15-1.85	1.45	0.79	-0.10-3.00	0.31	0.65	-0.97-1.58
PA	-0.24	0.25	-0.73-0.25	-0.43	0.37	-1.15-0.30	-0.09	0.32	-0.73-0.54
Enjoyment <sup>5</sup>	-0.24	0.25	-0.73-0.25	-0.43	0.37	-1.15-0.30	-0.09	0.32	-0.73-0.54
Race X									
Enjoyment	-0.02	0.49	-0.98-0.95	0.23	0.71	-1.16-1.63	0.09	0.69	-1.25-1.44
Athletic									
Competence <sup>6</sup>	-0.85	4.21	-9.10-7.39	-0.36	6.91	-13.90-13.18	-2.96	5.12	-12.99-7.07
Race X									
Athletic	2.03	6.60	-10.90-14.96	8.93	9.82	-10.31-28.17	-6.28	9.23	-24.37-11.81
Competence									
Constant	<b>52.40</b>	<b>4.26</b>	<b>44.05-60.74</b>	<b>54.66</b>	<b>4.56</b>	<b>45.73-63.60</b>	<b>52.60</b>	<b>4.56</b>	<b>43.67-61.54</b>

Coefficients in **bold** significant at  $p < .05$ ; <sup>1</sup> Male = 1; <sup>2</sup> Age in years, centered on the mean; <sup>3</sup> White = 1, non-White = 0; <sup>4</sup> Body Mass Index, centered on the mean; <sup>5</sup> PA enjoyment, centered on the mean; <sup>6</sup> Athletic Competence, centered on the mean. \*Age was associated with a 12.87% reduction in attendance and race was associated with a 17.35% reduction in attendance, where non-White children were less likely to attend.



	All			5th Grade Males			Females		
	B	SE	95% CI	B	SE	95% CI	B	SE	95% CI
Male <sup>1</sup>	-3.76	5.03	-13.62-6.11	-	-	-	-	-	-
Age (y) <sup>2*</sup>	<b>-7.93</b>	<b>2.07</b>	<b>-11.98--3.88</b>	<b>-3.06</b>	<b>2.88</b>	<b>-8.71-2.59</b>	<b>-12.78</b>	<b>2.85</b>	<b>-18.36--7.21</b>
Race <sup>3*</sup>	<b>-21.53</b>	<b>6.02</b>	<b>-33.33--9.72</b>	<b>-24.41</b>	<b>8.18</b>	<b>-40.44--8.38</b>	<b>-20.81</b>	<b>8.33</b>	<b>-37.14--4.48</b>
BMI (kg/m <sup>2</sup> ) <sup>4</sup>	0.30	0.52	-0.71-1.32	-0.08	0.74	-1.52-1.37	0.98	0.64	-0.27-2.23
PA Enjoyment <sup>5</sup>	-0.08	0.25	-0.58-0.41	0.01	0.32	-0.60-0.63	-0.04	0.37	-0.77-0.69
Race X Enjoyment	-0.33	0.55	-1.40-0.74	-1.24	0.72	-2.66-0.18	0.58	0.75	-0.90-2.06
Athletic Competence <sup>6</sup>	1.99	4.13	-6.11-10.09	-3.81	7.20	-17.92-10.31	6.74	4.59	-2.25-15.73
Race X Athletic Competence	-10.12	7.18	-24.18-3.95	-6.31	10.76	-27.40-14.78	-17.46	9.53	-36.15-1.22
Constant	<b>54.93</b>	<b>5.77</b>	<b>43.63-66.23</b>	<b>47.17</b>	<b>5.96</b>	<b>35.48-58.86</b>	<b>58.95</b>	<b>7.72</b>	<b>43.82-74.09</b>

Coefficients in **bold** significant at  $p < .05$ ; <sup>1</sup> Male = 1; <sup>2</sup> Age in years, centered on the mean; <sup>3</sup> White = 1, non-White = 0; <sup>4</sup> Body Mass Index, centered on the mean; <sup>5</sup> PA enjoyment, centered on the mean; <sup>6</sup> Athletic Competence, centered on the mean. \*Age was associated with a 7.93% reduction in attendance and race was associated with a 21.53% reduction in attendance, where non-White children were less likely to attend.

## DISCUSSION

The purpose of this study was to examine if enjoyment, athletic competence, and intrinsic motivation predict youth attendance at the FitKid afterschool PA program. Overall few psychological constructs were associated with attendance in this study. Neither PA enjoyment nor athletic competence predicted attendance. Amotivation was negatively associated with attendance of boys in 5<sup>th</sup> grade, while non-self-determined extrinsic motivation was positively associated with attendance of girls during the 5<sup>th</sup> grade. No other motivational constructs were associated with attendance. These findings are in contrast to previous studies (3, 15, 41). Baron and Downey found both perceived success and enjoyment were associated with children's greater functional attributions, and in turn increased performance of activities, in their PE classes (3). Dishman, Motl, Saunders, and Felton found enjoyment partially mediated the positive effect of increased PA levels in the Lifestyle Education for Activity Program (LEAP) (15). Although the students in this program were older, mean age of 13.6 years, than the participants in this study (15). Sebire and colleagues assessed if SDT constructs were associated with PA levels among on 462 children in 5<sup>th</sup> and 6<sup>th</sup> grade (41). They found that only intrinsic motivation was associated with children's objective PA levels (41).

The findings for non-self-determined extrinsic motivation likely reflect the participants' awareness of social cues from others encouraging participation in an afterschool PA program, or direct parental influence on afterschool activity choices beyond the students' control. Studies have indicated that parents restrict opportunities for their children to be physically active based on concerns of crime, traffic, and other safety issues in their local neighborhoods

or schools (7, 9, 20, 25, 30). Since parents believe it is unsafe for their children to go outside to be physically active, then they are more likely to prevent their children from being able to play or participate in sports (7, 9, 20, 25, 30). Conversely, since FitKid provided a safe, supervised environment for the children to be physically active, parents might have been more encouraging of their child to attend the program, especially girls whose parents might have heightened concerns (11).

**Table 3.** Results of ordinary least squares linear regressions in 5th grade with percent program attendance as the dependent variable.

	All (n = 166)			Males (n = 82)			Females (n = 84)		
	B	SE	95% CI	B	SE	95% CI	B	SE	95% CI
Male <sup>1</sup>	-3.92	5.00	-13.72-5.89	-	-	-	-	-	-
Age (y) <sup>2*</sup>	<b>-7.80</b>	<b>2.07</b>	<b>-11.86--3.75</b>	-2.34	2.90	-8.02-3.34	<b>-13.20</b>	<b>2.85</b>	<b>-18.79--7.61</b>
Race <sup>3*</sup>	<b>-21.45</b>	<b>5.99</b>	<b>-33.19--9.72</b>	<b>-26.64</b>	<b>8.09</b>	<b>-42.49--10.79</b>	<b>-23.13</b>	<b>8.45</b>	<b>-39.68--6.57</b>
BMI (kg/m <sup>2</sup> ) <sup>4</sup>	0.56	0.51	-0.45-1.56	0.57	0.74	-0.88-2.02	1.02	0.63	-0.21-2.25
Athletic Competence	-2.15	3.54	-9.09-4.78	-8.98	5.50	-19.75-1.79	2.65	4.10	-5.39-10.69
PA Enjoyment	-0.27	0.32	-0.89-0.36	-0.42	0.38	-1.18-0.33	-0.13	0.54	-1.18-0.93
Intrinsic Motivation <sup>5</sup>	-2.10	2.58	-7.16-2.97	-4.84	3.46	-11.61-1.94	1.08	3.91	-6.58-8.75
Self-determined Extrinsic Motivation <sup>5</sup>	-0.07	2.07	-4.12-3.99	0.41	3.04	-5.54-6.36	-1.47	2.82	-7.01-4.06
Non-Self-Determined Extrinsic Motivation <sup>5*</sup>	<b>2.54</b>	<b>1.12</b>	<b>0.36-4.73</b>	2.05	1.67	-1.22-5.32	<b>3.07</b>	<b>1.45</b>	<b>0.22-5.92</b>
Amotivation <sup>5</sup>	-2.79	1.96	-6.64-1.06	<b>-5.55</b>	<b>2.39</b>	<b>-10.23--0.87</b>	-1.17	3.36	-7.76-5.43
Constant	55.18	6.11	43.22-67.15	47.20	6.11	35.22-59.18	60.32	8.39	43.87-76.77

Coefficients in **bold** significant at  $p < .05$ ; <sup>1</sup> Male = 1; <sup>2</sup> Age in years, centered on the mean; <sup>3</sup> White = 1, non-White = 0; <sup>4</sup> Body Mass Index, centered on the mean; <sup>5</sup> Psychosocial constructs, centered on the mean. UC = Unstandardized Coefficients; SE = Standard error, CI = Confidence interval \*Age was associated with a 7.80% reduction in attendance and race was associated with a 21.45% reduction in attendance, where non-White children were less likely to attend. Non-self-determined extrinsic motivation was associated with a 3.07% increase in attendance in girls. Amotivation was associated with a 5.55% reduction in attendance in boys.

In this study we were only able to test the relationship between motivation for PA and attendance during the 5<sup>th</sup> grade. As such, it is unclear if motivation is not relevant to program attendance in younger children or if motivational constructs are simply not salient in younger children, or both. The relationship between motivation and attendance could not be tested in the 3<sup>rd</sup> and 4<sup>th</sup> grade years of the program due to inadequate construct validity of the PMS in the 3<sup>rd</sup> and 4<sup>th</sup> grade youth. The tool was originally developed for adolescents with an intellectual disability, and therefore the poor psychometric properties of the PMS might be due to a lack of reading comprehension among young children (10, 19). Or the lack of abstract reasoning (54). Since evidence for validity of other pictorial scales has been reported by other

authors, the latter (abstract reasoning) is supported, but a lack of reading comprehension cannot be ruled out in young children. Dishman and colleagues noted in their study that the level of intrinsic motivation for PA in children became more apparent between the 6<sup>th</sup> and 7<sup>th</sup> grade, and that the effects of motivation on PA became stronger (14). Since the participants in this study were considerably younger, it is plausible that they too young to have developed intrinsic motivation for PA or the autonomy to act upon it. Future studies are warranted to determine the developmental trajectory for PA motivation and its relevance to PA and/or attendance.

In addition, White youth were more likely to attend the program throughout the intervention than non-White youth. Although individual-level SES was not available in the present study, we determined the proportion of students eligible for free/reduced lunch and the proportion of students belonging to a minority group at each school from using public-access databases (56). Non-White students were significantly more likely to be eligible for free or reduced lunch, have greater access to PA facilities within 0.5-mile distance from their residence, and were more likely to attend school in urban areas than White students (56). Therefore it is possible that race and ethnicity were confounded with socioeconomic status (SES) (26). For example, it has previously been reported that differences in physical inactivity rates by racial and ethnic groups were less evident after adjusting for SES (27). It is not clear why children from lower SES backgrounds would be less likely to participate in a free PA program than children from higher SES backgrounds. It could be a combination of behavioral and socio-cultural factors. For example some investigators have suggested that parents' with higher educational attainment are more likely to be active than their peers with lower educational attainment, and their children in turn are more likely to model health behavior and PA habits from an early age (29). Additionally, children lower SES backgrounds may spend more time doing sedentary activities like television viewing (16). However, since individual level family income was not collected, this can't be confirmed or denied in the present sample.

To our knowledge, this is the only study to examine if PA enjoyment, athletic competence, and motivation predict program attendance in an afterschool PA program. However, this study had limitations. First, data were not collected to assess why children enrolled in the program in the first place, nor for reasons of discontinuation. Second, although school buses were used to transport children to the program to overcome transportation barriers. The bussing was costly and logistically challenging for school officials, resulting in long rides home for students (48). This could be one reason for reduced attendance rates with increasing age, since some children might have time constraints to return to home in a timely manner and other out of school programs became available as they advanced in grade. Third, since children could join and discontinue from the program freely at any time, there were limited longitudinal data on children who attended the program regularly for all 3 years, which necessitated testing relationships by year. Fourth, the lack of motivation data from the 3<sup>rd</sup> and 4<sup>th</sup> grade years limited our ability to definitively assess the effect of motivation on program attendance. As noted before, it is possible that the SDT constructs are simply not understood by children this young due to a lack of abstract reasoning (54). Fifth, not collecting data on participants' individual-level family income makes it unclear if SES cofounded the findings between race

and attendance. Finally, it is not clear if the sample is generalizable to other school aged populations outside of Georgia.

In summary, neither enjoyment nor athletic competence was associated with attendance rates, but amotivation (negatively in boys) and non-self-determined extrinsic motivation (positively in girls) were associated with attendance during the 5<sup>th</sup> grade. The lack of significant effects for previously identified determinants of PA may suggest that attendance in an afterschool program is associated with factors outside of the child's control that need to be identified and targeted for intervention. Furthermore, assessing student motivation for PA prior to programming may be helpful in identifying those at risk for attrition, specifically girls who may be at risk for sub-optimal attendance. Future studies need to examine potential economic and/or cultural differences regarding the association between the various psychosocial constructs and participation in PA programs.

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