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Process Evaluation of an Intervention to Increase Child Activity Levels in Afterschool Programs

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Abstract

Background—Identifying effective strategies in Afterschool programs (ASPs) to increase children's moderate-to-vigorous physical activity (MVPA) in the ASP setting is crucial. This study describes the process evaluation outcomes from an intervention to reduce child sedentary time and increase MVPA in ASPs.

Methods—Four ASPs participated in a quasi-experimental single-group pre-post study targeting child sedentary time and MVPA. The strategies implemented to help ASPs meet Physical Activity Standards consisted of detailed schedules, professional development trainings, on-site booster sessions, and technical assistance. Process evaluation related to staff behaviors was collected via systematic observation to identify the interventions impact on the physical and social environment of the ASP. Random-effects regression models examined the impact of the intervention on boys/ girls observed sedentary behavior, MVPA, and changes in staff behaviors.

Results—Increases in MVPA and reductions in sedentary behavior were observed during enrichment, academics, organized and free-play physical activities (PA). Corresponding changes in staff behaviors were observed during these ASP contexts. For example, staff reduced child idle-

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time during organized PA (38.9%-1.8%) and provided energizers more often during enrichment (0.2%-11.5%).

Conclusions—This study identified changes in staff behavior during ASP contexts that led to increases in child MVPA and decreases in child sedentary behavior.

Keywords

Community; physical activity; out-of-school-time

Introduction

Afterschool programs (ASPs) serve more than 8.4 million children nationwide (Afterschool Alliance, 2009), and can contribute to children's daily accumulation of health enhancing physical activity (PA) (Beets, 2012; Beets, Webster, Saunders, & Huberty, 2013) because of their substantial reach and structured environment (Beighle, et al., 2010). Subsequently, standards that target the amount of PA children engage in during ASPs have been developed and adopted by local, state and national organizations (Beets, Wallner, & Beighle, 2010). These standards call for children to accumulate 30 to 60 minutes of moderate-to-vigorous physical activity (MVPA) and limit the amount of time children spend sedentary while attending ASPs (Beets et al., 2010b). However, initial research indicates ASPs struggle to limit child sedentary time and provide children with sufficient amounts of PA (Beets, Huberty, et al., 2013; Beets et al., 2010a). This gap between standards and practice suggests that ASPs need additional support if children are to achieve the levels of PA called for in ASP standards.

Studies have sought to increase children's PA in ASPs (Dzewaltowski et al., 2010; Gortmaker, et al., 2012; Iversen, Nigg, & Titchenal, 2011; Nigg, Battista, Chang, Yamashita, & Chung, 2004; Robinson et al., 2010; Sharpe, Forrester, & Mandigo, 2011). Intervention components used in these studies include: tailoring ASP activities to the participant population (Robinson et al., 2010), scheduling more time for PA opportunities during the program (Gortmaker et al., 2012; Mozaffarian et al., 2010), and implementing new curricula such as the CATCH Kids Club (Dzewaltowski et al., 2010; Sharpe, et al., 2011). However, these studies have demonstrated mixed results with some increasing child PA slightly (Dzewaltowski et al., 2010; Gortmaker et al., 2012; Sharpe et al., 2011), some reporting no change in child PA (Iversen et al., 2011; Nigg et al., 2004) and one even reporting a decrease in child PA (Robinson et al., 2010). Many of the successful and unsuccessful studies incorporated similar intervention components for promoting child PA (Beets, 2012), making interpretation of components difficult. It is essential to understand what components within an intervention lead to increases in child MVPA. Perhaps an important consideration is the distinction between the way a program is delivered (i.e., what staff do) and the program itself (i.e., the curriculum). The staff shapes both the physical (structure the PA setting) and social environments (staff interactions with youth). This perspective requires a comprehensive approach to promoting child PA in ASPs.

Recently, one study adopted a comprehensive approach to increasing child PA levels (Beets, et al., in review; Weaver, Beets, Saunders, Beighle, & Webster, in press). Founded in the

principles of community based participatory research (Israel, Schulz, Parker, & Becker, 1998), a systems framework (Foster-Fishman, Nowell, & Yang, 2007), and public health policy literature (Brownson & Jones, 2009; Brownson, Seiler, & Eyler, 2010), a collaborative partnership between the YMCA of Columbia and the University of South Carolina implemented and evaluated PA standards in four YMCA ASPs. The collaborative team developed a comprehensive set of strategies (i.e., intervention components) for meeting the YMCA's PA Standards, which called for children to accumulate a minimum of 30 minutes of MVPA daily during the ASP. The core strategy of the collaborative team was a theoretically and empirically based (Weaver, Beets, Webster, Beighle, & Huberty, 2012) professional development training program focused on physical and social environmental elements identified as primary barriers to increasing children's PA in ASPs. These elements were operationalized in the trainings as the LET US Play principles, which stand for removal of lines, eliminating elimination, reducing team size, identifying uninvolved staff and children, and modifying space, equipment and rules to increase child PA. Findings indicated that changes in staff behaviors consistent with the LET US Play principles (e.g., reduction in elimination games) occurred from baseline to post-assessment (range 11% decrease in staff discouraging behaviors to a 14% increase in staff promoting behaviors) (Beets, et al., in review; Weaver, et al., in press), as did an increase in the overall percentage of girls (9.2% increase) and boys (15.9% increase) meeting the PA standard during ASPs.

The next step to further understanding the success of the professional development training program is identifying the ASP contexts (e.g., academics, PA) in which ASP staff utilized the skills learned in professional development training, and how these social and physical environmental changes translate into changes in child PA levels. Identifying where ASPs can successfully increase children's PA and what staff behaviors are driving these changes will allow practitioners and researchers to refine strategies to meet current PA standards. The two-fold purpose of this study, therefore, was to identify (a) the ASP contexts in which the staff implemented the behaviors learned in professional development training (i.e., effected physical and social environmental changes) and (b) the corresponding changes in child PA observed during those ASP contexts.

Methods

Setting and Participants

Approximately 500 children ages 5 to 12 years old were enrolled across the four ASPs. Programs maintained a 1:10 staff to child ratio employing approximately 50 staff across all sites. The programs operated from Monday through Friday weekly. Start times ranged from 2:15pm to 3:30pm and finished between 6pm and 6:30pm. The average duration of the participant ASP sites was 3 hours (range 2.5 – 3.75 hours). The programs operated on similar schedules that included time allocated for snack, enrichment (e.g., crafts, puzzles, board games, drawing), academics (i.e., time designated specifically to academic work related to school), and physical activities (i.e., activities that require bodily movement such as sports or playground time), referred to as ASP contexts throughout this manuscript. Each program had access to both indoor (e.g., gym) and outdoor (e.g., fields) facilities. All

children in attendance were invited to participate in the study with the only exclusion criteria being the inability to move without an assistive device.

Intervention Components: Comprehensive and Coordinated Approach

Physical Activity Standards—In 2011, the YMCA of USA and the four participating YMCAs adopted PA standards aimed at creating PA-promoting ASP environments (Wiecha, Gannett, Hall, & Roth, 2011). The four participant sites used these standards to guide their efforts to increase the PA of children attending their ASPs. Specifically, the sites called for all children in attendance to accumulate 30 minutes of MVPA each day (Beets et al., 2010b), for staff to display PA promotion behaviors (e.g., verbal promotion) and refrain from PA discouraging behaviors (e.g., withholding PA as punishment) and for staff to receive annual training in order to develop competencies related to these behaviors (Wiecha et al., 2011).

Professional development training—All ASP staff at all sites participated in a one-day professional development training in January 2012. The session introduced PA promotion and management strategies to help frontline staff facilitate active ASP environments. The professional development training utilized the 5Ms (Mission, Manage, Motivate, Monitor, Maximize) training model to teach staff core competencies needed (Weaver et al., 2012). Within the 5Ms model, the LET US Play principles provided a framework for staff to examine elements of games and activities that limit PA. Members of the research team with expertise in the skills underpinning the training model led trainings.

Scheduling adjustments—The collaborative team identified detailed schedules as a useful tool to enable more opportunities for MVPA. Existing ASP schedules did not provide detailed direction for frontline staff leading activities, listing only times and general descriptions of what activities should be provided in various locations within each ASP context (e.g., games on the field, crafts in the classroom). Without clear direction, staffers were observed using excessive time to facilitate activities, leading to child idle-time (i.e., children waiting for direction from staff with no specific game/activity in which to engage). The schedules developed for the intervention consisted of clearly indicated activities to be played, equipment necessary to facilitate the activities, modifications to the activities that would increase child PA, and staff members who would be facilitating the activities.

On-site booster sessions—Each site received 3 booster sessions prior to the post-assessment in April and May 2012. At each booster session, ASP directors and members of the university research team walked through the ASP to identify the strengths of the program as well as areas where staff needed additional support. Research personnel provided feedback to program leaders and frontline staff regarding the PA standards during the walk-through and set site specific goals related to PA standards.

Ongoing technical assistance—Throughout implementation, university research staff made weekly contact with program leaders in order to provide ongoing technical assistance including additional PA resources (e.g., strategies for overcoming barriers) and suggestions to continue to enhance PA.

Observation Schedule and Protocol

Two systematic observation systems were utilized to evaluate the context-specific changes in staff behaviors and child PA levels. (McKenzie, 2002). The System for Observing Staff Promotion of Physical Activity and Nutrition (SOSPAN) was used to collect data on context of the program and staff behaviors (Weaver, Beets, Webster, & Huberty, 2014 while the System for Observing Physical and Leisure Activity in Youth (SOPLAY) was used to capture child PA levels (McKenzie, Marshall, Sallis, & Conway, 2000).

Systematic observations took place at each participating ASP site on four unannounced, nonconsecutive weekdays (Monday -Thursday) at baseline (August-October 2011) and post-assessment (April-May 2012) (Dzewaltowski, et al., 2010; Herrick, Thompson, Kinder, & Madsen, 2012; Weaver et al., 2014). Baseline data were collected over 23 program days; post-assessment data were collected over 21 program days. Prior to data collection, and consistent with SOPLAY and SOSPAN protocol, each site was visited to identify areas in which child PA could occur (i.e., target areas). A total of 91 target areas were identified across the four participating ASPs.

On each observation day, two researchers collected data at a participant ASP. Systematic observations were completed by both researchers for the entirety of the ASP. A total of 5 trained researchers collected data. Due to the number of children in attendance, programs divided children by activity tracks or grade level. Activity tracks are activities from which children could choose daily (e.g., crafts, field games) and last approximately 45-60 minutes. If the program divided children by activity tracks, observers systematically rotated through activity tracks. If the program divided children by grade level (i.e., k-1, 2-3, 4-5), observers systematically rotated through the scheduled activities of each grade level. Five consecutive scans were completed in each target area before moving to the next target area. No observations were made in target areas where children were not present.

Consistent with established protocols, inter-rater reliability was established via interval-by-interval agreement for each category (Weaver et al., 2014; McKenzie, Marshall, Sallis, Conway, 2000; Ridgers, Stratton, & McKenzie, 2010). Agreement criteria were set at > 80%. Reliability scans were conducted prior to data collection and on at least 30% of data collection days. Percent agreement ranged from 84-100 percent for the included variables.

Instrumentation

SOSPAN—The System for Observing Staff Promotion of Activity and Nutrition (SOSPAN) is a momentary-time sampling observational tool utilized to perform process evaluation in regards to staff behaviors and promotion of PA (Weaver et al., 2014). The instrument is composed of several observational scans measuring aspects such as staff promotion behaviors (i.e., verbal promotion) and activity context (i.e., organized PA). SOSPAN also examines staff management behaviors that may serve as facilitators or barriers to children accumulating PA, such as small-sided games (facilitator) or children waiting in line for their turn (barrier) that correspond with the LET-US Play principles taught to staff during professional development training. This tool is reliable and valid

(Weaver et al., 2014). Observer SOSPAN training was conducted alongside SOPLAY training.

SOSPAN Scans—A complete SOSPAN scan consisted of seven sub-scans involving three staff behavior sub scans (i.e. staff PA promotion, staff engaged in PA with children), two staff management sub scans (e.g. small sided games, children eliminated, children stand and wait-in-line for turn) and two context sub-scans (i.e. scheduled activity, the grade level of children observed, location of activity, equipment available) and were completed during all scheduled activities, including snack/lunch. Scans were broken into sub-scans due to the breadth of the variables observed. A complete SOSPAN scan, including all sub-scans, took approximately three minutes. All scans were completed from the right-to-right of all target areas and then the appropriate variables were coded before continuing to the next sub-scan.

SOPLAY—This tool utilizes a momentary time sampling approach to systematically observe children's PA levels (i.e., sedentary, walking and vigorous) in recreational settings (McKenzie, et al., 2000). Following SOPLAY protocol, researchers scanned target areas where children were located from right to right. During the scan, researchers coded boys' and girls' PA levels as sedentary, walking, or vigorous. SOPLAY scans were completed at the completion of each SOSPAN scan, and scans were completed throughout the entirety of the ASP. In the context of this study, vigorous PA as detected by SOPLAY was coded as MVPA (Saint-Maurice, Welk, Ihmels, & Krapfl, 2011). The PA variables used in SOPLAY are valid (McKenzie, et al., 1991) and have been used extensively in previous research (McKenzie, 2002; McKenzie, Cohen, Sehgal, Williamson, & Golinelli, 2006; McKenzie et al., 2001).

Analysis

Staff behaviors were analyzed in the contexts targeted by the professional development training (i.e., free-play PA, organized PA, enrichment and academics). Consistent with previous research (Weaver et al., 2014), observations of staff behaviors via SOSPAN were transformed into the percent of total scans a behavior was observed overall and during each ASP context separately (e.g., the number of scans containing a staff behavior divided by the total number of scans completed). Observations of the number of boys and girls in each SOPLAY PA category were transformed into the percent of children observed in a category (e.g., number of boys or girls sedentary divided by the total number of boys or girls observed). Random-effects regression models examined changes in staff behaviors separately in the four ASP contexts included in the intervention (i.e., organized and free-play PA, academics and enrichment). Subsequent analysis was completed to determine changes in overall child PA levels and then by each ASP context separately. Changes over time in staff behaviors and child PA levels were examined using random-effects regression models (i.e., staff behaviors expressed as a percentage of the number of scans observed). All analyses were completed using STATA (v.12.0, College Station, TX).

Results

Changes in Staff Behaviors by Activity Type

Changes in staff behaviors from baseline to post-assessment during each ASP context are presented in Table 1.

Free-play PA—A total of 661 staff behavior scans were collected during free-play PA across baseline and post-assessment. During free-play PA, staff increased verbal PA promotion by 8.3% and engaging in PA with children by 10.3%. Staff decreased the amount of time that PA was withheld as a consequence of misbehavior by 5.4%. The time children spent waiting for direction from staff during free-play PA decreased by 24.3%. Staff increased the amount of small games (less than 10 children) by 25.6% and decreased the instances that sedentary equipment (i.e., board games) was available by 21.1%.

Organized PA—A total of 1,565 staff behavior scans were collected during organized PA from baseline to post-assessment. Statistically significant increases in staff verbally promoting PA (8.1%) were observed while staff discouraging PA (-3.6%) and withholding PA as a consequence of misbehavior was observed less often (-6.2%). Children standing in line (-19.6%), playing elimination games (-14.9%), and idle-time (-27.1%) were lower at post-assessment compared to baseline. There was more active equipment available to the children during organized PA at post-assessment (11.8%).

Enrichment and academics—A total of 910 and 809 staff behavior scans were collected during enrichment and academics, respectively. At post-assessment, staff increased leading or instructing PA in both enrichment (6.1%) and academics (2.5%). Staff were also observed verbally promoting PA more often during enrichment (3.1%) and academics (3.3%) at post-assessment. During enrichment staff was observed engaging in PA (6.0%) more often and staff also managed environments to decrease child idle-time (-27.3%). At post-assessment, an increase of staff leading energizers (i.e. active game to interrupt long sedentary periods) was observed during both enrichment (11.3%) and academics (5.8%). In addition to staff behaviors, the number of scans that sedentary equipment was observed decreased during enrichment by 17.9% from baseline to post-assessment.

Child PA Levels

A total of 4,648 SOPLAY scan were collected across baseline and post-assessment with 2,211 SOPLAY scans collected during scheduled PA time. Changes in PA levels throughout all ASP contexts and during scheduled PA are presented in Table 2. At baseline, 16.6% and 11.7% of boys and girls, respectively, were engaged in MVPA during scheduled PA time. At post-assessment, boys and girls engaged in MVPA during scheduled PA time increased to 20.0% and 17.3%, respectively, representing a 3.4% and 5.6% increase. Throughout the entire program (i.e. all scheduled activities including PA), boys and girls increased MVPA levels by 4.9% and 5.1%. Boys and girls also reduced sedentary behaviors at post-assessment throughout the program (-11.4% and -9.7%) and during scheduled PA time (-9.4% and -9.0%).

Child Physical Activity Levels by Scheduled Activity Type

Child PA levels during each ASP context are presented in Table 3. The largest changes in both MVPA and sedentary behavior for boys and girls occurred during free-play PA, organized PA, and enrichment. There was also a slight increase in boys (3.0%) and girls (2.1%) observed in MVPA during academics. During free-play PA, boys and girls increased their MVPA (8.4%, 6.0%) and decreased sedentary behaviors (-9.3%, -8.8%). Similarly, during enrichment time, boys and girls increased MVPA (4.0%, 3.1%) and decreased sedentary behavior (-7.0%, -6.4%). During organized PA time, both boys and girls decreased sedentary behaviors (-11.2%, -13.0%); girls increased MVPA (5.4%) during this context.

Discussion

A comprehensive coordinated intervention was developed to increase child PA levels through enhancing the skills of staff related to facilitating PA opportunities by structuring the physical and social environment of their ASP. During specific ASP contexts, child PA levels increased when staff structured the environment by increasing appropriate social behaviors (i.e., engaging in activities with children and leading energizers during academics) and improved program structure (i.e., decreasing lines in activities). Based on these analyses, it appears professional development training was effective at increasing the skills of staff related to creating PA-promoting ASP environments, and that these changes led to improvements in children's MVPA and sedentary behaviors during targeted ASP contexts.

A large reduction of child sedentary time was seen from baseline to post-assessment during free-play PA, organized PA, and enrichment. These changes may be attributed to the modifications in the physical and social environment of the ASP, specifically a result of the detailed schedules that indicated: game to be played, necessary equipment, location and staff roles. By eliminating ambiguity from the schedule, staffers were able to transition to games more quickly leading to less child idle-time. This may also be one strategy that can increase child PA levels. This finding is supported by research (Byra & Coulon, 1994) in physical education suggesting that detailed scheduling leads to less time standing in line and more time on task. It is clear that these components of the comprehensive and coordinated approach do have an impact on physical and social environment of the ASP and child PA levels.

Other interventions have focused on adherence to curriculum changes as the process evaluation measure (Dzewaltowski et al., 2010; Sharpe et al., 2011). These studies reported modest (Dzewaltowski et al., 2010) or no (Sharpe et al., 2011) increases in child PA during program time. In fact, one study (Sharpe et al., 2011) reported children spent more time in PA at the control sites than at the intervention sites (64.2% vs. 59.3%). Not surprisingly, limited implementation of the intervention program was reported from the program leaders (Sharpe et al., 2011). Not offering the curriculum daily as well as allowing children to choose less active options limits children's exposure to the intervention and the impact on child PA levels. Further, some staff members reported not delivering curriculum components (i.e., active games) because they did not understand the games or feel they possessed skills to lead said games (Sharpe et al., 2011). These challenges are common in

curriculum-based PA interventions and indicate that asking staff to deliver a new curriculum may be more difficult than demonstrating a set of skills learned during professional development training. In contrast to curriculum-based PA interventions, the comprehensive approach in this study focused on the ASP staff role in structuring the physical and social environment to promote PA and provided specific training to enable staff to create a PA-promoting environment.

Lessons Learned

Behavior changes for staff and children were captured through a rigorous approach to process evaluation that utilized systematic observation to assess staff implementation of the strategies presented in professional development trainings in each ASP context. This approach allowed for a detailed understanding of which behaviors lead to increases in child PA levels.

The strength of this study lies in the use of systematic observation to examine staff behaviors within each ASP context and corresponding increases in child PA. This information allows for ASP leaders to focus staff trainings on creating PA promoting ASP environments tailored to different ASP contexts. The collaborative partnership between university and community personnel is also a strength of this study. This approach allowed community members to participate in the development of strategies to increase PA within their organization and may lead to increased adoption, implementation, and sustainability of strategies (Green & Glasgow, 2006). The fact that these strategies were low to no cost (e.g., scheduling changes; staff demonstrating behaviors) is also a major strength of this study.

Limitations

When interpreting the results some limitations of the study must be taken into consideration. The one-group design is subject to several threats to internal validity, including history and testing in which external events (i.e., secular trends) and effects of testing, respectively, could potentially account for outcomes. However, these changes are difficult to make and are unlikely to have occurred spontaneously due to secular trends or exposure to the concepts. It is also possible that organizations participating in the study had high level of commitment that could influence outcomes, though the multi-level nature of the study makes this somewhat less likely. These results apply primarily to the staff and organizations participating in this study and should be generalized cautiously to other settings. Further, the SOPLAY instrument is valid and reliable, but it does not provide an estimation of accumulated minutes of PA for individual children. Use of PA measures that provide accumulated MVPA estimates (e.g., accelerometers) may provide a better evaluation of the PA Standards. Further, shared method variance must be considered as a possible confounder to the results since data on child PA and staff behaviors were both collected through systematic observation (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

In conclusion, the detailed process observation conducted in this study supports the utility of providing training to ASP staff to engage in behaviors that create PA-promoting ASP environments that are, in turn, associated with increased child MVPA and decreased child sedentary time.

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Biographies

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Dr. Collin Webster is an Associate Professor at University of South Carolina in the Department of Physical Education and Athletic Training. Dr. Webster received his Ph.D. in Physical Education and Sport Studies from the University of Georgia. His interests are school and afterschool physical activity promotion, instructional communication, expert teaching, and autonomy supportive teaching and coaching.

Dr. Michael Beets is an Associate Professor at University of South Carolina in the Department of Exercise Science. Dr. Beets is also the Graduate Director for the Master's of Public Health in Physical Activity at the University of South Carolina. He received his Ph.D. in Health Education and Behavior Change from Oregon State University. He also received both his Master's of Public Health and Master's of Education in Exercise Science from Wichita State University in Kansas. Dr. Beets' main area of interest is promotion of youth physical activity and dietary behaviors.

Highlights

- A comprehensive and coordinated approach can increase child physical activity levels and decrease child sedentary behavior in afterschool programs.
- Intervention strategies were low to no-cost for the afterschool organization and with further implementation, may lead to sustainable increases in child physical activity.
- Systematic observation is an effective process measure to evaluate changes in the physical and social environments for afterschool program contexts and how these changes increase child activity levels.
- The afterschool program contexts where significant changes in staff behaviors were observed were Organized Physical Activity, Free-Time Physical Activity, and Enrichment. Corresponding significant increases were observed for child activity levels during contexts where staff behavior changes were detected.

Table 1

Changes in staff behaviors observed via SOSPAN during Free-Play, Organized PA, Enrichment and Academics ASP context.

	Free-Play (N=661 scans)			Organized PA (N=1565 scans)			Enrichment (N=910 scans)			Academics (N=809 scans)		
	Fall 2011	Spring 2012	95% CI	Fall 2011	Spring 2012	95% CI	Fall 2011	Spring 2012	95% CI	Fall 2011	Spring 2012	95% CI
Staff Behavior												
Staff engaged in tasks other than supervising children	26.2	23.5	-2.8 (-11.0, 5.5)	8.9	17.8	9.0 (3.0 15.0)	18.5	16.7	-1.8 (-11.8, 8.2)	13.9	25.3	11.3 (0.9, 21.8)
Staff engaged in behaviors unrelated to their job	5.4	2.0	-3.4 (-8.4, 1.5)	1.1	0.7	-0.3 (-1.4 0.7)	2.5	1.6	-0.9 (-4.0, 2.1)	0.7	0.2	-0.5 (-1.5, 0.5)
Staff leading or instructing physical activity	0.3	1.3	1.0 (-0.3, 2.4)	23.2	21.0	-2.3 (-9.2 4.6)	0.4	6.6	6.1 (2.1, 10.2)	0.5	3.0	2.5 (0.4, 4.6)
Staff verbally promoting physical activity	1.5	9.8	8.3 (3.8, 12.7)	5.8	13.9	8.1 (3.6 12.7)	0.5	3.5	3.1 (0.5, 5.7)	0.3	3.6	3.3 (1.3, 5.4)
Staff verbally discouraging physical activity	6.5	1.8	-4.7 (-9.6, 0.2)	4.7	1.1	-3.6 (-5.7 -1.4)	2.6	2.6	-0.1 (-2.7, 2.6)	4.9	3.0	-1.9 (-4.9, 1.1)
Frontline staff engaged in physical activity with children (i.e. playing the game)	22.6	32.9	10.3 (0.9, 19.7)	34.2	38.5	4.3 (-3.9 12.4)	1.6	7.6	6.0 (1.4, 10.7)	1.0	2.8	1.8 (-0.5, 4.2)
Withholding physical activity as a consequence of misbehavior	5.4	0.0	-5.4 (-8.0, -2.8)	6.5	0.4	-6.2 (-10.1 -2.3)	0.7	0.2	-0.5 (-1.9, 0.9)	0.7	0.0	-0.7 (-1.6, 0.2)
Staff Management of PA												
Frontline staff giving instructions	6.7	2.1	-4.6 (-9.2, 0.0)	18.6	16.8	-1.8 (-8.5 4.9)	8.8	5.7	-3.1 (-8.4, 2.1)	3.1	3.5	0.4 (-3.1, 3.9)
Frontline staff disciplining children	3.0	3.7	0.7 (-3.6, 5.1)	4.9	3.7	-1.2 (-5.6 3.2)	1.5	1.6	0.0 (-2.7, 2.7)	0.7	0.5	-0.2 (-1.4, 0.9)
Idle-time (i.e. children waiting for direction from staff with no specific task)	46.5	22.3	-24.3 (-39.0, -9.5)	38.9	11.8	-27.1 (-35.9 -18.3)	39.0	11.6	-27.3 (-40.5, -14.2)	27.4	19.7	-7.7 (-19.7, 4.4)
Children standing in line and waiting for turn	9.2	7.3	-1.9 (-9.9, 6.1)	26.4	6.8	-19.6 (-29.4 -9.8)	0.1	1.2	1.1 (-1.2, 3.4)	-	-	-
Playing elimination game (i.e. children eliminated from PA opportunities)	0.3	4.1	3.9 (-2.6, 10.3)	21.9	7.0	-14.9 (-25.3 -4.5)	0.1	1.5	1.4 (-0.9, 3.7)	-	-	-
Small game (i.e. games with less than 10 children participating)	1.8	9.6	7.8 (0.7, 14.9)	10.1	15.6	5.5 (-4.1 15.0)	-	-	-	-	-	-
Choice provided (i.e. more than one activity opportunity provided)	9.9	35.5	25.6 (12.4, 38.9)	5.9	26.5	20.6 (10.0 31.3)	0.0	5.2	5.2 (-1.2, 11.6)	0.9	0.0	-0.9 (-2.5, 0.8)
Staff leading energizer (i.e. active game to interrupt long sedentary	-	-	-	-	-	-	0.2	11.5	11.3 (6.0, 16.4)	0.0	5.8	5.8 (3.0, 8.6)
Active Equipment Available	54.5	57.5	3.0 (-14.3, 20.4)	47.0	58.8	11.8 (0.5 23.2)	0.4	5.8	5.4 (-0.9, 11.7)	2.3	0.2	-2.1 (-4.5, 0.4)
Sedentary equipment available (board games, books, legos, etc.)	28.4	7.2	-21.1 (-36.7, -5.5)	6.2	2.4	-3.8 (-10.2, 2.6)	85.0	67.1	-17.9 (-30.0, -5.8)	74.3	73.9	-0.4 (-17.1, 16.3)
Indoor Activities	48.5	36.1	-12.3 (-34.4, 9.8)	42.0	35.6	-6.4 (-19.9 7.2)	94.9	95.8	0.9 (-10.2, 11.9)	73.7	67.9	-5.8% (-15.4, 3.8)

Data presented represents model adjusted means

Statistically significant changes at are bolded

“-” Indicates behavior not observed during ASP context

Table 2
Changes in proportion of scans spent in SOPLAY activity levels from baseline to post-assessment

<i>Percent of Scans Children were engaged in sedentary and MVPA throughout the ASP (3-6PM)^a</i>					
	Fall 2011	Spring 2012	Percent Change	Confidence Interval	
Boys					
Sedentary	73.6	62.2	-11.4	(-15.3, -7.44)	
MVPA	8.2	13.1	4.9	(2.8, 7.0)	
Girls					
Sedentary	78.3	68.6	-9.7	(-13.1, -6.4)	
MVPA	5.6	10.7	5.1	(3.1, 7.1)	
<i>Percent of Scans Children were engaged in sedentary and MVPA during scheduled physical activity^b</i>					
	Fall 2011	Spring 2012	Percent Change	Confidence Interval	
Boys					
Sedentary	54.8	45.4	-9.4	(-13.8, -4.9)	
MVPA	16.6	20.0	3.4	(0.3, 6.4)	
Girls					
Sedentary	62.6	53.6	-9.0	(-13.8, -4.3)	
MVPA	11.7	17.3	5.6	(2.0, 9.2)	

^aBased on 4,648 scans over 44 days
^bBased on 2,211 scans over 44 days

Table 3
Percent of Boys and Girls observed Sedentary and in Moderate to Vigorous Physical Activity by Afterschool Program Context

	Girls						Boys								
	Percent of Total Scans ^a			Percent Sedentary			Percent MVPA			Percent Sedentary			Percent MVPA		
	Fall	Spring		Fall	Spring	95% CI	Fall	Spring	95% CI	Fall	Spring	95% CI	Fall	Spring	95% CI
After-school Program Context															
Enrichment	23.8	16.3	-7.5	89.6	83.2	-6.4 (-10.9, -1.8)	1.9	5.0	3.1 (0.7, 5.5)	86.8	79.8	-7.0 (-12.0, -2.0)	2.1	6.1	4.0 (1.6, 6.4)
Physical Activity															
Free play	43.6	21.9	-21.7	57.0	48.2	-8.8 (-15.0, -2.6)	12.4	18.4	6.0 (2.8, 9.3)	52.8	43.5	-9.3 (-16.9, -1.7)	16.2	24.6	8.4 (3.8, 12.9)
Organized	56.9	78.9	22.0	67.6	54.6	-13.0 (-18.4, -7.5)	10.9	16.3	5.4 (1.0, 9.9)	56.6	45.4	-11.2 (-16.6, -5.9)	17.4	18.9	1.6 (-2.9, 6.0)
Snack	6.1	7.8	1.7	81.5	85.8	4.3 (-1.6, 10.2)	3.1	3.4	0.3 (-3.2, 3.8)	77.5	84.8	7.3 (0.4, 14.2)	3.9	4.5	0.6 (-2.7, 4.0)
Bathroom/Changing	4.0	4.8	0.9	84.1	83.7	-0.4 (-9.1, 8.3)	0.5	1.1	0.6 (-0.5, 1.6)	83.6	78.9	-4.7 (-14.2, 4.8)	3.3	2.8	-0.5 (-3.0, 1.9)
Academics	19.8	15.5	-4.3	92.8	90.6	-2.2 (-5.7, 1.3)	0.7	2.8	2.1 (0.2, 3.9)	91.9	88.8	-3.0 (-6.4, 0.3)	1.3	4.3	3.0 (1.0, 5.1)
Track Change	3.3	2.3	-1.0	83.4	74.5	-8.9 (-22.3, 4.5)	6.4	5.1	-1.3 (-11.8, 9.3)	83.3	72.8	-10.5 (-18.9, -2.1)	3.5	6.0	2.5 (-2.6, 7.5)
Other	4.0	4.0	0.1	74.8	71.1	-3.7 (-17.2, 9.9)	1.6	10.6	9.1 (2.1, 16.0)	78.5	69.5	-9.1 (-22.8, 4.6)	1.7	8.9	7.1 (1.7, 12.6)

^aDo not sum to 100% because some activities can be occurring simultaneously (e.g. snack and academics)

Statistically significant changes are bolded

Data presented represents model adjusted means