Australian Journal of Teacher Education

Volume 40 | Issue 6 Article 4

2015

Should Educators be 'Wrapping School Playgrounds in Cotton Wool' to Encourage Physical Activity? Exploring Primary and Secondary Students' Voices from the School Playground

Brendon P. Hyndman
International Graduate Centre of Education, School of Education, Charles Darwin University, brendon.hyndman@cdu.edu.au

Amanda Telford
Discipline of Exercise Sciences, School of Medical Sciences, RMIT University, amanda.telford@rmit.edu.au

Should Educators be 'Wrapping School Playgrounds in Cotton Wool' to Encourage Physical Activity? Exploring Primary and Secondary Students' Voices from the School Playground

Brendon Hyndman
Charles Darwin University
Amanda Telford
RMIT University

Abstract: Physical activity in school playgrounds has changed considerably over recent decades to reflect a climate of 'surplus safety'. A growing culture of surplus safety can be attributed to a desire of parents and teachers responsible for children to protect school students from danger. The aim of this research was to examine students' perceptions of playground safety influences on physical activity during school breaks from the perspectives of the 'users' of school playgrounds. Data collection consisted of seven focus groups (4 primary school & 3 secondary school) conducted across four schools (2 primary & 2 secondary). During this study, the focus group discussions consisted of 54 children (32 primary & 22 secondary; 50% females; 50% males). Social-Ecological Model levels of school playground safety influence identified by both primary and secondary school students included intrapersonal safety influences (risk taking, preventing boredom, misbehaviour); interpersonal safety influences (teacher responsibilities, teacher support, peer support, teacher intimidation and bullying/territorial issues); physical environment safety influences (surfacing, protection from the weather, safe structures, protective equipment, playground space, hydration, school security and passive smoking protection) and policy/organisational safety influences (designated play areas, playground rules, further supervision, maintenance). This research addresses an important gap in the literature by providing useful information for teacher educators of the multiple safety influences on students' participation in playground physical activity.

Background

The promotion of an active lifestyle for students is important to lay the foundation for a physically active lifestyle (Dobbins, De Corby, Robeson, Husson, & Tirilis, 2009). In some instances early lifestyle and activity habits have been reported to track into adulthood and can help reduce the risk of chronic diseases (Telama, 2009). Schools are often targeted as the key setting to develop students' physical activity standards (Eisenmann, 2006). Physical activity is defined as any bodily movement produced by skeletal muscles that expends energy (Caspersen, Powell & Christenson, 1985). Many physical activity opportunities exist in schools including physical and sport education programs, after school activities and play during school breaks (Olds et al., 2009). There is a developing trend of schools looking to facilitate students' physical activity via non-curricular playground strategies during school breaks (Hyndman, Telford, Finch, & Benson, 2012). Growing evidence suggests schools can enhance play opportunities during school breaks, which can contribute up to 50% of students'

recommended daily physical activity of one hour of moderate to vigorous physical activity (MVPA) each day (e.g. jogging-type intensity physical activity; Tudor-Locke, Lee, Morgan, Beighle, & Pangrazi, 2006). Students in some schools have up to 600 school breaks per year (including 3 times per day, 5 days per week, 39 weeks per year; Stratton, 2000) offering significant time for students to be physically active via active play. With students estimated to be spending 30 hours per week attending school and accumulating up to 35% of school breaks engaged in moderate to vigorous physical activity (MVPA; Nettlefold et al., 2010), it is important for teacher education programs to develop pre-service teachers' knowledge and awareness of the influences on students' play during school breaks.

In addition to being a major source of students' daily physical activity, play during school breaks has been acknowledged as an effective developmental and learning tool to complement or supplement the curriculum (Hyndman, Benson, & Telford, 2014). Active play has been associated with improvements in students' physical, cognitive and social development (Hyndman, Benson, & Telford, 2014). Such potential for student learning and development has resulted in international governments (UK, Canada, USA, Sweden) developing a host of policies to enhance school play areas and the quality of students' play (Tranter & Malone, 2004).

As educators (e.g. schools, principals, teachers, teacher educators/academics, pre-service teachers) are often key stakeholders in the development of playground policies, planning and implementation in schools (Hyndman et al., 2012), teacher education programs can train pre-service teachers to play a key role in developing a safe, inclusive playground physical activity environments (Wyver et al., 2010). A playground is defined as (i) an outdoor area provided for children to play in, especially at a school or public park; (ii) a place where a particular group of people choose to enjoy themselves (Oxford Dictionaries, 2015). It has been reported that Victorian primary school students' enjoyment of playground activities can vary significantly from day to day (Hyndman, Telford, Finch, Ullah & Benson, 2014) and is significantly highest earlier within a school year (Hyndman, Chancellor & Lester, 2015). In Australia, there is an absence of safety regulations governing school playgrounds beyond the national standards for manufacturing playground equipment (Australian Playground Safety Standards, 2004) and the majority primary school facilities within the state of Victoria are often over 50 years old (Chancellor, 2013). The most common school playground features reported across Victoria have included sporting areas such as basketball courts, netball courts, sandpits, grassed play areas and football ovals (Chancellor, 2013). Educators plan, manage and monitor school playgrounds as they see fit (Chancellor, 2013). Within Victorian schools, it has been revealed that all educators are allocated to undertake playground supervision during school breaks and the impact of such supervision on students' play opportunities is little understood (Chancellor, 2013). It has been reported in Victoria that educators frequently report playground supervision (e.g. 'yard duty) as something they wish to forego (Chancellor, 2009). During stressful days of classroom teaching, daily playground supervision is often seen as burdensome to already busy educators (Chancellor, 2009). With educators across the teaching profession allocated playground supervision duties on a daily basis and safe play activities part of the national curriculum, it is important to provide insight into what students perceive are important safety influences within school playgrounds.

Research is beginning to recognise that school playground safety can influence students' physical activity (Willenberg et al., 2009). Physical activity in Australian school grounds has changed considerably over recent decades to reflect a climate of 'surplus safety' (Wyver et al., 2010). The playgrounds and policies of many Australian schools have reduced students' opportunities for active, creative, and diverse play (Chancellor, 2013). Significant school playground changes in Victorian primary schools have included: the reduction of school break time (i.e. lunch & other recess periods); removal of playground equipment, the

merging of school facilities which can result crowded play spaces; and restrictive rules relating to students' use of school grounds that can lead to teachers undertaking playground policing-type roles (Chancellor, 2013). The reduction in students' active play opportunities within Australian schools could be attributed to a growing culture of 'risk anxiety' (Scott, Jackson, & Backett-Milburn, 1998). There is a growing societal trend in Australia of adults perceiving students as vulnerable and wanting to protect the younger generation from a suite of modern dangers, a 'cotton wool' generation of students (Tranter & Sharpe, 2007). Playground activities have become more organised, supervised and directed by adults (Wyver et al., 2010) and parents are suggested to be more likely to want to accompany children during their play activities (Fyhri & Hjorthol, 2009).

A growing culture of 'surplus safety' reflects the desire of parents and teachers responsible for children to protect Australian school students from danger (Wyver et al., 2010). However, many adults are primarily focused on the risk of 'physical' injury dangers (Bundy et al., 2009). A study across Sydney primary schools identified that parents can often become unaware of other levels of danger within school playgrounds that can result from restricting active play on cognitive (e.g. reduced mental health) and social (e.g. bullying; Bundy et al., 2009). Moreover, students can lose confidence to be physically active via an adult culture of over-protection (Wyver et al., 2010). Adult concerns of danger from school playgrounds could stem from playground equipment being the leading cause of all child fall-related hospitalisation in Australia (Berry, Jamieson, & Harrison, 2010). Although a number of Victorian and NSW studies have described the detrimental effects of a culture of 'surplus safety' (Bundy et al., 2009; Malone, 2007; Wyver et al., 2010) and there is a high national hospitalisation rate from playground injury (Berry et al., 2010), there is a gap in the literature examining students' perceptions of playground safety to participate in physical activity. It is important to gain insight into students' perceptions of playground safety influences, as students are the primary users of school playgrounds for physical activity (Hyndman, Telford, Ullah, Finch & Benson, 2013; Hyndman, 2015). Providing insight for the teacher education community (schools, principals, teachers, teacher/educators/academics, pre-service teachers) of the playgrounds safety influences that can affect students' physical activity can inform safer school playground policies and supervision.

The Social-Ecological Model was applied as the theoretical foundation of the study. The model emphasises a 'person-environment' fit, implying that there is an association between the intra-personal (individual) level, inter-personal (social) environment level, physical environment level and policy levels of influence within an environment (Salmon & King, 2010). The Social-Ecological Model framework can provide a comprehensive insight for teachers of the influences on students' physical activity (Salmon & King, 2010; Wattchow, Jeanes, Alfrey, Brown, Cutter-Mackenzie & O'Connor, 2013). By applying a Social Ecological Model framework in this study, it can also guide the development of future school playground interventions (Hyndman, Benson, & Telford, 2014). Despite the importance of applying a Social-Ecological Model framework to evaluate the levels of school playground safety influence on students' physical activity, there is a paucity of literature applying the framework to examine students' perceptions (Moore et al., 2010), especially within a school context. No study we are aware of has provided an insight for the teacher education community (schools, principals, teachers, teacher educators/academics, pre-service teachers) of the Social-Ecological Model levels of school playground safety influences on students' physical activity during school breaks. The aim of this study was to explore primary and secondary school students' perceptions of the playground safety influences on physical activity participation during school breaks.

Practical Implications for Teacher Education

Findings from this study could be used to improve pre-service and in-service teachers' understanding of the school playground safety influences on students' physical activity participation. It is important to improve teachers' understanding of the safety influences within school playgrounds as teachers are the 'gate-keepers' to school playground planning and policies. The present study is linked to the Australian Institute for Teaching and School Leadership (AITSL) standards that outline:

- 'Teachers should know students and how they learn' (e.g. teachers can understand how students develop & learn physical skills in the school playground; Professional Knowledge, Standard 1; AITSL, 2011);
- 'Create and maintain supportive and safe learning environments' (e.g. teachers can gain insight into considerations for providing a safe & supportive playground learning environment; Professional Practice, Standard 4; AITSL, 2011);
- 'Plan for and implement effective teaching and learning' (e.g. teachers can plan and implement playground strategies to ensure students have the opportunity to develop physical skills; Professional Practice, Standard 5; AITSL, 2011);
- 'Engage professionally with colleagues, parents/carers and the community' (e.g. teachers can work together with staff, parents and the community to provide a safe & supportive playground learning environment for students; Professional Engagement, Standard 7; AITSL, 2011).

With 'active play' and safe playground participation within the focus areas of the foundation to year six Australian Health and Physical Education (HPE) curriculum (ACARA, 2014), the importance of teachers recognising the safety influences on students' physical activity participation within playgrounds is underlined. There are a range of curricular points related to students' engagement in playground physical activities within the 'contributing to healthy and active communities' and 'moving our body' sub-strands within the Australian HPE F-6 curriculum (ACARA, 2014). A snapshot of such HPE curricular points are outlined below:

- Participate in play that promotes engagement with outdoor settings and the natural environment, including a range of ways to play and understanding how to be safe in the outdoors through play (ACPPS007; ACARA, 2014);
- Follow rules when participating in physical activities (ACPMP014; ACARA, 2014), including instructions for personal safety and fair play, identifying boundaries such as personal space and playing area and demonstrating appropriate use of equipment;
- Identify and practise strategies to promote health, safety and wellbeing (ACPPS036; ACARA, 2014), including practicing ways of behaving in the playground that ensure the safety of themselves and others;
- Describe strategies to make the classroom and playground healthy, safe and active spaces (ACPPS040), including accessing opportunities to be active whilst at school;
- Adopt inclusive practices when participating in physical activities (ACPMP048; ACARA, 2014).

The school playground is a transferable setting for students to demonstrate, practice and trial the physical skills being developed and taught by educators from HPE classes. The multiple levels of school playground safety influence on students' participation in physical activity requires further exploration and replication within the educational context. The

present study provides impetus for teacher training programs to provide units of study to develop pre-service teachers' awareness of the influences on safe physical activity participation within school playgrounds and re-think the notion of 'surplus safety' within school playground planning, organisation and implementation. Although teachers often identify play as teacher driven and miss potential scaffolding opportunities (Pui-Wah & Stimpson, 2004), the present study demonstrates the potential opportunity for teachers to develop safe physical activity behaviours within school playgrounds without increasing the demands on already burdened teaching staff.

Method

Participants

A qualitative focus group discussion methodology was utilised within the study, underpinned by a Social Ecological Model framework (Salmon & King, 2010). In order for participants to be recruited for the focus group discussions, the principals of four government schools (two primary & two secondary) in the western region of Victoria were randomly selected and approached by researchers during Winter, Term 2 of 2009 (Winter). All schools from the western region were consecutively numbered, and a random number generator was used to select the four schools. Three schools approved the invitation and participated in the study (two secondary & one primary). Due to the difficulty of obtaining one more primary school in the western region, a government primary school in regional outer Eastern Melbourne with a low Socio Economic Index for Areas (SEIFA) was approached and recruited. This ensured two schools from low SES (lower tertile areas) and two schools from mid SES (middle tertile) with a primary and secondary for each SES category were included in the study.

Initially, primary school students (all Year 5 & 6 students) and secondary school students (all Year 7 & 8 students) aged 9-13-years-old were invited to participate via a letter and consent form distributed in June and July of 2009. Year five and six primary school students were targeted as students over 10 years are more capable of accurately and reliably self-reporting their own health behaviour (Riley, 2004). In order to gain insight of the school playground safety influences on physical activity for teachers of both primary and secondary school students, year seven secondary school students were recruited.

All students interested in participating were instructed to obtain parental consent and return their consent forms to the general office of their school and attend the scheduled focus group and/or map drawing session. During this study, 54 students from all four schools aged 10 to 13 years (50% females; 50% males) returned their consent forms by the due date and all students who volunteered participated in the study. The focus group discussions consisted of 54 students (32 primary & 22 secondary). With extremely low proportion of language backgrounds other than English (LOTE) and/or indigenous students within the four schools (ACARA, 2010), cultural/ethnic differences were not explored.

Ethical approval for the study was obtained from the University of Ballarat Human Research Ethics Committee, the Department of Education and Early Childhood Development (DEECD) and permission was gained from the school principals.

Primary and Secondary School Playground Settings

Playground features within the first primary school included a large grass sporting oval, hard-surfaced outdoor basketball court, hard-surfaced outdoor netball court, a central courtyard with hopscotch markings, an enclosed vegetable garden and a large grass area with many trees and large rocks at the front of the school. There were also three sets of fixed school playgrounds assigned for primary, middle primary and later primary school students. There were a total of 187 students (1% indigenous, 6% LOTE, 91% attendance rate) and 15 teaching staff at primary school one (ACARA, 2014). Within the second primary school there was a large outdoor basketball court area, miniature outdoor basketball court area, four sets of fixed playground equipment, a large shaded sandpit and an extensive assortment of playground surface markings (e.g. hopscotch, number/letter shapes, animal shapes, checkered shapes etc). There were a total of 498 students (2% indigenous, 8% LOTE, 94% attendance rate) and 28 teaching staff at primary school two (ACARA, 2014).

Within the first secondary school, playground features included a set of fixed playground equipment, large canteen area with dozens of picnic tables, an archery wall, soccer oval, cricket oval and large grass area with many trees and picnic tables/benches at the front of the school. There were a total of 1092 students (2% indigenous, 2% LOTE, attendance rate was not available for this school) and 91 teaching staff at secondary school one (ACARA, 2014). The second secondary school's playground features included a large grass cricket oval, a bike shed, large student lounge, outdoor basketball court, outdoor synthetic surfaced soccer court (fenced), outdoor natural area with a number of trees and sitting benches, two courtyard areas with picnic tables/benches, a small concrete court without lines and a large empty spaced area (e.g. no fixed facilities or grass). There were a total of 1100 students (1% indigenous, 5% LOTE, 91% attendance rate) and 87 teaching staff at secondary school two (ACARA, 2014). Further contextual insight of the primary and secondary school playgrounds can be viewed within the results section (see Figures 1-9).

Focus Group Discussions

For the present study, seven focus groups (4 primary school & 3 secondary school) were conducted for students who agreed to participate. The six to ten students in each focus group were asked a series of questions using a semi-structured interview schedule in relation to the play spaces in their schoolyard. The focus group discussions were conducted for 30-60 minutes in a quiet room and all discussions were audio recorded with detailed comments taken of students' focus group answers and body language during each session to aid transcription.

During the discussions, the students were asked to raise their hand when they wished to speak and each wore a name tag to assist the facilitator to ensure each participant had the opportunity to respond to each question. As part of the discussion, the students were also asked to state their name, gender, age and school year level. Focus groups were conducted until saturation of themes was reached. The focus groups were conducted by a trained facilitator that was part of the research team, using questions formulated based on a Social-Ecological Model framework and previous research evaluating students' perceptions of the environment for physical activity (Hume, Salmon, & Ball, 2005; Moore et al., 2010; Veitch, Salmon, & Ball, 2008). A sample of questions utilised, to demonstrate the application of a Social-Ecological Model framework, is presented in Table 1.

Social-Ecological Model component	Sample question
Intrapersonal (Individual)	• Do you think a safe play space is fun? • Do you think a safe play space is boring?
Interpersonal (Social)	• What would you include to play safely with your friends?
Physical Environment	• Do you feel safe in the playground where you play?
Policy/Organisational	• How supervised is your school play space?

Table 1: Sample focus group questions applying a Social-Ecological Model framework

Data Management

All focus group data was de-identified and individual identity referred to by pseudonym. Data collected from focus group sessions was transcribed verbatim and analysed using the NVivo (version 8) software package (QSR International, 2009). All audio recorded focus group and video recorded mapping sessions were transcribed by a trained transcriptionist. The analysis of the transcriptions was based upon the Social-Ecological Model framework to identify emerging themes, similarities and differences within and between the primary and secondary school groups using the NVivo feature 'nodes most frequently coded'. The information provided in the focus groups was used to determine features students included that would either facilitate or act as a barrier to physical activity. Final analyses included a review using the NVivo feature of 'nodes most frequently coded' for each focus group, to ensure themes frequently coded were included. In order to gain further insight into these features, responses for both physical activity facilitator and barrier items were categorised using a Social-Ecological Model framework (Salmon & King, 2010). Due to the consistency of perceptions between males and females, gender-specific comparisons aren't reported.

Results

The Social-Ecological Model provides a multi-level framework for teacher educators to explore the range of school playground safety influences on primary and secondary school students' physical activity. The Social-Ecological Model themes are displayed in Table 2 (intrapersonal and interpersonal influences) and Table 3 (physical environment and policy/organisational influences).

Intrapersonal (Individual) Level of Influence

The two main themes that emerged from the focus group discussions relating students' perceptions of school playground safety at the intrapersonal level included 'risk taking' (e.g. overcoming an element of danger) and 'preventing boredom' (e.g. overcoming less things to do). Overcoming an element of danger or potential for injury in the playground was regularly mentioned by both primary and secondary groups as being important to participate in physical activity (Table 2), *"I really like those jumping pillows...they might be a bit dangerous at school...but you could let like certain people on"* (Primary school student);

"…if you take the tackling out of football…that becomes boring." Many students perceived that the element of safety risk should be part of the playground and they would become bored without it; *"…a boring space…has not many things you can hurt yourself on"* (Primary school student); "*Little cushions everywhere could make things too safe and boring"* (Secondary school student); "*The only thing I like... are those things that you stand on and swing around. They…make you dizzy"* (Secondary school student). In contrast, students occasionally perceived that too much of a safety risk could negatively effect playground physical activity,*"…you don't have fun (being active) when you get hurt and you get hurt when it's dangerous"* (Primary school student).

Additionally, preventing boredom within the school playground was perceived to be important to reduce misbehaviour that could cause injury and to enhance the students' mental wellbeing (Table 2), *"...fun spaces (for activity) are on camp and not in schools"* (Primary school student); *"...with a boring space…people get really mean and stuff…use equipment they way they aren't meant to"* (Primary school student); *"...no matter what…if people are bored…people are going to break the rules and do what they want"* (Secondary school student). The occurrence of misbehaviour was also mentioned as inevitable within the school playground with so many different personalities, interests and backgrounds (Table 2).

Interpersonal (Social) Level of Influence

The themes relating to students' perceptions of school playground safety at the interpersonal level that were regularly mentioned were 'teacher responsibilities' (e.g. keeping students safe within the playground) and 'bullying/territorial issues' (e.g. intimidating others; Table 2). The threat of potential injury liability to teachers was

Social-Ecological Model Level of Influence	Primary School Groups- Comments from Individual Participants	Secondary School Groups- Comments from Individual Participants
Intrapersonal (Individual) Level of Influence	**Risk taking** *"...we have a race to the playground...run up the stairs...go down the slide...the person stops and we all get crumpled" (Year 5 boy).* *"Sometimes you are playing on the bars and want to do a new trick and might fall off" (Year 5 girl).* **Preventing boredom** *"In some cases you have a choice whether it's safe, so if you are bored and choose to be really reckless and there was a swing...you pushed it...hit someone…" (Year 5 girl).* *"People don't use the equipment right when it's boring...they can just sort of hurt someone whey they are bored…make things destructive" (Year 5 girl).*	**Risk taking** *"Fun is like taking risks and stuff...safe is like having fun but being like careful" (Year 7 boy).* *"I like hanging in trees…and on the flying fox...its fun falling off" (Year 7 boy).* **Preventing boredom** *"Change is always good…because if students are bored they will push the boundaries and make things unsafe" (Year 7 boy).* **Misbehaviour** *"…you couldn't really make a school any safer, because no matter what people are going to break rules and do whatever they want…" (Year 7 boy).*
Interpersonal (Social) Level of Influence	**Teacher responsibilities** *"...fun spaces are on camp and not in schools...in schools...it's the teacher's responsibility..." (Year 6 girl).* *"...at school it is much safer (than parks)...the teachers are in charge of you"* (Year 6 girl). **Teacher support** *"More teachers walking around making sure everything is going alright" (Year 5 girl).* **Bullying/Territorial issues** *"Most kids are mean, when I was in grade 3 I was being bullied 24/7" (Year 5 girl).*	**Teacher responsibilities** *"Instead of so controlling you need like trust. And if they do break an arm or leg they are responsible because they should know what to do" (Year 7 girl).* *"If one of us drown, because we were doing something silly, then teachers have to pay like 5 million dollars or something" (year 7 girl).* **Bullying/Territorial issues** *"Really annoying boys can chase you in the playground" (Year 7 girl).* *"There's always a fight in there (student lounge)… and if there is a*

	"Sometimes year levels don't mix and there is bullying" (Year 6 girl). **Peer support** *"Being around with friends...they can go tell a teacher...you need friends to stick up for you...because without friends or being supervised...you fall over and no one is there to help you..." (Year 5 boy).*	*fight they tell them to take it outside" (Year 7 boy).* *"It's annoying when people will just come in (to our year 7 area) and disturb us or something…if they were going to be still…it's supposed to be for year 7s but year 8s sneak in there" (Year 7 girl).* *"The reason you wouldn't feel safe is because the year 12s sit on the big one (lunge) and you don't want to sit there…" (Year 7 boy).* **Teacher intimidation** *"There is one teacher…You'll be on the flying fox and then he'll go stop it and then he'll yell the bell is about to go, run along" (Year 7 boy).*

Table 2. Primary and secondary school students' perceptions of safety within school playgrounds for physical activity at the intrapersonal and interpersonal level of influence.

perceived by students to be a key factor in a climate of 'surplus safety' within school playgrounds. The students reported that the responsibilities for teachers to ensure there is minimal safety risk within the school playground could be stifling the students' enjoyment of physical activities (Table 2). The high degree of safety within school playgrounds provided via the teachers' presence was regularly mentioned,*"...at school it is much safer (than parks)..the teachers are in charge of you"* (Primary school student); *"Your parents aren't really concerned of your safety as much as the teachers"* (Primary school student).

The bullying/territorial issues within school playgrounds was the most influential factor reported and it was often perceived that mixing with year levels to be physically active in the playground could be problematic for safety (Table 2),*"All the year 12's take up all the space and so does the year 8's and 9's and we don't even get to play"* (Secondary school student). Secondary school students also reported that the bullying would often become physical, *"I feel safe, except for within the toilets (where bullying is prevalent)..."* (Secondary school student).

With the prevalence of bullying/territorial issues and taking risks, the interpersonal influences of peer support (e.g. gaining assistance from friends) and teacher support (e.g. gaining assistance from teachers) were seen as important to be physically active within the school playground (Table 2). Peer support was seen as necessary to assist if there was an incident within an immediate play space or activity, *"I hang out with people that will stick up for you"* (Secondary school student); *"…if anyone older comes along…you've got your friends around and they (older students) are outnumbered…"* (Primary school student). Within the wider playground areas, teacher support was also seen as a crucial factor to participate in safe physical activity, *"There's always teachers out the front stopping people going down the back of the school, so if anything happens they (teachers) will be there getting help"* (Secondary school student). However, students suggested that too many teachers could stifle physical activity within the school playground, *"If there were too many teachers around you wouldn't be able to do anything, so it would be boring"* (Primary school student) and 'teacher intimidation' (e.g. threatening students) within the school playgrounds was also mentioned as negatively influencing students' wellbeing (Table 2).

Physical Environment Level of Influence

A number of themes were identified relating to students' perceptions of school playground safety at the physical environment level of influence. The importance of 'playground space' (e.g. playground area freely available & unoccupied for activities) was a common theme for the primary school students to prevent injury and collisions within the school playground (Table 3), *"...you have to be aware of where you are kicking the ball…not many little kids"* (Primary school student); *"...you have the grade 5's running into you"* (Primary school student); *"…it gets too crowded…you started knocking people over and stuff"* (Primary school student); *"You get knocked over because…kids just run past"* (Primary school student); *"…you can run around and do what you want, but some people don't like to run around and you run into them*" (Secondary school student). A common theme for the secondary school students was also the importance of 'school security' (e.g. being free from danger or threat) to feel safe to use the school playground for physical activity (Table 3).

Contrasting the existing hard-surfaced court areas within their school playground (Figures 1 & 2), primary and secondary school students both perceived a range of 'surfacing' (e.g. type of ground materials) that would be ensure they felt safe to be physically active (Table 2), *"Probably like foam underneath…or if it's an enclosed area like soft walls and*

stuff" (Secondary school student); *"if you had a playground you could probably like put woodchips in"* (Secondary school student). Examples of a secondary school synthetic grass court and fixed playground equipment with woodchips/mulch surfacing are presented in Figures 3 and 4.

Figures 1 and 2: Hard-surfaced courts within both primary school playgrounds

Figures 3 and 4: A synthetic surfaced court (Figure 3) and a fixed playground area (Figure 4) within both secondary school playgrounds

Students from both primary and secondary schools perceived that students 'wearing protective equipment' (e.g. equipment to help prevent injury) in the school playground could be useful to be physically active and to reduce the safety responsibilities on teachers (Table 3),*"...in the office there is clothes for you if you get wet, so you may as well get stuff to stop you from getting hurt"* (Primary school student)*;"...if you were going a bit fast or something you might need some protection so you don't hit the wall..."* (Primary school student).

'Weather protection' (e.g. feeling safe from the sun & cool conditions) was perceived by both the primary and secondary school groups as an important safety aspect to be physically active within the school playground (Table 3). Contrasting many of the students' school playground areas (Figures 5 & 6), the presence of trees were suggested to be important for sun protection. Another type of weather protection mentioned was protection from cool conditions.

Social-Ecological Model Level Influence	Primary School Groups- Comments from Individual Participants	Secondary School Groups- Comments from Individual Participants
Physical Environment Level of Influence	**Playground space** *"The preps play on other playgrounds...and people knock them over and stuff, because there's no room" (Year 6 girl).* *"I believe a bigger space would be better, because then you have more room to run around instead of knocking people over or hitting anyone" (Year 6 girl).* **Surfacing** *"Polished floor boards or fake grass so you won't slip" (Year 6 girl).* *"Don't put bark, because kids throw it at each other...some playgrounds have this stuff on them...when you push down it goes down a bit...instead of bark" (Year 6 girl).* *"I like the idea of synthetic grass on the basketball courts…fake grass you can bounce on" (Year 6 boy).* **Weather protection** *"Having a couple of trees so you can be in the shade" (Year 5 boy).* **Safe structures** *"...maybe the monkey bars a little less high, because they go like an arch and it's really hard to get over and you fall off. It (monkey bars) would be better to be lower and straighter" (Year 6 girl).* **Protective equipment** *"...in the office maybe have this thing where there's like possibly knee pads or elbow pads or something to make it safer" (year 6 girl).*	**School security** *"My mum doesn't want me hanging out near the fence because I could get stolen" (Year 7 girl).* *"I reckon there should be a door that scans, it opens and you walk in and it closes again" (Year 7 girl).* **Surfacing** *"...you could probably like put woodchips in, cause when you are high people don't watch what they are doing so if they fall off but there would be something cushioning underneath or something" (Year 7 girl).* *"well you could put like lots of grass there, like if you fall off or something…" (Year 7 girl).* **Weather protection** *"...on the hot days, the trees behind the bike shed make it nice and shady and cool to do activities" (Year 7 girl).* *"Depending on heaters…sometimes they are not on…and it's freezing" (Year 7 girl).* **Safe structures** *"Trampolines on the walls…we just got a 4 million dollar grant. Still have actual walls, but bring the trampolines out a bit" (Year 7 boy).* **Protective equipment** *"Helmets, padding. If they stack and break their arm you don't want them (parents) to sue you or anything" (Year 7 boy).*

	Hydration *"There should be more drink taps for when we are thirsty" (Year 6 girl).*	**Cigarette smoking protection** *"…there could be smoke detectors in the enclosed areas" (Year 7 boy).*
Policy/Organisational Level of Influence	**Designated play areas** *"I reckon you need a year level space, because then you can't have little preppies running around and you knock them over..." (Year 6 boy).* **Playground rules** *"You're not allowed to climb trees" (Year 5 boy).* **Further supervision** *"Probably like instead of two teachers on yard duty, four instead. Double the amount for more supervision" (Year 6 girl).* *"After school…there's only one teacher supervising and they can go down to the oval…and just leave ya" (Year 6 boy).* **Maintenance** *"Need more equipment and stuff, because our equipment is sort of broken" (Year 5 girl).* *"They don't put nets in the tennis courts because people will run into them and get hurt. They bounce off and it make you faster" (Year 5 boy).* *Sometimes with the basketball nets some people hang off them so they break and have to buy a new one" (Year 5 boy).* *"Fences that don't have things sticking out and stuff" (Year 5 boy).*	**Designated play areas** *"The year 7s and 8s should get their own area…cause they don't really get much…I'd probably make it a roster" (Year 7 boy).* *"Walls around the perimeter of space" (Year 7 boy).* **Playground rules** *"You could introduce punishments and guidelines… such as no running etc" (Year 7 boy).* *"…if you take the tackling out of football…that becomes boring" (Year 7 boy).* **Further supervision** *"The front isn't supervised that much and there are not really that many people around there out the front of the school" (Year 7 girl).* *"Security cameras would be useful (to monitor bullying and harassment)…" (Year 7 girl).* **Maintenance** *"Clean the toilets because they are sickening and really smell. The blow driers don't work at all" (Year 7 girl).*

Table 3. Primary and secondary school students' perceptions of safety within school playgrounds for physical activity at the physical environment and policy/organisational level of influence.


Figures 5 and 6: Example of both primary (Figure 5) and secondary (Figure 6) school playground areas without sun protection from trees

Primary school students suggested an increase in drinking taps (Figure 7) could ensure prolonged physical activity 'hydration' (e.g. drinking enough water) to decrease the risk of dehydration (Table 3). In contrast, a number of secondary school students also mentioned that the use of 'passive smoking detection' (e.g. identifying the presence of cigarette smoke) within enclosed playground areas could decrease the safety risk of passive smoking (Table 3).

Figure 7: Example of a set of drink taps within one of the primary schools playground areas

Policy/Organisational Level of Influence

'Designated play areas' (e.g. specified areas to engage in unstructured, spontaneous activities), 'extra supervision' (e.g. additional teacher presence), 'playground rules' (e.g. regulations governing the playground) and 'equipment maintenance' (e.g. keeping the playground facilities in a safe condition) were the key playground safety themes from the focus group discussions at the policy/organisational level of influence (Table 3). Students identified that having designated play areas such as a 'prep only' school playground area (Figure 8) would be important to ensure that collisions and clashes across age groupings are avoided (Table 3), "*I would actually make it so that there's a grade 6 playground, instead of a 5/6 playground so that there's more room to play"* (Primary school student); "*It's annoying when people will just come in to our year 7 area and disturb us or something"* (Secondary school student); *"You should have an area for yourself, like year 7 and year 8, but then you should have a mixed one"* (Secondary school student). Some students perceived that extra supervision would ensure they would feel safer within the playground to be physically active

(Table 3), *"The quiet areas are not really supervised, the only time there are teachers is when they walk through the corridor or when they open the door for themselves"* (Secondary school student).

Figure 8: Example of a 'prep only' school playground area at one of the primary schools

A range of rules enforced were suggested to influence students participation in safe physical activity within the school playground, including current playground rules, restrictions of sporting rules and suggestions for further playground rules for safer physical activity (Table 3).

The most common theme from both primary and secondary school groups identified within the policy/organisational level of influence relating to safe physical activity participation within the playground was 'equipment maintenance' to prevent injury (Table 3). A range of equipment maintenance suggestions were made from the students, "*...it's dangerous…to go from one platform to the other, there's a big hole in the middle. Little kids could slip and fall through there..."* (Primary school student); "*...on the platforms, because they are square, maybe make the edges like round..."* (Primary school student); *"With our soccer goals, because we don't have nets...it (ball) rolls down the hill and it's a bit of trouble to get it*" (Primary school student; Figure 9);*"With the fencing, there is a barbed wire fence...when we go running to get the ball we could run into the fence"* (Primary school student).

Figure 9: Example of an Australian Rules Football and soccer goal within one of the primary school playgrounds

Discussion

The aim of this study was to examine students' perceptions of school playground safety influences on physical activity during school breaks, based upon a Social-Ecological Model framework. There have been limited investigations employing the key components of the Social-Ecological Model of health of physical activity (Salmon & King, 2010), especially within a school context. The results of this study provide teacher educators with in-depth qualitative evidence of the intrapersonal, interpersonal, physical environment and policy levels of school playground safety influence on primary and secondary school students' physical activity during school break periods. The Social-Ecological Model themes identified by both primary and secondary school students included intrapersonal playground safety influences (risk taking, preventing boredom, misbehaviour); interpersonal playground safety influences (teacher responsibilities, teacher support, peer support, teacher intimidation and bullying/territorial issues); physical environment playground safety influences (surfacing, protection from the weather, safe structures, protective equipment, playground space, hydration, school security and passive smoking protection) and policy/organisational playground safety influences (designated play areas, playground rules, further supervision, maintenance). Highlighting the multiple levels of school playground safety influences on both late primary and early secondary school students' physical activity has the potential to inform teacher educators (schools, principals, teachers, teacher educators/academics, pre-service teachers) for future school playground interventions and planning.

Within the intrapersonal (individual) level of influence on school playground safety for physical activity risk taking and preventing boredom were identified as key factors that can influence safety school playground physical activity. Students perceived that having an element of danger to overcome was important part of being physically active which is in contrast to the 'surplus safety' notion perpetuated by adult attitudes within our modern society (Wyver et al., 2010). Risk taking is important to prevent boredom and to provide movement confidence to students that can lead to improved physical activity habits (Wyver et al., 2010). Boredom has been suggested to have negative effects on students' mental health (Armstrong, Hill, & Secker, 2000) and can lead to outbursts of frustration and anger (Gorton, 1977), which could lead to injuries within the school playground. Within the present study, students' perceived boredom would cause students to break rules and behave recklessly in a manner that could cause injury. Consequently, restricting student opportunities to take risks could be having the reverse effects for teachers that are seeking an environment protected from danger. Recent studies have also reported that despite reductions in misbehaviour and injuries within school playgrounds via introducing loose parts (Bundy et al., 2009) or eliminating all playground rules (McLachlan, 2014), teachers can perceive greater dangers to students' wellbeing than actually occur. The introduction of loose parts can also provide a variety of options and choice for students to prevent school playground boredom and is an important playground consideration for teacher education programs to consider (Bundy et al., 2009; Hyndman, Benson, & Telford, 2014)

Interpersonal (social) levels of school playground safety influence on students' physical activity included bullying and territorial issues, peer and teacher support, teacher responsibilities and teacher intimidation. With the detrimental effects of bullying on students' mental health and physical activity participation within school playgrounds, the level of bullying perceived by students within the school playground was concerning. Students across the world are being exposed to bullying and are unable to defend themselves adequately, leading to poor mental health (Pepler et al., 2006). Available evidence, although limited, indicates that bullying is inversely associated with perceptions of personal safety within the school (Beran, 2006). Similar to the present study, research suggests that bullying is the most

common reason why pupils felt unsafe in school with the most unsafe places in schools revealed to be play areas (playground and fields; Cowie, Hutson, Oztug, & Myers, 2008). Recent findings have revealed that three out of four schools where the principal had described bullying was taking place, was the lowest observed levels of physical activity during school breaks (Parrish, Yeatman, Iverson, & Russell, 2011). Within the present study, the mixing of year levels, less supervised areas and disturbance of play areas was perceived to be the major causes of playground bullying. In contrast, previous playground studies that have examined the broader influences on playground physical activity have identified that students can become intimidated by large numbers and seek quiet playground areas (Blatchford, 2012) and bullying can be attributed to having no peers to play with and not getting along with peers (Stanley, Boshoff, & Dollman, 2012). Similar to peer bullying, secondary school students at one school also mentioned the occurrence of teacher intimidation. The many intra-personal and inter-personal school playground safety themes identified by the students could inform teacher education programs to ensure pre-services teachers consider the importance of implementing further bullying surveillance and bullying prevention programs to enhance students' safety for playground physical activity.

Peer and teacher support were perceived by students to be important for both protection from bullying and to ensure that if an injury occurred that it would be appropriately accounted for. Research suggests there is a need for social interventions to focus on providing students with access to a supportive inter-personal environment to foster physical activity within school playgrounds (Parrish et al., 2011). Pre-service and in-service teachers should be made aware of programs to promote social safety via peer and teacher support strategies to ensure the health and wellbeing of students when engaging in school playground physical activity. Teachers' perceptions of school playground interventions of movable/recycled materials have revealed positive social inclusion, resilience and co-operative teamwork outcomes among students participating in the intervention (Bundy et al., 2009; Hyndman, Benson, & Telford, 2014). The use of movable/recycled materials could be a key strategy to develop social skills within school playgrounds and is therefore an important consideration for teacher educators and school decision makers.

Students' perceptions that teacher responsibilities could be stifling potential opportunities to engage in physical activity is similar to research suggesting that there is a surplus safety culture in schools (Malone, 2007; Wyver et al., 2010). Recent research has highlighted the link between teacher responsibilities and behaviours that are less enjoyable in order to fulfill professional responsibilities (Lauermann, 2014). Similarly, the present study highlights that teachers' professional responsibilities to ensure safety could also be negatively effecting students physical activity behaviours within school playground. The positive effects reported by a school principal of teachers turning a 'blind eye' in a New Zealand school to supervisory responsibilities included: a reduction in injuries and misbehaviour via the elimination of all playground rules (McLachlan, 2014). With a growing adult focus on playground safety, perhaps an approach which reduces the emphasis on safety rules and regulations could be the approach teacher education programs should be encourage.

In relation to the physical environment, school playground safety influences most widely reported to maximise participation in physical activity included: surfacing, importance of space (primary school students only), protection from the weather/shelter, school security (surveillance cameras), safe structures, protective equipment, hydration (primary school students only) and protection from passive smoking (secondary school students only). Both primary and secondary school students had a preference for a range of surfaces that included wood chips, synthetic/fake grass (to support falls) and polished floor boards (to prevent slipping). Encouragingly, many of the surfacing suggestions from students for safety were in line with Australian school playground standards that recommend 'impact-absorbing'

material such as rubber/synthetic materials and mulch/bark (Australian Playground Safety Standards, 2004). Importantly students mentioned that mulch/bark can also be a playground hazard, because students can use the bark as a dangerous projectile. Interestingly, despite the national playground standards recommending a range of 'multifunctional' spaces, the students' suggestion of including 'spacious areas' to prevent collisions and injury were a suggestion that wasn't reflected in the standards and could also be an important consideration for the standards to be updated (Australian Playground Safety Standards, 2004).

With the common use of protective equipment for students during sporting activities (Halstead & Walter, 2010), a number of primary and secondary school students suggested that protective equipment such as padding or helmets could be implemented within school playgrounds. The inclusion of protective equipment could be a useful consideration for students to take risks within the school playground. Students mentioned that other types of clothing are provided for students if they become too cold or wet, therefore schools could consider providing a box of protective equipment for school playground physical activities (e.g. elbow/knee pads, shin guards). The other alternative to protective equipment that was suggested by both primary and secondary school students was providing 'safe structures' with trampoline walls or cushioned playground equipment to protect against collisions.

Interestingly, with an increase in Sunsmart policies in Australian school playgrounds (Parrish et al., 2011), many of the primary and secondary school students suggested 'weather protection' from ultraviolet (UV) rays via tree-shaded areas could encourage safer physical activity. Within the natural environment of school playgrounds, further tree-shaded areas have been suggested to encourage a range of physical activity benefits (Dyment, Bell, & Lucas, 2009) and schools should look to implement further 'greening' playgrounds via trees and gardens. Students' perceptions that there should be more drinking taps could ensure drinking taps are more accessible around playground activities to help prevent the dangers of dehydration (Popkin, D'Anci, & Rosenberg, 2010). Furthermore, secondary school students suggested that due to the prevalence of cigarette smoking within their school playgrounds that smoke detectors could help provide students with protection from passive smoking and prevent potential respiratory dangers associated with passive smoking (Alwan, Siddiqi, Thomson, & Cameron, 2010). The installation of smoke detectors in secondary school 'smoking hotspots' is an important strategy for the provision of safer playgrounds. Secondary school students emphasised a greater need for security measures such as secure school borders and scanning doors than primary school students to feel safer in play areas near the perimeter of school grounds. The concerns surrounding 'stranger danger' continues to increase internationally within school communities (Booth, 2000) and suggests further preventative measures maybe necessary to ensure students feel safer to utilise playground areas near the perimeter of school grounds for physical activity. With many playgrounds designed by adults, understanding the range playground safety influences within the physical environment that effect students' physical activity could help inform safer school playground designs.

Regardless of what strategies are implemented at the intra-personal, inter-personal and physical environment level of influence with the Social Ecological Model framework, each level needs to be reinforced by supportive policy (Salmon & King, 2010; Wattchow et al., 2013). At the policy/organisational level of influence on students' physical activity during school breaks have been largely unexplored (Haug, Torsheim, & Samdal, 2009). Research suggests there should school policies implemented to increase opportunities for students to be physically active (Meitz et al., 2002). In the present study, designated play areas, extra supervision, playground rules and equipment maintenance were the key policy/organisational factors perceived by the students to influence their safe participation in physical activity within school playgrounds. Having designated play areas for year levels/groups was

perceived as an important policy to reduce the potential for collisions and/or bullying between different age groups. Although dividing play areas may potentially prevent injury, previous research suggests such school policies can result in students feeling that the rule is divisive, unfair and can lead to further animosity (Thompson et al., 2001). However, some students mentioned that a roster policy could be useful to ensure such a playground policy would be successful. The policy of 'further supervision' was also perceived to be important for safe playground physical activity. The students' perceptions are supported by a study that revealed that by teachers playing an active role (e.g. encouraging physical activities) during playground supervision it can dramatically increase students' playground physical activity participation (Willenberg et al., 2009). It has also been suggested that if a Physical Education or Sport Education coordinator is supervising the playground, students at some schools may also feel more inclined to demonstrate their physical skills (Willenberg et al., 2009).

Interestingly, despite the students attending school in different sectors (primary/secondary), there were distinct similarities between the primary and secondary school students' perspectives of the school playground safety influences on physical activity, in relation to the Social-Ecological Model. For educators to better understand students' physical activity behaviour, Social-Ecological Models suggest it is important to consider multiple levels of influence (Intrapersonal, Interpersonal, Physical Environment & Policy) (Salmon & King, 2010). It is important to acknowledge that the findings from the study are not generalisable to wider populations as they are only representative of the perceptions of groups of students from two primary and two secondary schools in two regional areas of Victoria.

'Maintenance' was also identified by students as being an important policy/organisational factor to ensure that the playground equipment wouldn't cause injury or danger. Students perceived that an environment where students could feel confident to explore and demonstrate their movement skills would encourage physical activity. Similar to national playground standards and guidelines (Australian Playground Safety Standards, 2004), primary and secondary school students suggested the maintenance of playground aspects such as repairing holes/gaps in equipment, removal of sharp edges or fencing, maintaining the vegetable garden and replacing sporting equipment (e.g. soccer & tennis nets, basketball rings) would encourage safer physical activity within the school playground. The students' perceptions that equipment 'maintenance' is important for safe participation in physical activity could ensure more schools adopt such a policy and ensure a staff member if responsible for assessing the safety of playground equipment on a regular basis. Similarly, the students felt that they would use the playground spaces more widely for physical activity if there were more hygienically safe toilets and that toilet hygiene could reflect the overall maintenance of their school playground e.g. if the toilets aren't maintained, the playground mustn't be maintained. The maintenance of school playground equipment has been identified as an important consideration for any school looking to develop school playgrounds to facilitate physical activity (Hyndman, Benson, & Telford, 2014).

Conclusion

This research addresses an important gap in the literature by providing useful information for teacher educators (schools, principals, teachers, teacher educators/academics, pre-service teachers) of the multiple school playground safety influences on students' participation in physical activity. The Social-Ecological Model levels of school playground safety influence on participation in physical activity identified by both primary and secondary school students included intrapersonal safety influences (risk taking, preventing boredom,

misbehaviour); interpersonal safety influences (teacher responsibilities, teacher support, peer support, teacher intimidation and bullying/territorial issues); physical environment safety influences (surfacing, protection from the weather, safe structures, protective equipment, playground space, hydration, school security and passive smoking protection) and policy/organisational safety influences (designated play areas, playground rules, further supervision, maintenance). As many school play spaces are designed by adults, the student perceptions identified from this study can inform both in-service and pre-service educators to provide safe, inclusive playground physical activity participation for school students.

References

Allender, S., Cowburn, G., & Foster, C. (2006). Understanding participation in sport and physical activity among children and adults: a review of qualitative studies. *Health Education Research, 21*(6), 826-835. http://dx.doi.org/10.1093/her/cyl063

Alwan, N., Siddiqi, K., Thomson, H., & Cameron, I. (2010). Children's exposure to second-hand smoke in the home: A household survey in the North of England. *Health & Social Care in the community, 18*(3), 257-263.

Armstrong, C., Hill, M., & Secker, J. (2000). Young people's perceptions of mental health. *Children & Society, 14*(1), 60-72. http://dx.doi.org/10.1111/j.1099-0860.2000.tb00151.x

Australian Curriculum, Assessment & Reporting Authority (ACARA). (2010). Myschool website. Retrieved March 12, 2010, from: http://www.myschool.edu.au/

Australian Curriculum, Assessment & Reporting Authority (ACARA). (2014). Health and Physical Education Curriculum. Retrieved June 19, 2014, from: http://www.australiancurriculum.edu.au/health-and-physical-education/curriculum/f-10?layout=1

Australian Institute for Training and School Leadership. (2011). National Professional Standards for Teachers. Retrieved March 25, 2011, from: http://www.aitsl.edu.au/verve/_resources/AITSL_National_Professional_Standards_for_Teachers.pdf

Australian Playground Safety Standards (2004). Playground Equipment. *Standards Australia, Australia*.

Beran, T. N. (2006). Preparing teachers to manage school bullying: The hidden curriculum. *Journal of Educational Thought, 40*(2), 119.

Berry, J. G., Jamieson, L. M., & Harrison, J. E. (2010). Head and traumatic brain injuries among Australian children, July 2000–June 2006. *Injury Prevention*, http://dx.doi.org/10.1136/ip.2009.022442.

Blatchford, P. (2012). *Social Life in School: Pupils' experiences of breaktime and recess from 7 to 16*: Routledge.

Booth, M. (2000). Assessment of physical activity: an international perspective. *Research Quarterly for Exercise and Sport, 71*(2 Suppl), S114-120. http://dx.doi.org/10.1080/02701367.2000.11082794

Bundy, A., Luckett, T., Tranter, P., Naughton, G., Wyver, S., Ragen, J., & Spies, G. (2009). The risk is that there is 'no risk': a simple, innovative intervention to increase children's activity levels. *International Journal of Early Years Education, 17*(1), 33-45. http://dx.doi.org/10.1080/09669760802699878

Chancellor, B. (2009). The Changing Face of Play in Australian Primary School Playgrounds, Doctoral Thesis, RMIT University, Melbourne.

Chancellor, B. (2013). Primary school playgrounds: features and management in Victoria, Australia. *International Journal of Play, 2*(2), 63-75. http://dx.doi.org/10.1080/21594937.2013.807568

Cowie, H., Hutson, N., Oztug, O., & Myers, C. (2008). The impact of peer support schemes on pupils' perceptions of bullying, aggression and safety at school. *Emotional and Behavioural Difficulties, 13*(1), 63-71. http://dx.doi.org/10.1080/13632750701814708

Dobbins, M., De Corby, K., Robeson, P., Husson, H., & Tirilis, D. (2009). School-based physical activity programs for promoting physical activity and fitness in children and adolescents aged 6-18. *Cochrane Database Systematic Reviews* (1), http://dx.doi.org/10.1002/14651858.CD007651

Dyment, J. E., Bell, A. C., & Lucas, A. J. (2009). The relationship between school ground design and intensity of physical activity. *Children's Geographies, 7*(3), 261-276. http://dx.doi.org/10.1080/14733280903024423

Eisenmann, J. C. (2006). Insight into the causes of the recent secular trend in pediatric obesity: Common sense does not always prevail for complex, multi-factorial phenotypes. *Preventive Medicine, 42*(5), 329-335. http://dx.doi.org/10.1016/j.ypmed.2006.02.002

Fyhri, A., & Hjorthol, R. (2009). Children's independent mobility to school, friends and leisure activities. *Journal of Transport Geography, 17*(5), 377-384. http://dx.doi.org/10.1016/j.jtrangeo.2008.10.010

Gartner, C. E., Barendregt, J. J., & Hall, W. D. (2009). Predicting the future prevalence of cigarette smoking in Australia: how low can we go and by when? *Tobacco control, 18*(3), 183-189. http://dx.doi.org/10.1136/tc.2008.027615

Gorton, R. A. (1977). Responding to student misbehavior. *NASSP Bulletin, 61*(405), 18-26. http://dx.doi.org/10.1177/019263657706140504

Halstead, M. E., & Walter, K. D. (2010). Sport-related concussion in children and adolescents. *Pediatrics, 126*(3), 597-615. http://dx.doi.org/10.1542/peds.2010-2005

Haug, E., Torsheim, T., & Samdal, O. (2009). Local school policies increase physical activity in Norwegian secondary schools. *Health Promotion International, 25*(1), 63-72. http://dx.doi.org/10.1093/heapro/dap040

Hume, C., Salmon, J., & Ball, K. (2005). Children's perceptions of their home and neighborhood environments, and their association with objectively measured physical activity: a qualitative and quantitative study. *Health Education Research, 20*(1), 1-13. http://dx.doi.org/10.1093/her/cyg095

Hyndman, B., Telford, A., Finch, C., & Benson, A. (2012). Moving Physical Activity Beyond the School Classroom: A Social-ecological Insight for Teachers of the facilitators and barriers to students' non-curricular physical activity. *Australian Journal of Teacher Education, 37*(2), 1-24. http://dx.doi.org/10.14221/ajte.2012v37n2.2

Hyndman, B., Telford, A., Finch, C.F., Ullah, S., & Benson, A.C. The Development of the Lunchtime Enjoyment of Activity and Play Questionnaire. Journal of School Health. 2013; Volume 83, Issue 4, 256-264. http://dx.doi.org/10.1111/josh.12025

Hyndman, B. P., Benson, A. C., & Telford, A. (2014). A guide for educators to move beyond conventional school playgrounds: the RE-AIM evaluation of the Lunchtime Enjoyment Activity and Play (LEAP) intervention. *Australian Journal of Teacher Education, 39*(1). http://dx.doi.org/10.14221/ajte.2014v39n1.2

Hyndman, B. P., Benson, A. C., Ullah, S., & Telford, A. (2014). Evaluating the effects of the Lunchtime Enjoyment Activity and Play (LEAP) school playground intervention on children's quality of life, enjoyment and participation in physical activity. *BMC public health, 14*(1), 164. http://dx.doi.org/10.1186/1471-2458-14-164

Hyndman, B., Telford, A., Finch, C.F., Ullah, S., & Benson, A.C. (2014). Children's enjoyment of play during school lunch breaks: An examination of intra- and inter-day reliability. *Journal of Physical Activity and Health*, 11 (1), 109-117. http://dx.doi.org/10.1123/jpah.2011-0200

Hyndman, B., Chancellor, B., & Lester, L. (2015). Exploring the seasonal influences on elementary school children's enjoyment of physical activity during school breaks. *Health Behavior and Policy Review, 2*(3), 182-193. http://dx.doi.org/10.14485/HBPR.2.3.2

Hyndman, B. (2015). Where to next for school playground interventions to encourage active play? An exploration of structured and unstructured school playground strategies. *Journal of Occupational Therapy, Schools, & Early Intervention, 8*(1), 1-12.

Lauermann, F. (2014). Teacher responsibility from the teacher's perspective. *International Journal of Educational Research, 65*, 75-89. http://dx.doi.org/10.1016/j.ijer.2013.09.005

Malone, K. (2007). The bubble-wrap generation: children growing up in walled gardens. *Environmental Education Research, 13*(4), 513-527. http://dx.doi.org/10.1080/13504620701581612

McKenzie, T. L., Prochaska, J. J., Sallis, J. F., & LaMaster, K. J. (2004). Coeducational and single-sex physical education in middle schools: impact on physical activity. *Research Quarterly for Exercise and Sport, 75*(4), 446-449. http://dx.doi.org/10.1080/02701367.2004.10609179

McLachlan, B. (2014). Project play at Swanson School. *Play and Folklore, 61*(1), 4-8.

Meitz, J. C., Edwards, S. M., Easton, D. F., Murkin, A., Ardern-Jones, A., Jackson, R. A., . . . Cancer Research, U. K. B. P. G. U. K. F. P. C. S. C. (2002). HPC2/ELAC2 polymorphisms and prostate cancer risk: analysis by age of onset of disease. *British Journal of Cancer, 87*(8), 905-908. http://dx.doi.org/10.1038/sj.bjc.6600564

Moore, J. B., Jilcott, S. B., Shores, K. A., Evenson, K. R., Brownson, R. C., & Novick, L. F. (2010). A qualitative examination of perceived barriers and facilitators of physical activity for urban and rural youth. *Health Education Research, 25*(2), 355-367. http://dx.doi.org/10.1093/her/cyq004

Nettlefold, L., McKay, H. A., Warburton, D. E., McGuire, K. A., Bredin, S. S., & Naylor, P. J. (2010). The challenge of low physical activity during the school day: at recess, lunch and in physical education. *British Journal of Sports Medicine*, http://dx.doi.org/10.1136/bjsm.2009.068072

Olds, T., Wake, M., Patton, G., Ridley, K., Waters, E., Williams, J., & Hesketh, K. (2009). How do school-day activity patterns differ with age and gender across adolescence? *Journal of Adolescent Health, 44*(1), 64-72. http://dx.doi.org/10.1016/j.jadohealth.2008.05.003

Oxford Dictionairies. (2014). The definition of playground. Retrieved June 19, 2014, from: http://www.oxforddictionaries.com/definition/english/playground

Parrish, A., Yeatman, H., Iverson., & Russell, K. (2011). Using interviews and peer pairs to better understand how school environments affect young children's playground physical activity levels: a qualitative study. *Health Education Research, 27*(2), 269-280. http://dx.doi.org/10.1093/her/cyr049

Pepler, D. J., Craig, W. M., Connolly, J. A., Yuile, A., McMaster, L., & Jiang, D. (2006). A developmental perspective on bullying. *Aggressive Behavior, 32*(4), 376-384. http://dx.doi.org/10.1002/ab.20136

Popkin, B. M., D'Anci, K. E., & Rosenberg, I. H. (2010). Water, hydration, and health. *Nutrition reviews, 68*(8), 439-458. http://dx.doi.org/10.1111/j.1753-4887.2010.00304.x

Pui-Wah, D. C., & Stimpson, P. (2004). Articulating contrasts in kindergarten teachers' implicit knowledge on play-based learning. *International Journal of Educational Research, 41*(4), 339-352. http://dx.doi.org/10.1016/j.ijer.2005.08.005

Riley, A. (2004). Evidence that school-age children can self-report on their health. *Ambulatory Pediatrics, 4*(4), 374-376. http://dx.doi.org/10.1367/A03-178R.1

Sallis, J. F., Conway, T. L., Prochaska, J. J., McKenzie, T. L., Marshall, S. J., & Brown, M. (2001). The association of school environments with youth physical activity. *American Journal of Public Health, 91*(4), 618-620. http://dx.doi.org/10.2105/AJPH.91.4.618

Salmon, J., & King, A. C. (2005). Population approaches to increasing physical activity among children and adults. *Obesity Prevention in the 21st Century: Public Health Approaches to Tackle the Obesity Epidemic*, 129-152.

Salmon, J., & King, A. C. (2010). Population approaches to increasing physical activity and reducing sedentary behavior among children and adults. In D. Crawford, R. W. Jeffery, K. Ball & J. Brug (Eds.), *Obesity epidemiology: from aeitiology to public health* (2nd ed.). New York, N.Y.: Oxford University Press. http://dx.doi.org/10.1093/acprof:oso/9780199571512.003.0012

Scott, S., Jackson, S., & Backett-Milburn, K. (1998). Swings and roundabouts: risk anxiety and the everyday worlds of children. *Sociology, 32*(4), 689-705. http://dx.doi.org/10.1177/0038038598032004004

Stanley, R. M., Boshoff, K., & Dollman, J. (2012). Voices in the playground: a qualitative exploration of the barriers and facilitators of lunchtime play. *Journal of Science and Medicine in Sport, 15*(1), 44-51. http://dx.doi.org/10.1016/j.jsams.2011.08.002

Stratton, G. (2000). Promoting children's physical activity in primary school: an intervention study using playground markings. *Ergonomics, 43*(10), 1538-1546. http://dx.doi.org/10.1080/001401300750003961

Telama, R. (2009). Tracking of physical activity from childhood to adulthood: a review. *Obesity facts*, *2*(3), 187-195. http://dx.doi.org/10.1159/000222244

Thompson, J. L., Davis, S. M., Gittelsohn, J., Going, S., Becenti, A., Metcalfe, L., . . . Ring, K. (2001). Patterns of physical activity among American Indian children: an assessment of barriers and support. *Journal of Community Health, 26*(6), 423-445. http://dx.doi.org/10.1023/A:1012507323784

Tranter, P., & Sharpe, S. (2007). Children and peak oil: an opportunity in crisis. *International Journal of Children's Rights, 15*(1), 181. http://dx.doi.org/10.1163/092755607X181748

Tranter, P. J., & Malone, K. (2004). Geographies of environmental learning: an exploration of chidlren's use of school grounds. *Children's Geographies, 2*(1), 131-155. http://dx.doi.org/10.1080/1473328032000168813

Tudor-Locke, C., Lee, S. M., Morgan, C. F., Beighle, A., & Pangrazi, R. P. (2006). Children's pedometer-determined physical activity during the segmented school day. *Medicine and Science in Sports and Exercise, 38*(10), 1732-1738. http://dx.doi.org/10.1249/01.mss.0000230212.55119.98

Veitch, J., Salmon, J., & Ball, K. (2008). Children's active free play in local neighborhoods: a behavioral mapping study. *Health Education Research, 23*(5), 870-879. http://dx.doi.org/10.1093/her/cym074

Wattchow, B., Jeanes, R., Alfrey, L., Brown, T., Cutter-Mackenzie, A., & O'Connor, J. (2013). *The socioecological educator: a 21st century renewal of physical, health, environment and outdoor education*. Springer Science & Business Media.

Willenberg, L. J., Ashbolt, R., Holland, D., Gibbs, L., MacDougall, C., Garrard, J., . . . Waters, E. (2009). Increasing school playground physical activity: a mixed methods study combining environmental measures and children's perspectives. *Journal of Science and Medicine in Sport, 13*(2), 210-216. http://dx.doi.org/10.1016/j.jsams.2009.02.011

Wyver, S., Bundy, A., Naughton, G., Tranter, P., Sandseter, E. B., & Ragan, J. (2010). Safe outdoor play for young children: Paradoxes and consequences. *Paper Code, 2071*.

Acknowledgements

The authors would like to thank the principals, teachers and parents from the two primary and two secondary schools for enabling us to invite their students to participate in the playground safety study and the students for their involvement. The researchers also thank Caroline Finch for her input into the design of the study. The data collection for this study was conducted whilst Brendon Hyndman and Amanda Telford were based at the University of Ballarat. The write up of this research was conducted at Charles Darwin University. Brendon Hyndman was originally supported during the data collection by a Ph.D scholarship from the University of Ballarat.