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### One, Two, Three Strikes and You're Out? Examining Youth Physical Activity in the Context of the Health Promoting Secondary Schools Model and Teacher Job Action

Concern about the health of Canadian adolescents has greatly increased over the past decade particularly related to physical inactivity where a majority of children are not active enough to reap health benefits (Colley et al., 2011). Because physical activity (PA) is established during the formative years, the consequences of this inactivity can have long term health impacts in terms of chronic diseases (Lee et al., 2012). School-based programmes have the potential to reach the greatest number and most diverse population of children (Kriemler et al., 2011). In particular, comprehensive school health (CSH) programmes are considered one of the best investments for improving PA levels as they address learning, policy and supports across the school setting, and require involvement from the students, teachers, administrators and community. Further, we know that the school context is fundamental to promoting PA via physical education (PE) classes, organized sport, and casual activities outside of class time (Storey et al., 2011). Clearly, schools have an important role in promoting PA.

CSH models, though effective at improving PA, have largely been conducted within elementary and middle schools in Canada (Storey et al., 2011). Also rare in the literature are accounts of how teacher job action influences the implementation of in-school PA. We identified two studies only describing how job action restrained students' PA engagement

in Brazil (de Barros et al., 2009), and Montreal (Pabayo et al., 2006).

In British Columbia, a CSH intervention to increase physical activity and healthy eating by secondary school students was implemented during 2011-2012 entitled Health Promoting Secondary Schools (HPSS), and it represented a 'for youth with youth' approach that relied on teacher facilitation for curricular and extra-curricular activities. During the implementation phase, the teachers' union was involved in contract negotiations with the provincial government that resulted in the withdrawal of voluntary and administrative services providing us with the opportunity to assess the impact of job action on students' physical activity.

Drawing on data from our mixed-methods study (Wharf Higgins et al., 2013), in this paper we examine the Moderate to Vigorous Physical Activity (MVPA) levels and extracurricular involvement of students who participated in HPSS, and explore the impact of a naturally occurring event (teacher job action) on student PA. We anticipated a decline in PA variables across the study timeframe, and hypothesized that PA levels would increase following the resolution of the teacher job action, particularly for weekday PA and extracurricular activities that relied on teaching staff.

#### Methods

We describe our study as a Real Community Trial (Wharf Higgins et al., 2013) blending

quasi-experimental and community-based research strategies. This trial combined quantitative techniques to measure student level PA outcomes, with student and staff focus groups and implementation data to capture perspectives on programme use and development. HPSS was inspired by the successful elementary CSH model of Action Schools! BC (Naylor et al., 2006), and developed based on extensive consultation with secondary school stakeholders in BC and the literature. Briefly, the HPSS intervention consisted of providing teachers with choice-based PE 10 and Health 10 curricula and teaching resources. Schools were also provided with \$4,100 (CAD) to purchase equipment or services supporting school-wide policies/activities, and a school liaison to facilitate the planning and implementation of the HPSS model with each school's 'action team' committee. The HPSS school action team included staff and students who organized events, activities, and policy changes related to PA and healthy eating at their school. Increasing MVPA was a central goal of the HPSS initiative.

Ethics approval was secured through the Universities of Victoria and British Columbia Human Research Ethics Boards. Eligible schools (N = 10) were matched for demographics and geography and randomly assigned to either a wait-listed control or intervention condition. Baseline measurements were taken and the intervention initiated in late September 2011 (T1). In May and June of 2012, we gathered post-intervention measurements (T2). The following academic year (beginning September 2012) three of the waitlisted control schools opted to receive the intervention materials, support, and grants, and participate in a final set of measurements (June 2013, T3). Also, two of the original intervention schools volunteered to complete additional follow up measures to capture longer-term trends at T3. We conducted focus groups at T2 and T3, and gathered implementation data throughout the project. In this paper, we focus on methods pertaining to PA.

#### **Grade 10 students**

Grade 10 students (N = 441) were invited to complete the survey measures via PE and health classes. Grade 10 students were 15.3 years old

(median) at baseline. Median Body Mass Index was 21.9. Participants, (49.7% female, 67% identified as Caucasian), reported an average house hold income of \$80,097 (Wharf Higgins et al., 2013). We assessed PA using the Canadian SHAPES questionnaire, a valid and reliable PA measure (Biddle et al., 2011), that uses a seven-day-recall format. MVPA was assessed as the sum of total minutes: over seven days (Weekly); Monday to Friday (Weekday); Saturday to Sunday (Weekend); and, extracurricular PA as a sum of the total affirmative responses to questions about involvement in sport or other activities outside of formal class time (e.g., teams, clubs etc.). We used baseline measurements to classify students for analyses as either meeting or not meeting Canada's PA guideline of 60 minutes per day.

#### **Focus groups**

Focus groups captured PE 10 and Health 10 teacher (N = 25), student (N = 63), and action team members' (N = 34) experiences with HPSS at T2. We present data pertinent to the teacher strike in order to contextualize and explicate the quantitative findings. We posed no specific question regarding job action. However, we asked about participants' experiences with HPSS, including challenges to implementation, and this spawned responses related to the teacher strike. A trained research assistant conducted and audio recorded focus groups. We obtained implementation information from the intervention schools including: Action Team meeting minutes; expense reports of grant monies; and teacher checklists to report how HPSS materials were utilized in class.

#### **Data Analyses**

Survey data were analyzed in SPSS 22.0. Those with missing data for a given outcome variable were not included in the related analysis. A series of Repeated Measures ANOVAs were conducted to determine if there were significant effects over time and if these effects differed by treatment group or school from T1 to T2. Effect size (d) was calculated to provide additional meaning regarding the magnitude of the effect (Cohen, 1992). Focus group data were transcribed verbatim and imported and analysed in NVivo 10.0. Open coding was followed by grounded theory

strategies to identify central themes (Patton, 2002). Implementation data sources were transcribed, organized by school, and imported into NVivo 10. A summary of events, activities, policies, and HPSS material use were tabulated to gauge each school's involvement.

## Results

Participant numbers varied across T1 (N = 441), T2 (N = 387), and T3 (N = 75). At baseline, students attending intervention schools had lower MVPA than those attending control schools. We provide our T1 and T2 outcomes in Table 1 (page 115). Weekday PA declined significantly ( $F = 128.2$ ,  $p < 0.00$ ,  $d = 1.1$ ) while Weekend PA did not ( $F = 2.34$ ,  $p = 0.13$ ,  $d = 0.17$ ). A graphical representation of these data visually depicts an interaction for weekly and weekday MVPA by time (Figures 1 and 2, page 117), indicating a trend whereby the intervention group fared better.

These results may be better understood within the context of that academic year, during which the aforementioned teacher strike occurred. Figures 1 and 2 (page 117), which included trend data from T3 follow up surveys, clearly showed the rise in MVPA for the intervention group coinciding with the resolution of the teacher strike. Exploring differences in activity across time by school (rather than treatment group) shed light on this decline from T1 to T2. For example, extracurricular PA involvement over time appeared to interact with the variable 'school attended'; although this only approached significance with a small to medium effect size (Table 2, page 115). Similarly, we noted trends (non-significant) from T1 to T2 for an interaction between school and Weekly MVPA ( $F = 1.28$ ,  $p = 0.25$ ,  $d = 0.43$ ) and Weekday MVPA ( $F = 1.14$ ,  $p = 0.33$ ,  $d = 0.35$ ) that had notable effect sizes over the strike year.

### Focus group data

Focus group data revealed a primary theme we referred to as *Striking Out* with three categories: *Strike One: Students Feel Off Base*; *Strike Two: A Swing and a Miss for HPSS Implementation*; and *Strike Three: Constraints Bench Teachers* (Table 3, page 116). Teachers were concerned about the impact that the aspects of their job action (e.g., withdrawal of voluntary services) was having on their ability

to implement activities, creating decreased accessibility to and extracurricular time for students. For example, one teacher summarized the core issue of implementing and sustaining HPSS, "*our union has passed a motion that we are not to be taking on any extracurricular activities so we may be not taking on extracurricular activities for quite some time.*"

Similarly, students agreed that the teachers' withdrawal of voluntary services associated with their job action imposed difficulties in relation to sports and health education in particular, as well as for HPSS use, as indicated by one student on an action team: "*they figured that we just understood that they wouldn't be able to do anything with us anymore so there was no, like, talking between them and us, it just stopped being organized. And they couldn't do anything about it because their hands were tied.*" Sporting events, extracurricular activities, and event planning were among the items put on the "back burner" during the strike.

Based on our survey and focus group data, we believe students were negatively affected during teacher job action. Implementation data reveal how schools navigated through the year of job action using HPSS materials. Specifically, schools 2 and 4 delivered the fewest health education actions and lessons, were the least involved with HPSS, and experienced the largest decline in MVPA and extracurricular activity (Table 4, page 117). Further, teachers from school 2 did not participate in action team meetings due to the job action:

*Teachers have been instructed to withdraw from all committees and volunteer groups in our district as part of job action, so there likely won't be any teachers in attendance on the Action Team. This has made the HPSS project quite difficult...at [our school] [correspondence from teacher at school 2].*

As a result, the Action Team at this school folded midway through the year, and policies and events were not carried out. These data support the notion that schools fared differently over the job action year (and in terms of the intervention) despite being in the same treatment group.

## Discussion

Students' overall MVPA and the proportion of those meeting PA guidelines declined over the school year in all schools regardless of group

assignment. It is possible that the intervention was flawed, or the decline was a product of other factors (Bruner et al., 2009). However, given that the decline in MVPA was largely accounted for by Weekday PA, a slow recovery was observed in MVPA among the intervention group members, and there were candid expressions of focus group members and implementation data, we argue that job action was a contributing culprit in the falling PA rates, as well as poor uptake and impact of the HPSS model. Others have found that school readiness and initial capacity contributes to the success of school based health programmes (Flaspohler et al., 2012). We suspect these were at play in HPSS in terms of a school's ability to navigate a new programme during a school year affected by teacher job action.

We found little in the scholarly literature related to the influence of job action on teachers' ability to implement a CSH model for high school students with the exception of de Barros and colleagues (2009) where their treatment groups declined in overall PA over the academic year, although *"the intervention was effective at minimizing this reduction in the intervention group"* (de Barros et al., 2009:165). The argument that a teachers' strike would impact implementation has face validity. Specifically, the HPSS model was designed for and depended upon teachers and students working together in classroom settings and during extracurricular times. By limiting teachers' involvement in extracurricular activities including facilitating meetings, sports, intramurals, clubs, teams, and school wide events, job action stifled many of the HPSS action plans, thereby restricting opportunities for school related PA. Student motivation to engage in sport activity can depend on teacher motivation both in and out of the PE classroom (Radel et al., 2010). In our case, with teachers no longer adopting PA-supportive roles during the strike, students' engagement decreased in overall PA and extracurricular activity involvement.

We acknowledge the difficulty associated with schools' abilities to mitigate the effect of job action on their students. It could be argued, however, that PA, given its known benefits to student health (Tremblay et al., 2010) and enhanced cognition (Rasmussen and Laumann,

2013), could be considered an essential service during political labour disputes. Thus, in future instances of job action at schools, having peer-facilitated extracurricular options as a permanent component of a school's PA programme may be particularly important for older students who are more influenced by friends than family (Edwardson et al., 2013). This would also support teachers if they were unable to engage in extracurricular activities for a variety of reasons (including time, competing demands and job action, to name a few) and also promote student leadership, choice and capacity building—central tenets of the HPSS model. In fact, Pabayo et al. (2006) found schools that maintained a high number of extracurricular PA options during labour action had significantly more active students after a strike than schools that banned such extramural PA.

Our findings highlight the essential role that teachers play in the success of any school-based PA model, programme and activity. We encourage the school community to consider other models of support for students that do not rely exclusively upon volunteer time and the good will of teachers to provide PA for our youth. Further embracing and entrenching CSH models can create opportunities for extracurricular PA and adult mentorship via recreation centres, community teams etc., so as not to place the entire burden on teachers.

### Limitations

We relied on self-reported PA data which has known limitations. Within the survey, the extracurricular activity question was limited to five yes-no questions about general involvement in physical activity outside of class; our non-significant results may have been artefacts of the questions posed. Beyond instrumentation, it is also important that this was a naturally occurring experiment, in terms of the strike, thus research questions were retrospective in nature. The sample was also very physically active at baseline indicating a potential recruitment bias. Further, T3 must be interpreted as trend data only given the high attrition rate and the fact that waitlisted control schools were provided access to HPSS materials at this time.

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Table 1. Physical Activity Pre to Post test (T1-T2) by Treatment Group

Variable	N	F	p	$\eta^2$	Observed Power
Weekly MVPA (minutes/week)	263	50.9	0.00	0.16	1.0
Weekly MVPA X Group		0.04	0.85	0.00	0.05
Weekday MVPA (minutes/day)	347	128.21	0.00	0.27	1.0
Weekday MVPA X Group		0.34	0.56	0.00	0.09
Weekend MVPA (minutes/day)	333	2.34	0.13	0.01	0.33
Weekend MVPA X Group		0.37	0.54	0.00	0.09
Extracurricular PA Involvement	375	0.01	0.93	0.00	0.05
Extracurricular PA X Group		0.01	0.93	0.00	0.05
Met PA Guideline (60minutes per day)	286	2.89	0.09	0.01	0.40
Met PA Guideline X Group		0.51	0.47	0.00	0.11

Calculated using a Repeated Measures ANOVA

MVPA based on SHAPES questionnaire, minutes of moderate and vigorous activity, Q4-Q5

Treatment CONTROL or INTERVENTION

Table 2. Outcome Variables By School Rather Than Treatment Group (T1-T2)

Variable	N	F	p	$\eta^2$	Observed Power
Weekly MVPA (minutes/week)	263	28.67	0.00	.10	1.0
Weekly MVPA X School		1.28	0.25	0.04	0.62
Weekday MVPA (minutes/day)	347	82.2	0.00	0.20	1.0
Weekday MVPA X School		1.14	0.33	0.03	0.57
Weekend MVPA (minutes/day)	333	0.71	0.40	0.00	0.13
Weekend MVPA X School		1.41	0.18	0.04	0.68
Extracurricular PA Involvement	375	0.05	0.82	0.00	0.06
Extracurricular PA X School		1.85	0.06	0.04	0.82
Met PA Guideline (60 minutes per day)	286	2.04	0.15	0.00	0.30
Met PA Guideline X School		1.62	0.11	0.05	0.75

Calculated using a Repeated Measures ANOVA

MVPA based on SHAPES questionnaire, minutes of moderate and vigorous activity, Q4-Q5

Table 3. Summary of Focus Group Theme – ‘Striking Out’

Theme	Description	Example Quotes
Strike One: Students feel off-base	Outcomes of the strike on students' PA and learning activities (what students actually DID e.g. lessons).	Student: "Like when you're a smart kid it's OK but when you're a kid that struggles and needs help at lunch you're gonna like they're basically setting us up to fail almost..."
Strike Two: A swing and a miss for HPSS Implementation	The ability of students and staff to gather together, plan, engage in, organize and implement HPSS and related activities.	Teacher: "I felt sorry for the girls actually because of job action it was harder to ask teachers to do stuff... Harder to ask for help. With job action this year was very difficult. We have a very 'gung ho' school and it was just a very weird year here."  Action team: "Maybe it would have been...had this been in a different year maybe the staff would have been into all the extras we were doing like the runs."
Strike Three: Constraints bench teachers	Teachers' experiences about their inability to commit to HPSS because of labour action regulations	Teacher: "The nature of the year in terms of having job action and it being...I mean teachers feel inundated anyways with our normal tasks that we have to do each day. Right now we are all feeling a little overworked so adding more to it was difficult ... we had to let go of a lot."

Table 4. Implementation Data

School	Implementation Data Components Completed	No. of HPSS Actions	Average Health Actions/Teacher	Change MVPA Minutes/Week	Average Extracurricular Involvement Over the Year
1	5	11	28	-23.0	+0.55
2	2	5	20	-334.0	-0.76
3	5	9	30	-146.0	-0.55
4	3	6	21	-287.0	-0.46
5	5	11	32	-200.0	+0.04

Figure 1. Weekly MVPA Trends T1-T3

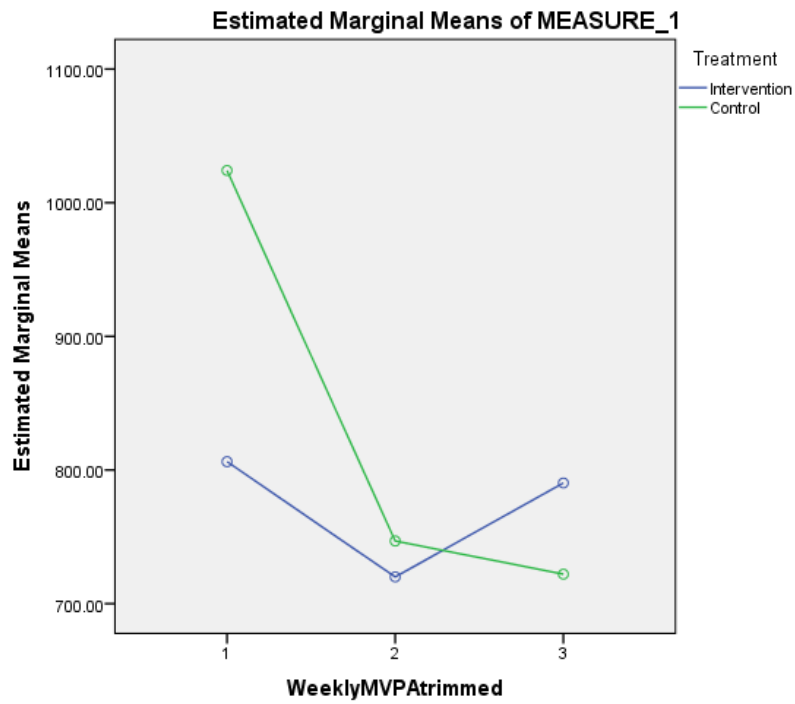


Figure 2. Weekday MVPA Trends T1-T3

