

Physical Activity and Behaviour in the School Context:  
Implications for Structured and Unstructured Physical Activity Settings

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## ABSTRACT

### Physical Activity and Behaviour in the School Context: Implications for Structured and Unstructured Physical Activity Settings

Lana E. Bergmame

Participation in physical activity play throughout the school day has been shown to foster improved classroom attention and behaviour among children (e.g., Jarrett et al., 1998; Pellegrini, & Davis, 1993); however, there is limited research examining the influence of intact, unstructured physical activity periods, such as recess, on children's subsequent classroom behaviours. Moreover, few studies have made behavioural comparisons of children within structured (i.e., Phys-Ed) and unstructured (i.e., recess) school physical activity contexts. As such, 21 elementary children ( $M = 10.14$  years) were observed before, during, and after school recess as well as during a Physical Education class. Self- and teacher-reported behavioural measures (BASC-2; Reynolds & Kamphaus, 2004) and a short open-ended interview with children were also completed. Paired samples t-tests revealed no differences between children's frequency of problem and adaptive behaviour pre-recess and post-recess in the classroom. As well, no differences between children's observed behaviour patterns during structured versus unstructured physical activity periods were found. However, the results indicated that children displayed enhanced behaviour patterns, on average, during recess and Phys-Ed compared to classroom periods. In addition, children described positive and negative themes in relation to recess and Phys-Ed as well as behavioural similarities and differences across contexts. These findings provide school personnel with practical

information regarding the influence of school physical activity periods on children's adaptive and problem behaviour within the elementary school setting.

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## **DEDICATION**

I dedicate this to you, mom.

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## Physical Activity and Behaviour in the School Context: Implications for Structured and Unstructured Physical activity Settings

Participation in physical activities has been shown to foster a number of important short- and long-term benefits among youth (Pellegrini, & Smith, 1998). In particular, being physically active has been linked to a variety of favourable physiological, psychological, and social outcomes in childhood and adolescence (Donaldson, & Ronan, 2006). Since exercise is an integral component of a healthy lifestyle, children and youth are encouraged to reduce the amount of time spent in sedentary activities (e.g., television viewing, video-game playing, and internet use), and to increase current physical activity levels (Public Health Agency of Canada, 2002). Almost all children attend school; therefore, the school is a key environment for the encouragement of healthy and active lifestyles (Kohl III, & Hobbs, 1998). Within the school context, opportunities for children to be physically active are commonly provided during recess and Physical Education periods. In such contexts, however, the behaviours of children with emotional and/or behavioural disorders (EBD) may pose significant challenges to school personnel (DuPaul, & Stoner, 1994).

Some research suggests that participation in physical activity may confer important benefits to children with EBD. In particular, intervention studies have indicated that physical activity may help to reduce inappropriate or disruptive behaviours, and promote prosocial behaviour, among children and youth (Basile, Motta, & Allison, 1995; Parish-Plass, & Lufi, 1997). As well, a few studies have found that opportunities for children with EBD to engage in physical activity play throughout the school day, such as during recess, may have a positive impact on their behaviour and level of concentration in the

classroom (Jarrett, et al., 1998; Rigway, Pellegrin, LaRue, & Hightshoe, 2003). Despite these findings, there is anecdotal evidence that parents and school personnel may remain skeptical about the beneficial effects of unstructured physical activity periods on children's subsequent classroom behaviours (Blatchford, 1989; Blatchford, & Sumpner, 1998). For example, some believe that eliminating recess would cut down on incidents of bullying, be less disruptive to the daily curriculum, and allow more time for academic instruction.

### **Physical Activity Play**

At the onset of this review, it is crucial to consider the developmental functions of physical activity during childhood. As Pellegrini and Smith (1998) highlighted, children's play often involves some "vigorous physical component", and as such, may be referred to as *physical activity play* (Pellegrini, & Smith, 1998, p. 577). While other forms of play, such as symbolic play, have been widely researched, the developmental implications associated with physical activity play have garnered far less attention (Pellegrini, & Smith, 1998). However, recent research in this domain demonstrates that children's physical activity levels are highly important. Physical activity participation has been linked to a variety of positive developmental outcomes, including physical, social, psychological, emotional, and intellectual benefits (Fraser-Thomas, Cote, & Deakin, 2005; Pellegrini, & Smith, 1998).

### **Definition of Physical Activity Play**

Broadly, physical activity play, like all play behaviour, is enjoyable to those involved-- typically, children and youth (Pellegrini, & Smith, 1998). Additionally, it is

“concerned with means over ends” (Pellegrini, & Smith, 1998, p. 577), and appears to “occur for its own sake” (p. 577). Physical activity play may also be either social or solitary and can involve other forms of play (for example, symbolic activity), or the inclusion of rules (Pellegrini, & Smith, 1998). It is distinguished by “a playful context combined with (...) moderate to vigorous physical activity” (Pellegrini, & Smith, 1998, p. 577). This includes behaviours, such as running, jumping, chasing, skipping, climbing, and play fighting, that raise metabolic activity “well above resting metabolic rate” (Pellegrini, & Smith, 1998, p. 577).

### **Age Trends**

According to Pellegrini and Smith (1998), physical activity play is common throughout childhood. More specifically, age trends in activity level tend to follow “three successive inverted U curves” (p. 578). Each curve reflects a different form of physical activity play: a) rhythmic stereotypies, b) exercise play, and c) rough and tumble play (Pellegrini, & Smith, 1998).

In brief, rhythmic stereotypies are gross-motor movements, such as “body rocking and foot kicking” (Pellegrini, & Smith, 1998, p. 578), displayed during infancy. As the term suggests, they are rhythmical and stereotypical actions that appear to have no overt purpose or intended goal (Pellegrini, & Smith, 1998). These behaviours typically peak in infants of about six months of age. After this point, they tend to diminish, and eventually disappear by the end of the child’s first year of life (Pellegrini, & Smith, 1998).

Exercise play subsequently emerges sometime at the end of the child’s first year (Pellegrini, & Smith, 1998). This type of play is described as “gross locomotor



movements in the context of play” (Pellegrini, & Smith, 1998, p. 578). In particular, it is characterized by vigorous physical activity that “may or may not be social” (Pellegrini, & Smith, 1998, p. 578). This form of play is quite common during early and middle childhood years. It appears to peak within during the pre-school and early elementary years, among children aged four to five years. During this period it accounts for “up to 20% of observed school recess behaviour” (Pellegrini, & Smith, 1998, p. 580). Throughout later elementary school years, instances of exercise play seem to decline. Specifically, exercise play accounted for only 13% of observed recess behaviour among children aged six to ten years (Pellegrini, 1990 as cited in Pellegrini, & Smith, 1998).

Lastly, rough and tumble play (or R & T) tends to emerge, and increase, in late pre-school or early elementary years. It is characterized by vigorous physical behaviours that would appear to be aggressive if not performed within a playful setting. More specifically, R & T play includes behaviours such as wrestling, tackling, tumbling, and kicking (Pellegrini, & Smith, 1998). Moreover, Pellegrini and Smith (1998) point out that while “exercise play may or may not be social, R & T is necessarily so” (p. 579). Typically, this form of play peaks throughout later elementary school years. More specifically, among children ages seven to eleven, it has been found to account for approximately 10% of recess behaviour (Humphreys, & Smith, 1987 as cited in Pellegrini, & Smith, 1998). Engagement in R & T play tends to subsequently decline throughout early adolescence, comprising less than 5% of play behaviours (Pellegrini, & Smith, 1998).

## **Developmental Functions**

While a defining feature of physical activity play is purposelessness, it may be considered functional. In other words, while physical activity play may not be carried out by children for any immediate purpose, it may provide important developmental functions during childhood and beyond (Pellegrini, & Smith, 1998). Broadly, *developmental functions* refer to the beneficial consequences of physical activity on human development. Importantly, Pellegrini and Smith (1998) suggested that “these consequences can be either immediate or deferred” (p. 581). More specifically, the ‘deferred-benefit’ view of play assumes that “children engage in play to learn and practice those skills necessary to be functioning adult members of society” (Pellegrini, & Smith, 1998, p. 581). Alternatively, the ‘immediate-benefit’ view of play suggests that development may only be modified during the specific time period (i.e., childhood) in which play occurs (Pellegrini, & Smith, 1998).

Generally, it is believed that each form of physical activity play serves unique developmental purposes (Pellegrini, & Smith, 1998). For example, all three forms of play appear to have important physical training functions; however, these benefits vary according the age of children, and the form of play in which they are participating. Exercise and rough and tumble play, for example, may aid in the development of endurance and muscle strength during childhood (Pellegrini, & Smith, 1998).

Pellegrini and Smith (1998) also highlighted that rough and tumble play may serve several social functions during childhood. In particular, it may provide children (particularly boys) with a way to assess the strength and dominance of others. During

early adolescence, this form of play may also play a role in establishing dominance, status, or popularity among boys within their peers groups (Pellegrini, & Smith, 1998).

Further, physical activity play appears to have important psychological and cognitive functions for children and youth. According to the *cognitive immaturity hypothesis*, for example, children's immature nervous systems are sensitive to interference from extraneous information (Bjorklund, 1997). As such, "their working memories are often cluttered (...) leaving less mental capacity for task relevant information or for the execution of cognitive strategies" (Pellegrini, & Smith, 1998). It is therefore suggested that allowing a break, or change in activity, may help to rid children of this interference (Bjorklund, 1997; Pellegrini, & Smith, 1998). In other words, the benefit of physical activity play within the school context is said to be derived from a break from challenging cognitive tasks (Bjorklund, & Douglas-Brown, 1998).

However, in relation to the functional benefits of physical activity play on children's subsequent classroom behaviour, there appear to be varied and conflicting viewpoints. Some studies have demonstrated the effectiveness of physical activity in reducing inappropriate or disruptive behaviours among students (for e.g., Basile et al., 1995; Parish-Plass, & Lufi, 1997). Informal discussions with parents, educators, and school administrators, on the other hand, suggest that children may become more riled up after participating in unstructured physical activities, exhibiting more disruptive and less on-task behaviour in the classroom. Within the school setting, physical activity play is most evident during break periods that typically occur on the school playground during

recess (Pellegrini, & Smith, 1998). As such, research in this domain has typically concentrated on the effects of recess periods on students' subsequent behaviour patterns.

### **The' Recess Debate'**

According to Pellegrini and Smith (1993), the term 'recess' generally refers to "a break period, typically outdoors, for children" (p. 51). Two primary features of this period are that it is typically unstructured and self-directed by students (Waite-Stupainsky, & Findlay, 2001). That is, recess is one of the few places within the school context in which children have the liberty to decide what activities they will participate in, and with whom.

Recess is often recognized as an integral part of children's overall educational experience (National Association for Sport and Physical Education, 2001, 2006). According to Pellegrini (2005), the main rationale behind this school break period is rather simple: It may help children to be "more productive" (p. 2). Additionally, it is believed to provide unique opportunities for children's development of cooperation skills, conflict resolution strategies, and other valuable social skills (Jarrett, et al., 1998; Waite-Stupainsky, & Findlay, 2001).

Moreover, recess is a context that provides children with important opportunities to be physically active. It has been previously reported that 60 % of school-aged children participate in some form of active play during recess (Pellegrini & Smith, 1993). More recently, two Europe studies have further described these physical activity patterns. In the first study, it was found that Portuguese school children, aged 6 to 10 years, spent about half of a 30-minute recess period participating in moderate to vigorous physical activities

(Lopes, Vasques, Beatriz, Leite de Oliveira Pereira, & Maia, 2006). These were performed in short bursts and interspersed with periods of no or minimal activity. In a second study, it was found that 8 to 10 year old children from France, when provided with two 15-minute recess periods per day, spent between 16.9 and 22.8 minutes (on average) engaged in moderate to vigorous activity (Guinhouya, Herbert, Dupont, & Durocher, 2005). Given that physical activity confers important health benefits to children and youth (National Association for Sport and Physical Education, 2001), such findings merit consideration.

Overall, recess, like Physical Education, is believed to help promote children's healthy physical development and enjoyment of movement; however, it is also considered to be separate and distinct from more structured instructional physical activity programs (National Association for Sport and Physical Education, 2001). In fact, the opportunities provided for unstructured physical activity play during recess are thought, by some, to confer benefits to children that are above and beyond those provided by school Physical Education classes (National Association for Sport and Physical Education, 2001).

Despite these positive implications, recess may, at times, also be considered problematic (Blatchford, & Sumpner, 1998). Negative views of recess may arise from knowledge of research demonstrating that aggression and bullying within the school context most often occur on the playground (Smith, & Sharp, 1994 as cited in Blatchford, & Sumpner, 1998). Moreover, some contend that recess is disruptive, and a waste of valuable educational time (Blatchford, & Sumpner, 1998; Pellegrini, 1995). In particular,

they highlight that teachers must often expend much time and effort towards calming children down upon returning to the classroom from vigorous playground activity (Blatchford, 1989; Blatchford, & Sumpner, 1998). Given the current trend towards educational accountability, such viewpoints have received more attention in recent years (Pellegrini, 2005). Specifically, more and more research has investigated the effects and functions of school recess periods; particularly, the impact of such breaks on children's classroom behaviours.

### **Recess and Classroom Behaviour**

Pellegrini and Davis (1993), for example, examined the effects of long and short periods of classroom confinement on typically developing children's recess and post-recess behaviours. More specifically, over 14 weeks, direct classroom observations of 23 children in Grade 3 were completed immediately before and after an unstructured recess period. The amount of time children spent in the classroom before recess was manipulated by the researchers so that children's classroom behaviours (i.e., on-task behaviour, restlessness) could be observed following long and short periods of classroom confinement. Long confinement periods consisted of three hours of in-class seatwork, while short periods consisted of two and a half hours of seatwork. The results indicated that children displayed increased restlessness (i.e., more fidgeting and poorer concentration) following longer periods of classroom confinement, or 'recess deprivation'. As well, long periods of confinement were related to more frequent, and more vigorous, activity during the recess periods. Upon returning to the classroom setting, children who had selected, and engaged in, more vigorous physical activity

during recess also appeared to be less attentive than those who participated in less active games or tasks (Pellegrini, & Davis, 1993).

Similarly, Pellegrini, Huberty, and Jones (1995) examined the effects of varying recess time on children's classroom and recess behaviours. A total of 62 typically developing children from three grade levels (kindergarten, Grade 2, and Grade 4) participated in the study. For two months, recess timing was varied by 30 minutes on four days of the week (Monday through Thursday), such that children had recess at 10:00 am twice a week (short recess deprivation), and 10:30 am twice a week (long recess deprivation). Using a scan sampling method of observation, on each day, children were observed in the classroom for 20 minutes before and after recess, as well as for 20 minutes during the recess period. Separate indoor (pre-, post- recess) and outdoor (recess) coding schemes were employed to record the behaviours of each child. In the classroom, children's inattention was determined by the direction of their gaze either towards, or away from, the teacher or a specific classroom activity. During recess, children's activity levels were recorded using Eaton, Enns and Pressé's (1987) Scheme for Observing Activity Level. Overall, it was found that on longer confinement days, children were more inattentive before recess. After recess, however, children's inattention seemed to improve, regardless of the length of the recess deprivation. Additionally, all children were observed to be more active following longer periods of confinement, in comparison to shorter periods (Pellegrini et al., 1995).

More recently, Barros, Silver and Stein (2009) also examined the impact of recess on the classroom behaviours of elementary school children. Unlike the previous two

studies outlined, the researchers of this study compared the group classroom behaviour of students receiving recess on a daily basis to those that were not. In addition, behaviour was evaluated in relation to children's degree of recess exposure. This was carried out through the use of public data from the Early Childhood Longitudinal Study (ECLS-K; sponsored by the US Department of Education). First, the students were divided into two groups according to their level of recess exposure: those receiving none or minimal break (less than one recess period, 15 minutes a day), and those receiving some recess. The 'some recess' group was then further divided into levels of exposure according to the frequency and duration of the recess periods provided. Group classroom behaviour was assessed using the Teacher's Rating of Classroom Behavior (TRCB) whereby teachers evaluated behaviour using a 5-point rating scale ranging from 1 (indicating frequent misbehaviour) to 5 (indicating exceptional behaviour). In total, complete data for between 10,301 and 11,624 Grade 3 students (depending on the variables examined) were analyzed and compared. Overall, both frequency analyses and multivariate regression analyses revealed that teachers' ratings of group classroom behaviour were more favourable for children receiving some recess, compared to those receiving none or minimal recess throughout the school day. Further analyses of children receiving some recess, however, demonstrated no significant differences in behaviour scores across the varying levels of recess exposure. Although this study may have important implications for the role of recess within the school context, the researchers caution that the findings may be subject to teachers' biases about recess. As noted by the authors, "teachers whose classes had recess might feel differently about the behaviour of students in their



classroom because they also might benefit from the break” (Barros, et al., 2009, p. 435). Moreover, important questions remain regarding the effect of recess on individual classroom behaviour—that is, if there are individual differences among students in relation to the impact of recess on their classroom behaviour.

Taken together, each of these studies may further highlight the developmental importance of physical activity play, and its potential implications within the school context. Additionally, the work of Pellegrini and Davis (1993), and Pellegrini, Huberty, and Jones (1995) has provided evidence that children may physically compensate when denied opportunities for active play. For some, however, such studies may also present a paradox in relation to children’s behaviour and level of attention following periods of vigorous physical activity. To clarify such topics, further research is necessary. In addition, since research within this domain has primarily focused on the effects of recess on typically developing children’s subsequent classroom behaviour, important questions remain regarding the impact of physical activity periods, such as recess, on the classroom behaviours of children with emotional and/or behavioural difficulties, or EBD. The following section will define and provide a general overview of what is meant by this term.

### **Childhood Emotional and/or Behavioural Difficulties**

#### **Definition**

Emotional and behavioural difficulties in childhood can be conveyed through a wide range of expressions and feelings. As such, the EBD spectrum is broad, and

includes childhood characteristics that range from mildly deviant to severely disturbed. Reflecting this diversity, various definitions of EBD have been proposed.

Further, definitions of childhood EBD vary according to the source, as well as the purpose of the description. According to Cullinan (2004), they are primarily devised for “research, authoritative, or administrative purposes” (p. 41). Of particular importance are administrative definitions, which are conceived and adopted by the institutions responsible for the management of services for individuals with EBD (Cullinan, 2004). In 2004, for example, the US federal government reauthorized a law known as the Individual with Disabilities Education Act (IDEA; U.S. Department of Education, 2007). IDEA is primarily responsible for ensuring that children with disabilities are provided with appropriate educational services (U.S. Department of Education, 2008). Under this law, students with EBD likely qualify for special education services under the *emotional disturbance* category of disability (Cullinan, 2004). According to the definition stipulated in IDEA, emotional disturbance is a condition in which one or more of the following characteristics are exhibited to a marked extent over a lengthy period of time: “(a) an inability to learn that cannot be explained by intellectual, sensory, or health factors, (b) an inability to build or maintain satisfactory interpersonal relationships with peers and teachers, (c) inappropriate types of behaviour or feelings under normal circumstances, (d) a general pervasive mood of unhappiness or depression, and (e) a tendency to develop physical symptoms or fears associated with personal or school problems” (U.S. Department of Education, 1998 as cited in Cullinan, 2004, p. 42). While this definition currently has extensive implications for children with emotional and/or behavioural

concerns in the United States, it has been thoroughly criticized. In response to such criticisms, professional and child advocacy groups have cooperated to propose alternate definitions of EBD (Cullinan, 2004). The National Mental Health and Special Education Coalition, for example, describe EBD as “a disability characterized by behavioural or emotional responses in school so different from appropriate age, cultural or ethnic norms that they adversely affect educational performance” (Forness & Knitzer, 1992, as cited in Cullinan, 2004, p. 45). Further, to be classified as EBD, such responses must be unaffected by direct school intervention, and exhibited, over time, within at least two different settings-- one of which must be school-related (Forness & Knitzer, 1992 as cited in Cullinan, 2004). As in the United States, no single definition of EBD is currently used within a Canadian context; however, components of the definitions outlined above are also commonly applied within Canadian schools (e.g., Smith, Polloway, Patton, Dowdy, & Heath, 2001).

### **Prevalence**

Since many individuals have differing ideas about the definition of EBD, the number of children identified as having such difficulties also varies. Specifically, percent estimates have ranged from only 1% to nearly 40% of the entire school-aged child population (Blanchard, Gurka, & Blackman, 2006). More recently, however, health surveys have documented high rates of emotional, behavioural, and developmental difficulties among children and youth. Data obtained from the 2003 National Survey of Children’s Health, for example, revealed that American children aged 6 to 17 years were most commonly diagnosed with learning disabilities (11.5%), attention

deficit/hyperactivity disorder (ADHD; 8.8%), and behavioural concerns (6.3 %; Blanchard et al., 2006).

Similarly, reported estimates of emotional and behavioural problems among Canadian school-aged children are quite high (Canadian Institute of Child Health [CICH], 2001). Based on the data of several national surveys (including the 1994-95 National Longitudinal Survey of Children and Youth, 1996-97 National Population Health Survey, and 1998 Health Behaviours of School-Aged Children Survey), it is estimated that up to 24% of boys, and 17% of girls between the ages of 4 and 11 years have at least one emotional or behavioural disorder (Canadian Institute of Child Health, 2001). Moreover, according to parent reports of child behaviour, up to 51 % of boys, and 35% of girls display signs of poor concentration; 51% of boys and 37% appear restless or hyperactive; 30% of boys and 27% of girls are described as nervous or edgy; 71 % of boys and 68% of girls are believed to argue excessively; and lastly, that up to 52% of boys and 48% of girls are thought to be stubborn, and/or short-tempered (CICH, 2001). Overall, such high estimates may provide some evidence for the co-morbidity of multiple emotional and/ or behavioural symptoms among Canadian children.

The prevalence and severity of childhood EBD has also been studied among children and youth in Quebec. For example, out of 362 Quebec school-children receiving complementary educational services for behaviour difficulties, Déry, Toupin, Pauzé, and Verlaan (2007) found that nearly 85% had Attention-Deficit Hyperactivity Disorder (ADHD), 60% met the criteria for oppositional defiant disorder (ODD), and 40% for conduct disorder (CD). Interestingly, the majority of students identified as having a

behaviour disorder (including ODD or CD) also had ADHD. Further, almost 40% of the students displayed anti-social traits (Déry et al., 2007 as cited in Ministère de l'Éducation, du Loisir et du Sport [MELS], 2008).

### **Characteristics of EBD**

Generally, EBD is conceptualized using two separate categories of behaviour: a) externalizing, and b) internalizing symptoms (Kauffman, Brigham, & Mock, 2004). Externalizing symptoms are related to conduct and disruptive disorders, and include behaviours such as noncompliance, aggression, and tantrums; while internalizing symptoms are related to emotion and mood disorders, and include characteristics such as depression, excessive shyness and anxiety (Kauffman et al., 2004; Macklem, 2008). Most often, children identified with EBD demonstrate externalizing behaviour; although, many children manifest internalizing symptoms. Since children who display internalizing symptoms may be less likely to interfere with instruction and learning within the school context, EBD may go undetected (Hunter-Carsch, Tiknaz, Cooper, & Sage, 2006). Conversely, EBD revealed in the form of disruptive, externalizing behaviours are more easily identified within the school context (Hunter-Carsch et al., 2006). Further, research suggests that there may be gender differences in relation to children's display of externalizing and internalizing symptoms. Specifically, internalizing disorders, such as depression and generalized anxiety disorder, are more common among girls; whereas externalizing disorders, such as ADHD and oppositional defiant disorder, are more frequently diagnosed among boys (Marmorstein, 2007; Simonoff et al., 1997). It is unclear, however, whether such disorders should, in fact, be differentially associated for

boys and girls. For example, Marmorstein (2007) highlights the possibility that boys who experience anxiety or depression may feel societal pressure to hide such feelings, and do so by engaging in disruptive behaviours. Girls, on the other hand, may not experience such pressure, and as such, may be less likely to act-out (Marmorstein, 2007).

Along similar lines, Kauffman and colleagues (2004) highlighted recent empirical evidence suggesting that externalizing and internalizing behaviour categories are “less clearly defined than originally thought” (p. 18). In particular, there is support for the notion that children with EBD tend to display characteristics across multiple behaviour categories (Kauffman et al., 2004; Marmorstein, 2007; Macklem, 2008). In other words, children exhibiting externalizing behaviour may concurrently experience internalizing symptoms. For example, some research has found strong positive associations between all externalizing disorders (i.e., ADHD, oppositional defiant disorder, and conduct disorder) and a range of anxiety disorders, including social phobia, generalized anxiety disorder, and overanxious disorder (Marmorstein, 2007).

### **Recess: Implications for Children with EBD**

It is possible that the effects of physical activity on children’s subsequent behaviour patterns may be influenced by the presence of an emotional and/or behavioural disorder. Upon completing an extensive literature search, however, only two relevant studies examining this topic were located (Jarrett et al., 1998; Rigway et al., 2003).

The first study by Jarrett and colleagues (1998), aimed to determine the impact of recess on the classroom behaviours of children who were not normally provided with a recess break. This research was conducted within a school setting in which children

participated in structured Physical Education classes three times per week, but were typically provided with no physical activity on the remaining days of the week. On days without Phys-Ed, classrooms were randomly assigned one day of recess and one without. To investigate the group effects and individual differences among children in relation to the impact of recess on classroom behaviour, a total of 43 students from two Grade 4 classes were observed on recess and non-recess days. Included within the sample were five children who had been diagnosed with, and were receiving medication for ADD. On the days that recess was provided, all children took a break from their regular school work (i.e., math or science) to go outside for approximately 20 minutes (10:30 am to 10:50 am). The recess period took place either on the school playground or at a public playground located across the street. Each context had swings and monkey bars; however no loose equipment was provided to students. On both recess and non-recess school days, children were observed in the classroom from about 10:00 to 10:25 am, and again from 10:50 to 11:15 am. Using five second intervals, research assistants sequentially observed and recorded the classroom behaviours of each child. In particular, behaviours were coded for instances of on-task behaviour, excessive and repetitive movements (or fidgeting), as well as inattention.

While the results indicated that the majority of the students benefited to some degree from the inclusion of recess, it was found that 60% of the children benefited considerably. That is, they displayed significantly more on-task behaviour or less fidgeting subsequent to the recess period (on recess compared to non-recess days). Additionally, all five of the students diagnosed with ADD appeared to benefit from the

recess break, with one student displaying more on-task behaviour, two displaying less fidgeting, and two displaying less fidgeting as well as more on-task behaviour. Children's level of inattentive behaviour, on the other hand, did not differ on recess compared to non-recess days.

While positive trends in children's behaviour were highlighted, the researchers identified six children whose behaviours seemed to worsen (i.e., became less on-task or more fidgety) when provided with a recess break. One explanation for this finding, as outlined by the researchers, may be that children's unique playground behaviours and activity levels have differential effects on their subsequent classroom behaviours. This explanation could not be confirmed or disconfirmed, however, because participants' playground behaviours were not observed or documented within the study. The researchers further acknowledged that transitions back to the classroom following the recess period may be difficult for some children, perhaps especially those that are in need of more structure and consistency in their lives. In total, 12 participants were dropped from the sample due to insufficient data, and seven of these children were from transient housing. As the researchers note, it is unknown whether or not these participants would have demonstrated this pattern of behaviour (Jarrett et al., 1998).

Similar to the research noted above, a second study by Rigway and colleagues (2003) also assessed the effects of a traditional recess period on the subsequent classroom behaviours of children with a diagnosis of ADHD. A total of three 8-year-old boys receiving stimulant medication for ADHD took part in the study. As well, in order to form a matched peer group of typically developing boys, three children from each of the



primary participants' classrooms were nominated by teachers. In other words, three different peer groups (each consisting of three children) were matched to the children with ADHD. In this study, a 10-minute outdoor morning (i.e., 9:45 am) recess period was introduced to all children on alternating days of the week. During the recess period, a variety of outdoor materials, such as skipping ropes, hula hoops and balls, were provided to the children. Recess was considered to be an opportunity for free play and adults only interceded if dangerous or inappropriate behaviour took place. On recess and non-recess days, all participants were observed in their classrooms at three different time points before recess (8:30 am, 9:00 am, and 9:35 am), as well as after-recess (10:10, 10:30, and 10:50 am). To clarify, the observations at 9:35 and 10:10 occurred immediately before and after the recess period. Observations of five target behaviours (i.e., inappropriate speech, fidgeting, playing with materials, out- of- seat, and off-task behaviour) took place over three days using a 10-second partial interval recording procedure. Overall, the researchers found that all participants (i.e., ADHD and matched peers) consistently displayed more inappropriate behaviours on days in which they did not have recess (in comparison to days on which recess was provided). Moreover, participants' level of disruptive behaviour progressively increased on days without recess (Rigway et al., 2003).

Like Jarrett, and colleagues (1998), the researchers of this study also note some individual differences in the effects of recess on the participants' classroom behaviour. For example, while two of the three boys with ADHD displayed clear post-recess reductions in inappropriate behaviour on days in which recess was provided, the third

participant exhibited improvements to a lesser extent (Rigway et al., 2003). Although these findings appear quite promising, future studies incorporating children with EBD are warranted. Specifically, there has been a limited amount (or lack of) systematic investigation into the effects of intact school recess periods on the subsequent classroom behaviours (i.e., pre-post recess comparisons) of children with and without EBD. Moreover, further investigation into the effects of various types of physical activities, as well as the structure of the physical activity contexts, on children's behaviour is of value.

Overall, it is likely that the functions of physical activity periods throughout the school day vary across individuals. In fact, given that treatment planning for students with diagnoses of emotional and/or behavioural disorders must be highly individualized (DuPaul, Eckert, & McGoey, 1997), differential effects of physical activity on children's behaviour may be expected. It is valuable to consider the unique features of children with EBD and the contextual features of the environment in order to better understand the impact of physical activity contexts on their behaviour.

### **Behavioural Variations across Structured and Unstructured Contexts**

A useful framework for further examining the impact of physical activity contexts on children's behaviour is Urie Bronfenbrenner's (2005) *Bioecological Systems* perspective. According to this theory, human development is a process by which systematic and progressive changes emerge from the complex and reciprocal interactions between a developing individual and the contexts in which he or she engages (Bronfenbrenner, 2005). As such, behavioural variations among individuals arise out of the interplay between both internal systems (i.e., genetically determined biological traits,

emotional regulation, etc.), as well as external systems (i.e., people, objects and symbols within the environment). To produce an effect on development, interactions between an individual's internal and external systems must occur consistently and over an extended time frame. These long-lasting types of interaction within the immediate environment are known as proximal processes, and are considered the "primary engines of development" (Bronfenbrenner, 2005, p. 6). To provide a few examples, such proximal processes include both adult-child interactions (e.g., a parent nurturing and comforting a baby), as well as child-child activities (e.g., group or solitary play, athletic activities), among others.

It is possible that the complex and reciprocal interactions between the internal characteristics of children (e.g., emotional self-regulation, behavioural inhibition) and the features of physical activity contexts (e.g., structure) produce unique and varied effects on their behaviour in the school context. The research to date has focused on children with ADHD; therefore, the following section will outline how internal characteristics of children with ADHD may be impacted by the structured and unstructured features of physical activity settings.

### **ADHD and Behavioural Inhibition: Implications for Structured and Unstructured Contexts**

Simply stated, ADHD is a developmental disorder that is typically characterized by distractibility, hyperactivity, poor sustained attention, and impulsivity (Barkley, 2000). According to Barkley (1997) a core deficit associated with the behaviours exhibited by children with ADHD is *behavioural inhibition*. Behavioural inhibition may be described

as the opposite of impulsivity. More specifically, it refers to three interconnected processes: the ability to a) inhibit a response to an event for which instant reinforcement is present; b) stop an ongoing response (and delay a decision to respond); and c) display control interference – or protect periods of delay “from disruption by competing events and responses” (Barkley, 1997, p. 67). Deficits in inhibition may also be linked to a variety of secondary deficits, including poorer performance in the areas of “working memory, internalization of speech, self-regulation or affect-motivation-arousal, and reconstitution” (Crundwell, 2005, p. 63). It is believed that each of these functional deficits may also have a direct impact on children’s expression of behavioural difficulties, and as such, their ability to engage in “appropriate social behaviour and interactions” (Crundwell, 2005, p. 63). Some research has found, for example, that children with ADHD tend to express a higher degree of negativity while communicating with peers in social contexts (Pelham, & Bender, 1982). Moreover, it has been suggested that as the degree of their negative emotional state (and self regulation difficulties) increase, children’s degree of behavioural difficulty also escalates (Crundwell, 2005). Since most physical activity contexts are inevitably social, these features of ADHD are valuable to consider. Further, they are likely to play an important role in children’s ability to ‘behaviourally recover’ from vigorous, and highly-stimulating, physical activities. It is therefore possible that children with such deficits may exhibit problem behaviours to a greater extent both during, as well as immediately following periods of unstructured physical activity play, such as recess.

As Litner and Ostiguy (2000) pointed out, the appropriate structuring of leisure time for children with ADHD may pose significant challenges to educators. Clearly, breaks throughout the school day are important, whether or not they take place outside, and in the form of recess. Overall, it is suggested that children with ADHD may derive benefits from physical activity programs that are more highly structured (Litner, & Ostiguy, 2000). In fact, structure and consistency are considered to be two critical elements of success in any program designed for children with ADHD (Litner, & Ostiguy, 2000). A structured approach is one that emphasizes a predictable routine, and ensures that expectations and consequences of behaviour are made explicit (Litner, & Ostiguy, 2000). Overall, physical activity settings that incorporate these features may be likely to provide greater opportunities for participation, and success, among children with behavioural concerns. Some empirical evidence for the effectiveness of more structured physical activity programs for children with EBD can be drawn from the extant intervention literature. The following section will provide a brief overview of this body of research.

### **Physical Activity Interventions for EBD**

It is believed that the successful implementation of any EBD intervention may be impacted by perceived acceptability of treatments by significant adults; that is, the extent to the adults involved (such as parents and teachers) believe in the treatment employed (Krain, Kendall, & Power, 2005). More specifically, some research suggests that families, educators, and child care workers “are more likely to initiate, and adhere to, interventions that they perceive as acceptable” (Krain et al., 2005). In light of these

findings, several factors have been identified, which may influence an individual's perception of treatment acceptability (Reimers, Wacker & Cooper, 1991). These include, the potential side effects of the treatment, its overall usefulness, the severity of the problem it is to address, the length of time needed to fully implement it, and the nature of the treatment approach (i.e., a positive or negative orientation). Generally, interventions considered to be most acceptable are those that have very few or no associated side-effects, are effective, easy to execute, and positively-oriented (Reimers et al., 1991).

Considering each of these factors, it seems reasonable to assert that physical activity interventions for childhood EBD would be deemed acceptable by parents, as well as school personnel. Since physical activity typically occurs naturally as a form of play in early childhood (Pellegrini, & Smith, 1998), it may be thought of as an efficient, and economical, treatment approach for childhood populations. Moreover, physical activity interventions can be considered positive in nature, as they are more likely to be used to prevent, rather than punish, challenging behaviours. In fact, given the numerous benefits to being physically active, and the negative consequences associated with inactivity, this treatment strategy may be of particular value.

While the literature is not extensive, some studies have investigated the usefulness of physical activity interventions for children exhibiting emotional and behavioural concerns (e.g., Armstrong & Drabman 1994; Hupp & Reitman, 1999, Parish-Plass and Lufi, 1997). Much of this research is based on previous studies that have linked increased physical activity participation to enhanced emotional and behavioural well-being among typically-developing children and youth (for e.g., Donaldson, & Ronan, 2006). Within

the extant literature, similar findings have been noted for children with behavioural concerns.

In particular, case studies have highlighted the benefits of sports skill tutoring for youth with EBD. For example, Armstrong and Drabman (1994) examined the impact of a sport skill program on social, emotional and behavioural outcomes of elementary school boys who were referred due to behavioural concerns. This program involved the participation of high school or college students who supervised and guided sport practice sessions. The sessions were designed to enhance the referred students' skills in a specific sport. Overall, a link between improved sport performance and greater incidence of positive social interactions, as well as increased levels of happiness, self-efficacy and confidence was noted. Additionally, the findings suggested that enhanced sport performance may be related to greater persistence and fewer attention seeking behaviours among boys in the classroom setting (Armstrong, & Drabman, 1994).

Similarly, Hupp and Reitman (1999) evaluated the impact of a sport skill and sportsmanship training program on the behaviours of three children with ADHD. In this study, children participated in a summer basketball camp, which emphasized both basketball skill acquisition as well as good sportsmanship. Children participated in the program for one and a half hours per day over three weeks (15 days). Sportsmanship was reinforced through the use of a token system. In total, two 8 year-olds, and one 10 year-old were selected for inclusion in the study. Their selection was based on their ages (between 8 and 11 years), as well as their willingness to participate. Overall, the program appeared to increase children's sportsmanlike behaviours (e.g., the initiation of verbal

praise or encouragement) and decrease poor sportsmanship, as well as improve some aspects of sport performance (e.g., increased passing and fewer dribbling errors).

Other researchers, such as Parish-Plass and Lufi (1997), have also examined the usefulness of implementing a physical activity program, along with a behavioural intervention, to address behavioural problems in childhood. Specifically, 43 boys from Israel, aged 8 to 13 years, took part in an intervention over the course of one school year. The intervention involved a weekly group therapy session led by two child psychologists. Each session consisted of participation in pre-planned individual sport activities, as well as team games. Such physical activities were preceded and followed by a group discussion period. As well, during each physical activity session, various behavioural techniques were used to promote appropriate behaviours, and deter problematic behaviours, from occurring. These strategies included positive reinforcement, cuing, the creation of a token economy, modelling, and social skills training (Parish-Plass, & Lufi, 1997). Overall, pre-/post-intervention comparisons revealed significantly fewer problem behaviours among the boys with behavioural concerns after the implementation of this combined physical activity and behavioural intervention (Parish-Plass, & Lufi, 1997). While this finding provides initial support for the therapeutic value of a combined physical activity and behavioural intervention, it is unclear as to which component of the intervention (e.g., behavioural therapy/group discussion or physical activity) had the greatest impact on behaviour.

Antecedent exercise has also been used to address a variety of psychological and behavioural concerns among school-aged children and youth (Bachman & Fuqua, 1983;



Basile, Motta, & Allison, 1995; Lochbaum & Crews, 2003). To clarify, antecedent exercise refers to physical activity that is “delivered with the intent of reducing later behaviour problems” (Basile et al., 1995, p. 120). According to Basile et al. (1995), there is clear evidence for the effectiveness of antecedent exercise in reducing a variety of undesirable behaviours, including aggressive, hyperactive, self-stimulatory, and self-harming behaviours, along with a variety of activities considered disruptive to the classroom. In particular, antecedent exercise has been found to successfully reduce disruptive classroom behaviours across a wide range of individuals, including developmentally disabled adults and children, as well as children who display emotional and/or behavioural disorders (Basile et al., 1995).

To understand the effects of antecedent exercise on children’s self concept, and rates of disruptive behaviours, Basile and colleagues (1995), for example, studied 58 children between the ages of 7 and 13 with a diagnosed behaviour disorder (e.g., Oppositional Defiant Disorder, Conduct disorder, and ADHD) . Specifically, the children were randomly assigned to one of three treatment conditions: a) antecedent exercise, b) a no-exercise mastery task, and c) a control group. Those within the control group remained in their classroom without receiving any treatment. The children in the antecedent exercise condition participated in intervals of rapid walking and vigorous jogging, while listening to popular music. Children in the mastery task condition, on the other hand, practiced shooting miniature basketballs from increasing distances, and various angles, into a small hoop. Each session (of the treatment and mastery conditions) lasted 20 minutes, and was repeated four times a week, across span of four weeks. Upon

completion of the session, all children were promptly brought back to their classroom. Subsequently, between one and three hours after the session, children were observed within their classrooms using a partial interval time sampling method. Comparisons of baseline and post-treatment classroom observations revealed that antecedent exercise effectively reduced disruptive classroom behaviours (including time off-task, aggression, inappropriate vocalizations, etc.), while the mastery task and control conditions had no apparent effects on behaviour (Basile et al., 1995). The researchers postulate that the effects of antecedent exercise on behaviour may be achieved through “non-specific” factors such as increased social reinforcement (e.g., praise or rewards and social interactions); however further research is necessary to examine these and other potential “mechanisms of action” (Basile et al., 1995, p. 136).

Overall, such research findings are quite promising and provide some support for the inclusion of physical activity in the intervention planning for children with emotional and behavioural difficulties. Despite differences in the nature, duration, frequency, and intensity of the interventions employed, some positive results have been highlighted. A common feature, demonstrated in many of the studies, is the imposed structure of the intervention, specifically, in terms of the particular physical activities selected by the experimenter. This feature, and children’s subsequent level of motivation or interest in the activities, may have an important impact on the effectiveness of the intervention employed. To better understand such factors, and other factors that may be associated with successful outcomes for children with EBD in physical activity contexts, further research is warranted.

## Summary

Taken together, all of these findings -- those describing the impact of structured as well as unstructured physical activity on children's behaviours -- may have important implications within the school context. Further, this research may be of particular value to those working with children exhibiting behavioural concerns. Overall, it is crucial to consider the potential role that schools can play in both creating and ameliorating children's emotional and behavioural difficulties. Given the potential benefits associated with physical activity during childhood, it is also of great importance to consider the particular needs of children with EBD in physical activity settings. Although some research has investigated the effects of physical activity on the social, emotional, and behavioural functioning of children with EBD (Armstrong, & Drabman, 1994; Basile, et al., 1995; Parish-Plass & Lufi, 1997), further research is warranted. In particular, future research should investigate the effects context variables (such as structure) on the experiences of children during physical activity. This research may be particularly valuable for educators and school personnel who work alongside children experiencing difficulties. Additionally, further research investigating the impact of unstructured break periods, such as recess, on the subsequent classroom behaviours of children with and without behavioural concerns would provide valuable insights into this issue. Moreover, such research could have important academic and developmental implications for children within the school context.

## The Present Study

### Purpose

Unlike the methods used in previous research investigating the impact of recess on students' classroom behaviour (Jarrett et al., 1998; Pellegrini, & Davis, 1993; Pellegrini et al., 1995; Rigway et al., 2003), this present study evaluated the effects of an intact school recess period on the subsequent classroom behaviours of children. This unstructured recess period took place in the school playground where the expectations and monitoring of children's behaviour were different than in the classroom setting. Moreover, behavioural comparisons of children were made within structured (i.e., Physical Education) and unstructured (i.e., recess) physical activity contexts.

### Research Questions and Hypotheses

Guiding this investigation were three primary research questions and hypotheses.

In particular:

- 1) What is the influence of an unstructured recess period on the subsequent classroom behaviours (i.e., adaptive and problem behaviours) of children?

**Hypothesis 1.** Based on previous research findings related to the developmental functions of recess for typically developing children (Jarrett et al., 1998; Pellegrini, & Davis, 1993; Pellegrini, et al., 1995), as well as for children with emotional and behavioural concerns (Jarrett et al., 1998; Rigway et al., 2003), it was expected that all children would display greater adaptive behaviours, and fewer problem behaviours, while observed in the classroom subsequent to an unstructured recess period.

- 2) How do the behaviours of children (i.e., adaptive skills, problem behaviours, and activity levels) in unstructured physical activity contexts compare to those displayed in structured physical activity contexts?

**Hypothesis 2.** Due to a limited amount of systematic research, the specific direction and pattern of expected results in relation to the effects of structured versus unstructured physical activity settings on children's behaviour remained unclear at the onset of this investigation. However, in line with Litner and Ostiguy's (2000) contention that some children (such as those with ADHD) may derive benefits from participation in leisure settings that incorporate a higher degree of structure and consistency, the data was explored to reveal whether more adaptive and fewer problem behaviours were observed among children within structured, as opposed to unstructured, physical activity contexts.

- 3) How do children's behaviours within structured and unstructured physical activity contexts (recess and Phys-Ed) compare to their classroom behaviours (i.e., adaptive skills, problem behaviours)?

**Hypothesis 3.** There is some literature suggesting that children's behaviours are less problematic within settings that provide more predictability, structure and closer monitoring versus settings that provide less organization and supervision (Lewis, Colvin, & Sugai, 2000; Litner and Ostiguy, 2000). As such, the data was analyzed to explore whether more adaptive and less problem behaviours occur within a more highly structured and closely monitored classroom and physical activity (i.e., Phys-Ed) environments, in comparison to unstructured physical activity settings (i.e., Recess).

Within the framework of this study, an exploratory research question was also investigated; that is:

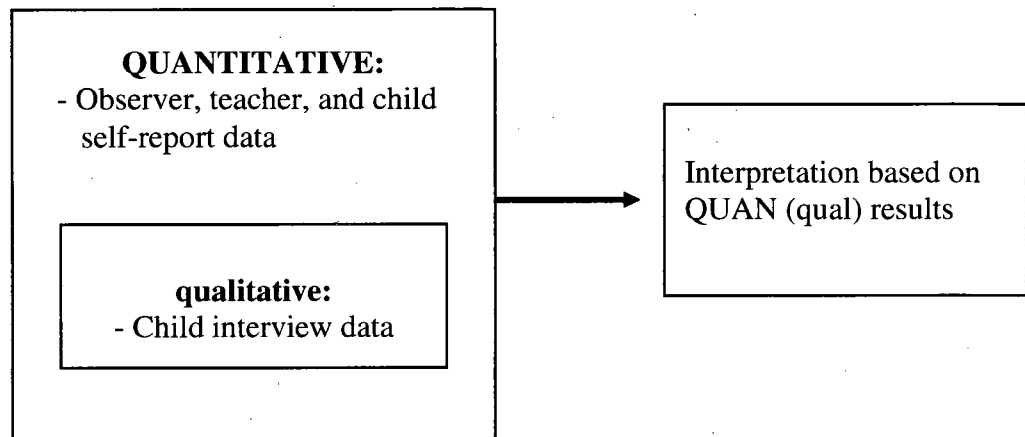
- 4) What is the relationship between teacher ratings, child self-report ratings, and independent observer ratings of children's classroom behaviours?

This question was posed to examine whether the observer ratings were consistent with teacher and/or child self-report ratings of behaviour, and lend further support to validity of our findings.

## **Methodology**

### **Research Design**

To explore the research questions and hypotheses previously outlined, an embedded quasi-experimental model (i.e., pre/post comparisons with no control group) mixed method design was used. This type of design is characterized by the simultaneous collection of both quantitative and qualitative data, with one form of data playing a primary role and the other playing a supportive secondary role (Creswell, 2008). Within the present study, qualitative data was embedded within a quantitative research design, in order to enhance the interpretation of quantitative results (see Figure 1). The quantitative outcome measures were collected through observations of children within the school context. In particular, frequency data about children's problem and adaptive behaviours before and after recess in the classroom, as well as during recess and Physical Education periods, were gathered by an observer. To help explain and support this data, qualitative information was also collected regarding children's perceptions of recess and Phys-Ed, as well as of their behaviour within such contexts. For descriptive purposes, teachers and children also provided quantitative information about children's display of problem and adaptive behaviours within the school context.



*Figure 1.* Research design.

### **Participants and Setting**

In total, 21 children ( $M = 10.14$  years), including eight males and 13 females, were recruited to take part in this study. More specifically, six children in Grade 3 (one male, five females,  $M = 8.5$  years) and fifteen children in Grade 6 (seven males, eight females,  $M = 11.53$  years) participated in this research. Two Grade 6 classroom teachers, one Grade 3 classroom teacher, and one Physical Education teacher were also involved in the project.

All participants were recruited from one elementary school in a suburb of Montreal, Quebec. The instructional program at this school was bilingual at all grade levels; that is, half of students' total instructional time was in English, and half of the time it was in French. More specifically, the subject areas taught in English included English Language Arts, Mathematics, Ethics and Religious Culture, and Music. French instruction was provided for French Language Arts, Social Studies, Science and Technology, Art, and Phys-Ed.



Throughout the 2009-2010 academic year (and at the time of data collection), there were over 300 students in Kindergarten through Grade 6 enrolled at the school. The student population represented a wide range of cultural and linguistic groups. As noted on the school website, the students and their families were from at least thirty different countries of origin, and more than twenty different first languages were spoken at home. As further documented by the school principal (within a recent 'School Success Plan'), approximately 70% of the student population were of backgrounds considered to be visible minorities. In particular, about 60% are from South-Asian cultural backgrounds, primarily, Sri Lankan, East Indian, and Pakistani descent.

In addition to cultural and linguistic diversity, the school context was characterized by the presence of children with a variety of specialized educational needs. These include students with social, emotional, behavioural, intellectual and physical difficulties. Although the exact number of at-risk and special needs students were not provided to the researcher, the school principal noted that "there is higher than average incidence of learning disabilities, behaviour problems and other special needs" (personal communication, July 5, 2010) among the student population.

Within the research sample, the specific characteristics and needs of each child also varied to some extent; however, their behaviours, on average, are considered typical of other children their age. More specifically, their behaviour scores on both BASC-2 (Reynolds, & Kamphaus, 2004) teacher- and child self-report measures fall within the typical range; that is, T Scores of less than 60 for problem behaviour categories, and greater than 40 for adaptive behaviour were obtained. More specifically, typical scores

are noted for teacher ratings of externalizing problems ( $M = 46.29$ ,  $SD = 5.76$ ), internalizing problems ( $M = 46.62$ ,  $SD = 8.59$ ), school problems ( $M = 47.57$ ,  $SD = 9.39$ ), behavioural symptoms ( $M = 46.29$ ,  $SD = 7.49$ ), and adaptive skills ( $M = 56.62$ ,  $SD = 9.57$ ). Child self-reports of behaviour also indicate average scores within the normal classification range for school problems ( $M = 51.24$ ,  $SD = 10.78$ ), internalizing problems ( $M = 55.71$ ,  $SD = 8.98$ ), inattention/hyperactivity ( $M = 51.10$ ,  $SD = 9.18$ ), emotional symptoms ( $M = 51.38$ ,  $SD = 8.38$ ), and personal adjustment ( $M = 52.0$ ,  $SD = 7.32$ ).

Overall, the school context in which this research was conducted was committed to an Inclusive Education Policy in which school personnel strived to meet the needs of all students within the regular classroom context. In an effort to create success for all, a variety of programs and support services have been implemented within the school context. These included, specialized assessment and consultation services, as well as peer mediation and peer tutoring, to name a few.

Many of these programs and services were carried out by the school's large resource team, including French and English resource teachers, integration aides, behaviour aides, learning specialists and diagnosticians, as well as psychologists. School personnel received additional support, and were provided opportunities for professional development, from a multi-disciplinary team known as the Family School Support Treatment Team (FSSTT) which is organized at the school board level. Broadly, the team provided therapeutic interventions to students and families experiencing social, emotional and/or behavioural difficulties. In particular, a full-time Social Aide Technician from the team worked alongside other members of the school's resource personnel. Additional

specialists were also available for any necessary consultations, assessments and recommendations including a CSLC Social Worker, occupational and speech/language therapists, and school psychologists.

**Description of school physical activity settings.** Given the research questions previously outlined, it may be useful to provide further details about the contexts in which children interacted during recess and Phys-Ed. As such, physical features of the school playground and gymnasium, as well as the types of activities observed in each context, will be discussed.

*School playground.* At the school in which this research was conducted, recess was offered for 15 minutes in the morning and afternoon, as well as for 20 to 30 minutes during the lunch hour. There were two separate playgrounds utilized by the students during this period. One was located behind the school, and the other was located directly in front of the school building. Children in Kindergarten, Grade 1, and Grade 4 had access to the back yard during recess; whereas children in Grades 2, 3, 5 and 6 used the front yard. As such, recess for all the students included in the sample (Grade 3 and 6) took place in front schoolyard.

The playground was relatively large, and was bordered by the school building (at the front), a sidewalk and suburban street (at the back), the school parking lot (to the left of the school), and a neighbouring school's fenced baseball diamond (to the right). The front school yard was not enclosed by any overt physical boundaries such as a metal fence or painted lines. Three doors of the school were used to enter or exit the playground. One was the main double-door entrance of the school. The other two doors

were located to the right and left of the main entrance on the façade school building. Children entered the schoolyard using whichever door was closest to their homeroom class. A portion of the schoolyard, directly in front of the school building, was a rectangular strip of paved concrete on which there were hopscotch squares and other painted white lines. Upon exiting the main doors of the school, on the close right hand side of the pavement, there were also six basketball nets arranged in pods of three. That is, three nets are arranged in a circular cluster around one main pole. In front of the paved concrete area, extending to the back of the schoolyard towards the street, there was also a large grassy area. On the left hand side of grass (adjacent to the parking lot), there were two large rubber tires half-buried underneath the earth. At the centre of the yard, there was a metal play structure which was border by a square-shaped sandy area. The play structure was brightly coloured with two blue slides, as well as three red and one yellow ladder. There were also two sets of monkey bars, and several platforms located at varying levels. Additionally, at the front right-hand side of the grassy section, there was a soccer field area with one net on either end. Just beyond this, at the back (far right) of the schoolyard, there was also a small baseball diamond with a sandy area located close to home base. Aside from the outdoor equipment already mentioned, other seasonally appropriate materials such as skipping ropes, skips-its, soccer balls, basketballs and footballs were sometimes provided by children's Physical Education or classroom teachers.

During lunch recess in the schoolyard, the supervision of children was carried out, primarily, by the school lunch monitors. These same adults were also responsible for

supervising children while they eat lunch in their respective classrooms. In other words, one monitor per classroom was responsible for the supervision of children during the entire lunch period. As noted on the school website, this level of supervision is somewhat higher than most schools within the suburban district in which it is located; however, given the large size and open boundaries of the schoolyard, this level of monitoring was also essential to ensure safety.

While outdoors during recess, children engaged in a variety of different activities. Often, children were observed socializing and interacting with their peers; that is, they often maintained close proximity to at least one other student, and were observed talking or gesturing. At times, this peer interaction took place while children remained sedentary (e.g., while standing motionless with five to six peers), but it was often observed in combination with participation in physical activities. For instance, children socialized while playing football in a large group, or navigating the play structure with two to three other students. During the recess period, some children choose to initiate and participate in activities which were more highly organized (i.e., having particular objectives or rules), including games of basketball, football, soccer, and tag. At other times, however, children engaged in more loosely organized activities such as sliding or building in the snow (during winter), walking around the yard, skipping, and running or chasing after peers.

***School gymnasium.*** In total, 150 minutes of Physical Education was provided to children in Grades 1 to 6 each week (whereas 90 minutes was provided to children in kindergarten). For all grade levels, Phys-Ed took place within the gymnasium; however,

if the weather was favourable, outdoor activities within the schoolyard were also sometimes organized. For this current project, data collection during Phys-Ed periods took place *only* within the school gym.

The gymnasium was located in the direct centre of the school building. It was a relatively large rectangular space (i.e., standard sized gymnasium), with black, white and yellow painted divisions on the floor. The walls were also painted with red, black and blue line divisions and target symbols. In total, six wooden benches lined two of the gym walls— three along the front, and three along the back. Further, there were three sets of double doors from which students and school personnel entered this context. These were located along the front, back, and one of the side walls of the gym. Along this side wall there were also two offices (for the Phys-Ed teachers), as well as two storage spaces. The storage areas contained a variety of materials including skipping ropes, hula hoops, scooters, hockey sticks, and pylons, as well as many multi-purpose balls and rackets. Adjacent to one of the offices, at the far side corner of the gymnasium, there was also a large stack of blue mats which are of varying shapes and sizes. Along the other side of the gymnasium, was a stage that was used for extra-curricular activities and school concerts. In front of the stage, there was an area which was often designated for playing hockey. As such, there were two hockey nets; one located near the front, and one near the back wall. In addition to this equipment, there were six basketball nets; one was located at the center of each side wall, and two are located on each of the front and back walls.

During Phys-Ed, the children were supervised and instructed by the Physical Education teacher. Other adults, including integration and behaviour aides, were also

frequently present within the gymnasium during Phys-Ed (similar to within a regular classroom). As well, on some occasions, two classes participated in Phys-Ed within the gymnasium at the same time. When this occurred, part-time and full-time Physical Education teachers were both present within the gym and each educator was responsible for the supervision and instruction of their respective groups.

Generally, the Physical Education program focused on fitness, sport skill training, and gymnastics, as well as health/nutrition education. Addressing each of these broad educational objectives, a variety of different activities were organized by the Physical Educator. In particular, a collection of different tag games, each emphasizing the acquisition of unique fitness skills, were coordinated. At times, such games also placed emphasis on cooperation and teamwork. During Hoop Tag, for example, any student who was tagged was expected to stand inside a hula hoop (placed on the floor) until they were retrieved by a 'safe' team member who brought them to a fitness station to perform five repetitions of a particular physical activity (e.g., side to side jumps, push-ups, etc.). Games involving the use of scooters were also coordinated. More specifically, children practiced passing softballs, blocking passes and scoring on a net, while manoeuvring around the room on scooters. More traditional team games such as basketball and floor hockey were also organized during Phys-Ed. Additionally, 'Fitness Stations' were set up so that small groups of children rotated their participation in a variety of activities (such as skipping, squatting, jumping side to side, and plank) after a certain intervals of time.

Overall, although one or two main activities were typically selected and coordinated by the teacher during each Phys-Ed period, the organization of Phys-Ed

every Friday was unique. On Fridays, children were provided with a greater degree of choice as to which activities they could engage in and with whom. On these days, a selection of at least four or five different types of equipment were made accessible to the children (e.g., medicine balls, scooters, skipping ropes, blue mats, hockey equipment, etc.) and they were permitted to engage in activities using any of these materials at any point throughout the Phys-Ed period.

### **Procedure**

**Ethical approval and recruitment.** Upon obtaining ethical approval to conduct this research from Concordia University's ethics review board in early March 2009 (see Appendix A for a copy of the approval letter), a Montreal school board was contacted. Subsequently, the approved Summary Protocol Form, along with a brief research proposal was sent to members of the school board's ethics committee so that ethical approval could be obtained at this level. Once notified of ethical approval by the school board (late April 2009), the school principal of a selected elementary school was contacted, provided with a brief description of the project, and asked if they were willing to allow the research to take place within the school context. Verbal consent from the school principal was received at the end of April 2009.

In cooperation with the school principal, the researcher arranged an appropriate time to meet with school personnel so that general information about the goals of the research project could be communicated. In late October of 2009, the proposed project was presented to teachers at a staff meeting, which took place in the school context immediately after school. Shortly thereafter, teachers were approached by the researcher



in the school context and provided with information letters and consent forms (see Appendix B and C for a sample teacher information letter and consent form). Caution was taken to ensure that teachers were approached at a time of convenience, for example, during recess, a spare period, the lunch hour, or after school. Upon receiving consent from teachers, information letters and consent forms were sent home with all the children in each classroom (see Appendices D and E for a sample parent information letter and consent form). These forms were distributed to the Grade 6 students by their teachers. The Grade 3 students, on the other hand, received information letters, consent forms and a brief overview of the project from the primary research investigator. Once written parental consent was received, the researcher obtained a copy of the school schedule. Appropriate days to visit the classrooms, and begin data collection, were then discussed with the homeroom teachers.

**Data collection.** The data collection for this project took place over a span of approximately five months, beginning in early November 2009 and continuing until early April 2010. See Table 1 for a visual timeline of the data collection procedure. During this time, the primary research investigator spent three or four days per week at the elementary school. Upon receiving parental and teacher consent, each child was observed in the school context under four different conditions: a) pre-recess in the classroom, b) outdoors during a lunchtime recess period, c) post-recess in the classroom, and d) during a regularly scheduled Physical Education class. For approximately a full year prior to commencing these observations (i.e., from early December 2008 to early November 2009), the researcher had been present within the school context as a volunteer. This

helped to ensure that the students became familiar with the presence of an additional adult (the researcher) within the classroom, as well as within recess and Physical Education contexts. This may have also helped to minimize any disruption caused by the presence of an outside observer within the school setting. Being present within the school prior to data collection also served to heighten the researcher's awareness of the practical issues 'at hand' within the school environment, and to a certain extent, allow for the observation protocols to be piloted.

In order to study the effects of an unstructured outdoor recess period on children's subsequent classroom behaviour, a momentary time sampling method of observation was used. Each time sampling observation (of a single child within one context) lasted approximately 15 minutes (Reynolds, & Kamphaus, 2004). One child was observed per day within the classroom context. All of the children in Grade 3 were observed in the same classroom (English homeroom), which comprised students in both Grades 2 and 3. The Grade 6 students, on the other hand, were observed in either their French or English homerooms. The Grade 6 students were from two separate classes (i.e., Room #3-French homeroom, and Room #4-English homeroom); however they shared the same teachers on alternating days of the week. That is, on the days when students from Room #3 were instructed by the English homeroom teacher, the students from Room #4 were instructed by the French teacher, and vice versa. This provided the researcher with greater flexibility when scheduling the observations.

In order to first establish a baseline level of behaviour, each child was observed in the classroom for 15 minutes immediately before the lunchtime bell (anytime between

11:50 am and 12:15 pm). Subsequently, each child's behaviour and overall activity level was observed for 15 minutes during a 30-minute outdoor recess period (between 12:40 pm and 1:10). Upon immediately returning to the classroom context (1:15 pm), each child was, once again, observed within the class for 15 minutes (between 1:15 pm and 1:40 pm).

Further, to compare the behaviour exhibited by children within unstructured (i.e., recess) and structured (i.e., Phys-Ed) physical activity contexts, all children were observed on a separate day during a regularly scheduled Physical Education class. Prior to data collection, the full-time Phys-Ed teacher was approached by the researcher in the school context, provided with general information about the project, and asked for permission to observe within their class. Within this context, a 15-minute time sampling observation was completed as soon as the activity period of the class began; that is, after the Phys-Ed teacher had provided children with any relevant instructions, or rules. At times, observations of more than one child were completed during a single Phys-Ed period depending upon the length of the class (i.e., whether the class was carried out over a 30 or 60-minute period), and the number of students present within the class who had returned a parent consent form to the researcher.

All children were observed under each of the four conditions (pre-recess, during recess, post-recess, and Phys-Ed) on one occasion. The appropriate scheduling of these observations within the school context required a fair amount of flexibility. For example, if any unanticipated events such as a last-minute school assembly, field trip, an indoor

lunch hour, or an extra-curricular activity occurred at the same time that an observation had been planned, it was necessary to reschedule.

To ensure the reliability of these observations, a volunteer research assistant, in addition to the primary research investigator, was trained to use the observation protocol. In total, 27% of all the observations were made by two observers. Since the sample was comprised of 21 children and four observations were made of each child, a total of 84 observations were made within the school context. Out of all these observations, 23 were completed by two observers. Moreover, the kappa statistic was calculated as an estimate of the level of inter-observer agreement beyond chance (Viera, & Garrett, 2005). Specifically, inter-observer reliability (kappa) coefficients were calculated for each time interval of the observation protocol (i.e., 15 intervals in total). For all categories of behaviour, the average kappa coefficient obtained was .95 (95%) with a range of scores between .89 and 1.0 (89%-100%) across all observation intervals. For adaptive categories of behaviour, the average kappa coefficient was .94 (94%), ranging from .84 to 1.0 (84%-100%). Similarly, the kappa coefficients for problem behaviour categories averaged .95 (95%) with a range of scores between .86 and 1.0 (86%-100%). Finally, the average kappa coefficient obtained for children's activity level (across all intervals) was .91 (91%) with scores ranging from .83 to .96 (83%-96%). Overall, these results indicate a high level of inter-observer agreement.

In early January 2010, teachers were also provided with a package that included one behavioural assessment (BASC-2 Teacher Rating Scale; Reynolds, & Kamphaus, 2004) corresponding to each student of the class who had parental consent to participate

in the study. Teachers were asked to complete a behavioural assessment of each child using a paper-pencil format, and to return the relevant forms to the researcher once completed. Both of the Grade 6 teachers agreed to complete the assessments; however, the Grade 3 teacher did not wish to complete the behavioural assessments for personal reasons. Despite this, the Grade 3 teacher agreed to collaborate with the researcher so that the other aspects of the data collection could be completed. Due to these circumstances, the behavioural assessments of the six Grade 3 students were completed by the Physical Education teacher. By late February 2010, all of the behaviour assessments had been returned to the researcher.

Moreover, once all four observations of a child had been completed, arrangements were made with the teacher so that an appropriate time to meet with the student individually, outside of the classroom, could be scheduled. Arrangements to meet with each child were made through communications with the classroom teachers either via e-mail or in person. Once an appropriate meeting time was established, the primary research investigator met with children in order to assist them with the completion of a self-report measure their behaviour (BASC-2 Self Report of Personality; Reynolds, & Kamphaus, 2004). Individual meetings took place in a quiet room within the school context, typically, the library or an empty classroom. At the onset of each meeting, children were provided with details about how the meeting would proceed, and oral consent was attained in order to ensure their willingness to participate (see Appendix H for a sample student oral consent form). Then, a short open-ended interview was completed with the children. The interview was designed to explore children's

perceptions of school physical activity periods (i.e., likes and dislikes), as well as of their behaviour in such contexts. Students' responses to the questions were recorded by the researcher on the observation protocol using a paper-pencil format. Afterwards, a behavioural assessment was completed using a researcher-directed interview format. The assessment was carried out in this fashion in order to encourage, or facilitate, children's participation in the project, especially those who may have trouble reading. Each individual meeting lasted approximately 30 minutes.

Table 1

*Timeline of Data Collection*

	<b>November 2009 – April 2010</b>	<b>January- February 2010</b>	<b>March- April 2010</b>
<b>Researcher</b>	♦ Observations of children: - pre-recess - during recess - post-recess - during Phys-Ed		
<b>Teacher</b>	♦ Behaviour assessments: Teacher Rating Scale		
<b>Child</b>	♦ Child interviews ♦ Behaviour assessments: Self-Report		

**Measures**

To explore the effects of structured and unstructured physical activity contexts on children's behaviour, information was gathered from multiple perspectives; that is, from the teacher, child, and an observer. As such, a number of different measures were

administered. The following section will provide details about the features of these assessments.

**Behavior Assessment System for Children, second edition.** The Behavior Assessment System for Children (BASC- 2; Reynolds, & Kamphaus, 2004) is a standardized, multidimensional assessment tool used to evaluate numerous positive and negative dimensions of behavior and personality during childhood and young adulthood (2 to 25 years). It is comprised of five separate components (or forms), which may be used either in some combination, or independently. Specifically, there two rating scales, one which is to be completed by teachers (Teacher Rating Scale) and one by parents (Parent Rating Scale). Each of these scales can be used to collect information about the children's observable behaviors. There is also a self-report scale (Self-Report of Personality), which can be used to gather information about a child or young adult's own emotions and self-perceptions of behavior. Additionally, the system includes a Structured Developmental History (SDH) form, which provides space for professionals to review any "social, psychological, developmental, educational and medical information about a child" (Reynolds, & Kamphaus, 2004, p. 45). Lastly, the BASC-2 includes an observation protocol form (Student Observation System) that can be employed for the purposes of directly recording and categorizing behaviors observed within the classroom. Individually, each of the BASC- 2 components have been shown to be psychometrically reliable and valid (Reynolds, & Kamphaus, 2004). Additionally, norms for the Teacher Rating Scale, Parent Rating Scale, and Self-Report of Personality are based on a large nationally representative US sample, and are categorized according to the age, sex and

clinical status of the child (Reynolds, & Kamphaus, 2004).

For the purpose of this project, only the Teacher Rating Scale (TRS), Self-report of Personality (SRP), and Student Observation System (SOS) were employed (See Appendices F and G for sample questions of the TRS and SRP, and Appendix I for sample categories of the SOS). As such, the remainder of this section will provide a more detailed overview of each of these measures.

**BASC-2: Teacher Rating Scale.** The TRS is a comprehensive assessment tool used to measure adaptive and maladaptive behaviours exhibited by students within the school context. There are three forms, which correspond to three distinct age groups; that is, preschool (ages 2 to 5 years), child (ages 6 to 11 years), and adolescent (ages 12 to 21 years) populations. For the purpose of this research, teachers completed either the child or adolescent form, depending upon the specific ages of the children that obtained parental consent to participate in the study. Both the child and adolescent forms are comprised of 139 items, each of which corresponds to a short descriptor of child behaviour. Respondents are to indicate how the child has behaved recently (or within the last several months) by rating each item on a 4-point scale, consisting of Never, Sometimes, Often, and Almost Always. Broadly, the child and adolescent forms of the TRS assess four domains of behaviour; namely, Adaptive Skills, Externalizing Problems, Internalizing Problems, and School Problems. In addition, it provides an overall composite, or assessment, of problem behaviours termed the Behavioural Symptoms Index (or BSI). High internal consistency estimates of the individual scales have been demonstrated at both the child and adolescent levels, with coefficients ranging from .85



to .89 (Reynolds, & Kamphaus, 2004). Moderate to high correlations have also been noted between the composites of the TRS, and the related scales of alternative behavioural assessments, including the *Achenbach System of Empirically- Based Assessment* (ASEBA; teacher form) and the *Conners' Teacher Rating Scale- Revised* (Reynolds, & Kamphaus, 2004). According to Reynolds and Kamphaus, (2004), the entire scale takes approximately 10 to 15 minutes to complete.

**BASC-2: Self-Report of Personality.** The SRP is a personality inventory which is used to collect information about respondents' self-perceived emotions and behaviour. There are three different versions of the measure, each corresponding to a different age level. Specifically, there are separate forms for children (aged 8 to 11 years), adolescents (aged 12 to 21 years), and young adults receiving post-secondary education (aged 18 to 25 years). Each version is written at a Grade 3 reading level (Reynolds, & Kamphaus, 2004). Only the child and adolescent versions of the SRP were in this study, depending upon the ages of the oldest participants at the time of data collection. The child version of the SRP consists of 139 items, and the adolescent form consists of 176 items, in total. There is, however, considerable overlap (in terms of structure and content) between the two forms (Reynolds, & Kamphaus, 2004). Both versions consist of a set of statements, which prompt respondents to answer in one of two ways. The first items presented provide respondents with two answer choices (True or False), while the remaining items provide respondents with four answer choices (ranging from Never to Almost Always). The child and adolescent forms also have identical composite scores; that is, School Problems, Internalizing Problems, Inattention/Hyperactivity, and Personal Adjustment, as

well as an overall composite score of behaviour termed the Emotional Symptoms Index (or ESI). High internal consistency reliability estimates have been noted for individual scales of the SRP, with the median coefficient near .80 (Reynolds, & Kamphaus, 2004). As well, moderate to high correlations have been found between the SRP scales, and conceptually similar scales of other self-report measures of behaviour, including the *ASEBA- Youth Self- Report Form*, and the *Conners-Wells Adolescent Self- Report Scale* (Reynolds, & Kamphaus, 2004). According to the BASC-2 creators, the SRP takes approximately 20 to 30 minutes to complete (Reynolds, & Kamphaus, 2004).

**BASC-2; Student Observation System (part B).** The SOS is a 15-minute observation procedure used to record direct observations of children within the classroom setting (Reynolds, & Kamphaus, 2004). In particular, Part B of the form assesses a broad spectrum of behaviour through momentary time sampling; that is, the systematic coding of behaviour during 3-second intervals, spaced 30 seconds apart (Reynolds, & Kamphaus, 2004). Four domains of the SOS have been included to evaluate children's level of adaptive functioning; specifically, their Response to Teacher/ Lesson, Peer Interaction, Work on School Subjects, and Transition Movement. Nine additional domains assess children's display of maladaptive behaviour; namely instances of Inappropriate Movement, Inattention, Inappropriate Vocalization, Somatization, Repetitive Motor Movements, Aggression, Self Injurious Behaviour, Inappropriate Sexual Behaviour, and Bowel/Bladder Problems (Reynolds, & Kamphaus, 2004; see Appendix J for definitions and behaviour examples of each category). Within this study, the paper-pencil format of the SOS form was used, and each interval was timed using a

digital stopwatch. To clarify the use of this measure, the child was observed for 3 seconds following a 30-second interval. Subsequently, any behaviors observed during the 3-second observation period were indicated on the record form by placing a check mark beside the relevant behavior categories. If several behaviors occurred, more than one behavior category was checked in a single time column. If none of the behaviors are observed, it was not necessary to include a check mark in every time column (Reynolds, & Kamphaus, 2004). The record form also includes a space for general comments or impressions of the student's behavior and interaction with others. Upon completing the 15-minute observation period, the check marks for each behavior category were summed, and entered into the *Total* column of the record form.

According to Reynolds and Kamphaus (2004), the SOS may be valuable as a complementary assessment tool to the TRS, and SRP measures. As such, the SOS was used to complete pre- and post- recess observations of children's behavior within the classroom context. It was also be used to observe children during their lunchtime recess period, and physical education class. However, several additional items adapted from Eaton and colleagues' (1987) *Scheme for Observing Activity Level* (SOAL) were also be included on the form, in order to assess children's type and level of activity within physical activity settings.

**Scheme for Observing Activity Level.** The SOAL is a coding scheme consisting of a 9- point ordinal scale. The scale is based on a 3 by 3 matrix, with three sections corresponding to the child's physical position or posture (i.e., Lying, Sitting, and Standing), and each section scored on a 3-point scale indicating the level of intensity

associated with the activity (i.e., low, medium, and high). Specifically, a score of 1 to 3 may be given for 'lying down', 4 to 6 for 'sitting', and 7 to 9 for 'standing'. To clarify, a score of 1 indicates that a child is lying down and exhibiting little movement (for e.g., lying motionless, or remaining stationary while on hands and knees), while a score of 9 indicates that a child is standing and engaging in a high degree of movement (for e.g., running across the schoolyard, or rope climbing; see Appendix K for all category definitions). The SOAL has been studied at length by Eaton and colleagues (1987). Such research has demonstrated impressive inter-rater reliability of the SOAL scores, with correlations ranging from 0.90 to 0.94 (Eaton et al., 1987). Overall SOAL scores have also been found to be significantly correlated with alternative measures of activity level, including a mechanical device for recording activity (i.e., an actometer), suggesting an adequate degree of convergent validity (Eaton et al., 1987).

Previous research has used this observation scheme to measure type and intensity of activity exhibited by children during an outdoor recess period (for e.g., Pellegrini et al., 1995). The scale was used in a similar fashion within this current study; specifically, during recess and Phys-Ed. Three items, 'lying', 'sitting' and 'standing', were written in each of the blank spaces provided at the bottom of the BASC-2 Student Observation System form. The inclusion of such items on the SOS record form saved space, and avoided using additional paper while completing observations of children within physical activity contexts. To indicate the intensity of the child's activity for each posture, the corresponding scores (between 1 and 3, 4 and 6, 7 and 9) were indicated by the observer within the appropriate time column.

**Child interview.** This assessment was adapted from Petrakos' (2009) 'Do you like School?' interview (see Appendix L for the adapted interview protocol). In total, it consisted of seven questions, five of which were open-ended. More specifically, six of the items were included to gain a sense of children's perceived likes and dislikes about recess and Phys-Ed. One additional item was included to gain an understanding of children's perceptions of their behaviour and social interactions during recess compared to Phys-Ed periods.

## Quantitative Results

### Quantitative Data Analysis

The first step towards data analyses involved scoring the data collected. For the SOS measure, frequency scores were tallied for each behaviour category. Additionally, composite scores for adaptive behaviour and problem behaviour were computed by summing up the frequencies of each of the corresponding behaviour categories. For the SOAL items (included on the SOS form), an average score of activity level was calculated for each physical posture. Specifically, averages between 1 and 3 for lying, 4 and 6 for sitting, and 7 and 9 for standing were calculated. A total sum of activity was also calculated for each participant by adding up the average intensity levels obtained at each posture. The lowest possible score was 1, which would have been afforded, for example, if the participant laid motionless the entire observation period. The highest possible score was 18, if for example, the participant engaged in high intensity activity (on average) at each posture (i.e.,  $3 + 6 + 9$ ). A higher number, therefore, indicates greater energy expenditure. Further, results of the TRS and SRP measures were scored using computer software known as BASC-2 ASSIST™. Once teacher and child responses were entered, the program created profiles for each child identifying teacher perceptions and child self-perceptions of strengths and weaknesses. More specifically, composite scores (such as those indicated within the methodology section) were calculated and reported for each child.

All quantitative data was then inputted and analyzed using a computer software program known as *Statistical Package for Social Sciences* (SPSS; version 16.0.2 ©

2007). Descriptive statistics were calculated in order to compile and organize the data regarding children's frequency of adaptive and problem behaviours within each observational context. Additionally, paired samples t-tests were performed on the data so that behavioural comparisons of children could be made across school contexts. In particular, these analyses were used to compare adaptive and problem behaviour: a) pre-recess (baseline) and post-recess in the classroom; b) during recess and Phys-Ed, as well as c) during classroom periods (pre and post recess) and school physical activity periods (recess and Phys-Ed). Finally, Pearson product moment correlation analyses were conducted to determine whether relationships exist between observer ratings, child ratings and teacher ratings of problem and adaptive behaviour.

### **Descriptive Results**

Prior to addressing the main research questions, descriptive statistics were computed in order to provide a more complete picture of the types of behaviours observed across each school context. Means, standard deviations, minimums and maximums for each category of behaviour are displayed in Tables 2 through 7. Moreover, the frequency of each type of adaptive and problem behaviour as a percentage of total behaviour is represented in Figures 2 through 5.

**Pre-recess classroom behaviour.** Both Table 2 and Figure 2 present descriptive findings for each category of adaptive and problem behaviour observed pre-recess in the classroom. Broadly, the results indicate that children, on average, displayed more adaptive skills ( $M = 13.95$ ) than problem behaviour ( $M = 6.81$ ) before the recess period.

The most frequent form of adaptive behaviour observed during this classroom period was children's demonstration of a response to the teacher or lesson ( $M = 6.24$ ), followed by children's work on school subjects ( $M = 4.57$ ). As a percentage of total behaviour, children's response to the teacher or lesson comprised 29%, and their work on school subjects represented 22% (see Figure 2). Out of all the problem behaviour categories observed in the classroom setting, inattention was most commonly observed ( $M = 2.19$ ), representing 11% of all behaviours.

In contrast, the least commonly observed behaviour observed in the classroom prior to recess was somatization ( $M = 0.33$ ), which comprised only 2% of all the observed behaviours pre-recess in the classroom. Also, as both Table 2 and Figure 2 demonstrate, no instances of more extreme forms of problem behaviour, including aggression, self-injurious behaviour, inappropriate sexual behaviour, and bowel or bladder problems were observed pre-recess in the classroom (0% of total behaviour,  $M = 0$ ).



Table 2

*Children's Classroom Behaviour: Pre-Recess*

Behaviour Category	<i>M</i>	<i>SD</i>	Min	Max
Response to Teacher/Lesson	6.24	3.79	0	13
Peer Interaction	2.05	2.13	0	6
Work on School Subjects	4.57	3.49	0	12
Transition Movement	1.10	1.51	0	6
Total Adaptive Behaviour	13.95	3.60	7	22
Inappropriate Movement	1.38	1.99	0	8
Inattention	2.19	2.11	0	9
Inappropriate Vocalization	1.00	2.12	0	9
Somatization	0.33	0.66	0	2
Repetitive Motor Movements	1.90	2.07	0	7
Aggression	0	0	0	0
Self-Injurious Behaviour	0	0	0	0
Inappropriate Sexual Behaviour	0	0	0	0
Bowel/Bladder Problems	0	0	0	0
Total Problem Behaviour	6.81	5.15	0	24

- |  |  |
|--|--|
| <input type="checkbox"/> Response to Teacher/Lesson    | <input type="checkbox"/> Peer Interaction                    |
| <input type="checkbox"/> Work on School Subjects       | <input type="checkbox"/> Transition Movement                 |
| <input type="checkbox"/> Inappropriate Movement        | <input type="checkbox"/> Inattention                         |
| <input type="checkbox"/> Inappropriate Vocalization    | <input type="checkbox"/> Somatization                        |
| <input type="checkbox"/> Repetitive Motor Movements    | <input type="checkbox"/> Aggression (0%)                     |
| <input type="checkbox"/> Self-Injurious Behaviour (0%) | <input type="checkbox"/> Inappropriate Sexual Behaviour (0%) |
| <input type="checkbox"/> Bowel/Bladder Problems (0%)   |  |

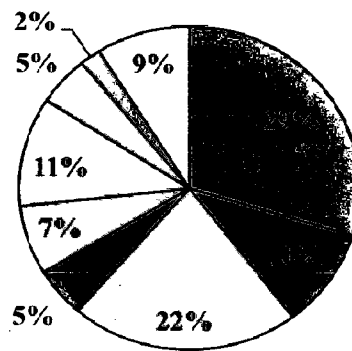


Figure 2. Pre-recess adaptive and problem behaviour categories as a percentage of total behaviour.

**Recess behaviour and activity level.** Table 3 and Figure 3 display the descriptive findings for children's adaptive and problem behaviour during the recess period. On average, more adaptive behaviours ( $M = 16.62$ ) than problem behaviours ( $M = 1.4$ ) were observed in the schoolyard during recess. In fact, very few problem behaviours were noted within this context. As a percentage, adaptive behaviour represented 92% of all the behaviours observed during recess, whereas problem behaviour represented only 8% (see Figure 3).

Positive peer interaction ( $M = 10.67$ ) was most often observed during recess, and comprised 58% of all behaviours. This was followed by transition movement ( $M = 2.81$ ),

which comprised 16% of total behaviour. The most common forms of problem behaviour observed within this context were somatization ( $M = 0.57$ ), and inappropriate movement ( $M = 0.52$ ); however each behaviour category represented only 3% of total behaviour.

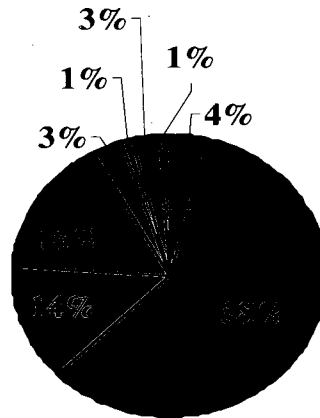
The least frequently observed behaviours during recess were all problem behaviours, including inappropriate vocalization ( $M = 0.10$ ) and aggression ( $M = 0.24$ ). As well, several of the problem behaviour categories were not observed at all during the recess period; for example, inattention, repetitive motor movements, self-injurious behaviour, inappropriate sexual behaviour, bowel/bladder problems each comprise 0% of total behaviour (all means = 0).

Table 3

*Children's Behaviour during Recess*

Behaviour Category	<i>M</i>	<i>SD</i>	Min	Max
Response to Teacher/Lesson	0.67	2.06	0	9
Peer Interaction	10.67	3.37	5	15
Work on School Subjects (independent activity)	2.52	3.01	0	10
Transition Movement	2.81	2.71	0	9
Total Adaptive Behaviour	16.62	3.38	11	24
Inappropriate Movement	0.52	1.21	0	5
Inattention	0	0	0	0
Inappropriate Vocalization	0.10	0.30	0	1
Somatization	0.57	2.04	0	9
Repetitive Motor Movements	0	0	0	0
Aggression	0.24	0.77	0	3
Self-Injurious Behaviour	0	0	0	0
Inappropriate Sexual Behaviour	0	0	0	0
Bowel/Bladder Problems	0	0	0	0
Total Problem Behaviour	1.4	2.44	0	9

- Response to Teacher/Lesson
- Work on School Subjects
- Inappropriate Movement
- Inappropriate Vocalization
- ▣ Repetitive Motor Movements (0%)
- Self-Injurious Behaviour (0%)
- Bowel/Bladder Problems (0%)
- Peer Interaction
- Transition Movement
- Inattention (0%)
- Somatization
- Aggression
- Inappropriate Sexual Behaviour (0%)



*Figure 3.* Recess adaptive and problem behaviour categories as a percentage of total behaviour.

In addition to children's behaviour, Table 4 presents descriptive results for children's activity levels during recess. As shown in Table 4, all participants ( $N = 21$ ) engaged in some physical activity while standing (i.e., running, walking, jumping etc.) throughout the recess observation period. Moreover, children's activity levels while standing were, on average, of low to moderate intensity ( $M = 7.6$ ). Fewer students engaged in activities while seated ( $N = 14$ ) or lying ( $N = 4$ ). When seated, children (on average) engaged in low to moderate intensity activities ( $M = 4.41$ ). Similarly, children's

activity levels, when in the lying position, were of moderate intensity ( $M = 2.0$ ). Overall, participants' total intensity of activity during recess, on average, can be considered within the moderate range ( $M = 10.92$ ).

Table 4

*Children's Activity Level during Recess*

Posture/ Activity Level	<i>M</i>	<i>SD</i>	Min	Max	N
Lying [1-3]	2.00	0.82	1	3	4
Sitting [4-6]	4.41	0.44	4	5	14
Standing [7-9]	7.60	0.32	7.1	8.2	21
Total Sum of Activity	10.92	2.58	7.1	15.7	21

*Note.* 1, 4, 7 = low intensity; 2, 5, 8 = moderate intensity; 3, 6, 9 = high intensity.

**Post-recess classroom behaviour.** The descriptive findings for children's adaptive and problem behaviour post-recess in the classroom are provided in Table 5 and Figure 4. The mean scores indicate that children displayed more adaptive behaviour ( $M = 13.38$ ) compared to problem behaviour ( $M = 5.62$ ) subsequent to the outdoor recess period.

More specifically, children, on average, displayed a response to the teacher or lesson ( $M = 7.24$ ), and work on school subjects ( $M = 2.86$ ) most often. As Figure 4 depicts, children's responses to the teacher or lesson accounted for 39% of all the behaviour observed in this context, while work on school subjects accounted for 15%. On average, the most frequently observed problem behaviour post-recess, on the other hand, was inattention ( $M = 2.14$ ), which comprised 11% of total behaviour.

In contrast, instances of somatization ( $M = 0.24$ ) and inappropriate vocalization ( $M = 0.86$ ) occurred least often, accounting for only 1% and 4 % of all the behaviours recorded during this observation period. Similar to pre-recess classroom observations, extreme problem behaviours including aggression, self-injurious behaviour, inappropriate sexual behaviour, and bowel/bladder problems did not occur following the recess period (0% of total behaviour, all means = 0).

Table 5

*Children's Classroom Behaviour: Post-Recess*

Behaviour Category	<i>M</i>	<i>SD</i>	Min	Max
Response to Teacher/Lesson	7.24	4.31	0	14
Peer Interaction	1.17	2.43	0	9
Work on School Subjects	2.86	3.28	0	11
Transition Movement	1.57	1.33	0	5
Total Adaptive Behaviour	13.38	3.54	7	22
Inappropriate Movement	1.33	2.03	0	6
Inattention	2.14	1.65	0	7
Inappropriate Vocalization	0.86	1.49	0	4
Somatization	0.24	0.63	0	2
Repetitive Motor Movements	1.19	1.66	0	6
Aggression	0	0	0	0
Self-Injurious Behaviour	0	0	0	0
Inappropriate Sexual Behaviour	0	0	0	0
Bowel/Bladder Problems	0	0	0	0
Total Problem Behaviour	5.62	3.58	0	13

- Response to Teacher/Lesson
- Work on School Subjects
- Innappropriate Movement
- Innappropriate Vocalization
- Repetitive Motor Movements
- Self-Injurious Behaviour (0%)
- Bowel/Bladder Problems (0%)
- Peer Interaction
- Transition Movement
- Inattention
- Somatization
- Aggression (0%)
- Inappropriate Sexual Behaviour (0%)

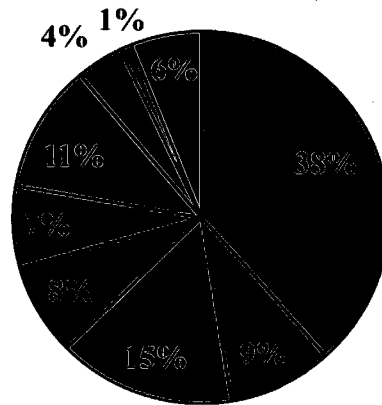


Figure 4. Post-recess adaptive and problem behaviour categories as a percentage of total behaviour.

**Phys-Ed behaviour and activity level.** Finally, the results describing children’s behaviours during a Physical Education class are presented in Table 6 and Figure 5. During the Phys-Ed observation period, children exhibited 17.86 adaptive behaviours, on average. In comparison, a mean of only 1.38 problem behaviours was noted. In total, adaptive behaviours comprised 93% of total behaviour, whereas problem behaviours comprised only 7%.

The most common form of adaptive behaviour observed during the Phys-Ed period was independent work on an assigned activity, or ‘work on school subjects’ ( $M = 7.86$ ), followed by peer interaction ( $M = 5.24$ ). Represented as a percent of total



behaviour, work on school subjects accounted for 41%, and peer interaction for 27%.

Although only a few problem behaviours were noted, the most common form observed during Phys-Ed was inattention ( $M = 0.76$ ), which comprised 4% of total behaviour.

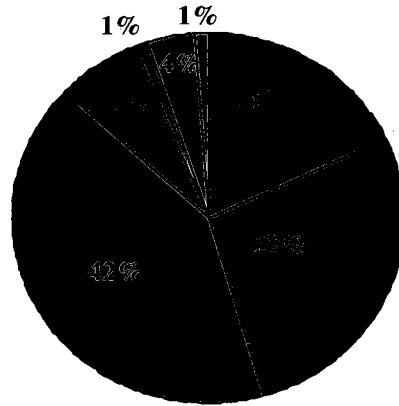
The least common forms of behaviour observed during the Phys-Ed period was aggression ( $M = 0.05$ ) and inappropriate vocalization ( $M = 0.10$ ), each accounting for less than 1% of all behaviour. Moreover, no occurrences of somatization, self-injurious behaviour, inappropriate sexual behaviour, and bowel bladder problems were witnessed during the Phys-Ed observation period (0% of total behaviour, all means = 0).

Table 6

*Children's Behaviour during Phys-Ed*

Behaviour Category	<i>M</i>	<i>SD</i>	Min	Max
Response to Teacher/Lesson	3.38	3.01	0	12
Peer Interaction	5.24	3.38	0	14
Work on School Subjects	7.86	3.47	0	14
Transition Movement	1.38	1.20	0	4
Total Adaptive Behaviour	17.86	2.61	13	23
Inappropriate Movement	0.19	0.40	0	1
Inattention	0.76	0.89	0	3
Inappropriate Vocalization	0.10	0.44	0	2
Somatization	0	0	0	0
Repetitive Motor Movements	0.29	0.64	0	2
Aggression	0.05	0.22	0	1
Self-Injurious Behaviour	0	0	0	0
Inappropriate Sexual Behaviour	0	0	0	0
Bowel/Bladder Problems	0	0	0	0
Total Problem Behaviour	1.38	1.53	0	4

- |   |                                       |
|---|---------------------------------------|
| ■ Response to Teacher/Lesson            | ■ Peer Interaction                    |
| ■ Work on School Subjects (independent) | ■ Transition Movement                 |
| ■ Inappropriate Movement                | ■ Inattention                         |
| ■ Inappropriate Vocalization (0%)       | ■ Somatization (0.5%)                 |
| ■ Repetitive Motor Movements            | ■ Aggression (0.5%)                   |
| ■ Self-Injurious Behaviour (0%)         | ■ Inappropriate Sexual Behaviour (0%) |
| ■ Bowel/Bladder Problems (0%)           |                                       |



*Figure 5.* Phys-Ed adaptive and problem behaviour categories as a percentage of total behaviour.

Further, Table 7 presents the descriptive findings for children's activity levels during the Phys-Ed observation period. While participating in Phys-Ed, 18 children engaged in some form of physical activity while standing, 17 while seated, and 5 while lying. On average, the intensity of activity that children exerted while standing was fairly moderate ( $M = 7.79$ ). The average intensity of activities performed by children while

seated ( $M = 4.44$ ) and lying ( $M = 1.6$ ), however, was within the low to moderate range. Overall, the mean of children's total activity levels was 10.65, indicating a moderate intensity.

Table 7

*Children's Activity Level during Phys-Ed*

Posture/ Activity Level	<i>M</i>	<i>SD</i>	Min	Max	N
Lying [1-3]	1.6	0.89	1	3	5
Sitting [4-6]	4.44	0.49	4	6	17
Standing [7-9]	7.79	0.44	7	8.5	18
Total Sum of Activity	10.65	3.05	4.70	15.55	21

*Note.* 1, 4, 7 = low intensity; 2, 5, 8 = moderate intensity; 3, 6, 9 = high intensity.

### **Independent Samples T-tests: Grade, Gender and Behaviour**

In addition to the descriptive findings of observed behaviour across each school context, a series of independent samples t-tests were performed on the data for exploratory purposes. More specifically, these analyses were carried out to compare the behavioural outcomes of groups of participants who differed in terms of their grade (i.e., Grade 6 and Grade 3), sex (i.e., male and female), as well as self- and teacher-reported behaviours (i.e., typical and at-risk).

First, independent samples t-tests were conducted to compare the behaviours and activity levels of children in Grade 3 ( $n = 6$ ) and Grade 6 ( $n = 15$ ) across school contexts (i.e., pre- and post-recess in the classroom, as well as during recess and Phys-Ed). The results indicate a significant difference between the composite activity level scores of children in Grade 3 ( $M = 12.88$ ,  $SD = 1.51$ ) and Grade 6 ( $M = 9.76$ ,  $SD = 3.078$ ) during

Physical Education;  $t(19) = -2.348, p = 0.030$ . There is also a significant difference between the activity levels of children in Grade 3 ( $M = 13.43, SD = 1.67$ ) and Grade 6 ( $M = 9.91, SD = 2.18$ ) during recess;  $t(19) = -3.541, p = 0.002$ . These results suggest that children in Grade 3 engaged in more intense physical activities compared to children in Grade 6 during both recess and Phys-Ed.

Next, independent samples t-tests were performed in order to make behavioural comparisons of male ( $n = 8$ ) and female ( $n = 13$ ) children. These analyses demonstrate no significant differences between male and female students' display of adaptive or problem behaviours, and overall activity levels, across each observational context.

Finally, independent samples t-tests were conducted to compare the behavioural outcomes of children classified as either typical ( $n = 12$ ) or at-risk ( $n = 9$ ) on the basis of teacher and self-reported ratings of behavioural strengths and weaknesses (BASC-2; Reynolds, & Kamphaus, 2004). According to the BASC-2 (2004) manual, children scoring above 60 on any problem behaviour subscale, or below 40 on any adaptive behaviour subscale, on either the self-report (SRP) or teacher-report (TRS) behavioural measures can be classified as at-risk for behaviour problems. As such, for grouping purposes, any child who obtained high T Scores on problem behaviour composites ( $> 60$ ), or low scores on adaptive behaviour composites ( $< 40$ ) on the self- or teacher-report behavioural assessments was categorized as at-risk, whereas those who did not were classified as typical.

Overall, there was a significant difference in the scores of post-recess adaptive behaviour for children classified as typical ( $M = 14.92, SD = 3.029$ ), and those classified

as at-risk ( $M = 11.33$ ,  $SD = 3.24$ ) for behaviour problems;  $t(19) = 2.605$ ,  $p = 0.017$ . Additionally, there was a significant difference in the scores of Phys-Ed adaptive behaviour for children considered typical ( $M = 19.08$ ,  $SD = 2.466$ ) and at-risk ( $M = 16.22$ ,  $SD = 1.856$ );  $t(19) = 2.91$ ,  $p = 0.009$ . These findings suggest that children falling within, or beyond, the at-risk range on any of the BASC-2 teacher-report (TRS) or child self-report (SRP) composite scores displayed *fewer* adaptive behaviours post-recess in the classroom, as well as during Phys-Ed. Nevertheless, the means of both groups on the adaptive scale were both within the typical range of functioning. The only difference was that the typical group were described as having more adaptive skills. In addition, since these analyses reveal no significant differences between typical and at-risk children's scores on problem behaviour across each observation context, all subsequent quantitative analyses were performed on the sample as a whole, without dividing participants into comparison groups.

### **Paired Samples T-tests: Behavioural Comparisons across Contexts**

To answer the primary research questions (and test any corresponding hypotheses) driving this investigation, a series of paired samples t-tests were performed on the data. The following section will recall the research questions and hypotheses outlined at the onset of this report, and present the results obtained in relation to each question.

**Research question 1.** What are the effects of an unstructured recess period on the subsequent classroom behaviours (i.e., adaptive and problem behaviours) of children?

**Hypothesis 1.** Based on previous research findings related to the developmental functions of recess for typically developing children (Pellegrini, & Davis, 1993;

Pellegrini, et al., 1995), as well as for children with emotional and behavioural concerns (e.g., Rigway et al., 2003), it was expected that all children would display greater adaptive behaviours, and fewer problem behaviours, while observed in the classroom subsequent to an unstructured recess period.

To address the first research question and hypothesis, statistical comparisons were made of children's behaviour before and after recess in the classroom. More specifically, a paired samples t-test was conducted to compare the frequency of adaptive behaviours (DV 1) displayed by children during pre-recess (IV condition 1) and post-recess (IV condition 2) classroom periods. A second paired samples t-test was performed to compare the frequency of problem behaviour (DV 2) exhibited by children pre-recess (IV condition 1) and post-recess (IV condition 2) in the classroom. As demonstrated in Table 8, there was no significant difference between the mean scores of adaptive behaviour obtained during pre-recess ( $M = 13.95$ ,  $SD = 3.60$ ) and post-recess ( $M = 13.38$ ,  $SD = 3.54$ ) classroom conditions  $t(20) = 0.54$ ,  $p > .05$ . Similarly, there was no significant difference between the mean scores of problem behaviour displayed before ( $M = 6.81$ ,  $SD = 5.15$ ) and after recess ( $M = 5.76$ ,  $SD = 3.66$ )  $t(20) = 1.04$ ,  $p > .05$ .

Table 8

*Pre- and Post- Recess Comparisons of Children's Problem and Adaptive Behaviour*

	<u>Context</u>		<i>t</i>	<i>df</i>
	Pre-recess	Post-recess		
Adaptive Behaviour	13.95 (3.60)	13.38 (3.54)	0.54	20
Problem Behaviour	6.81 (5.15)	5.76 (3.66)	1.04	20

*Note.* Standard deviations appear in parentheses below means.

**Research question 2.** How do the behaviours of children (i.e., adaptive skills, problem behaviours, and activity levels) in unstructured physical activity contexts compare to those displayed in structured physical activity contexts?

**Hypothesis 2.** Due to a limited amount of systematic research, the specific direction and pattern of expected results in relation to the effects of structured versus unstructured physical activity settings on children's behaviour remained unclear at the onset of this investigation. However, in line with Litner and Ostiguy's (2000) contention that some children (such as those with ADHD) may derive benefits from participation in leisure settings that incorporate a higher degree of structure and consistency, the data is explored to reveal whether more adaptive and fewer problem behaviours are observed within structured, as opposed to unstructured, physical activity contexts.

In order to investigate this second research question, statistical comparisons were made of children's behaviour within recess and Phys-Ed contexts. In particular, a paired samples t-test was carried out in order to identify any similarities or differences among



children's scores of adaptive behaviour (DV1) during recess (IV condition 1) compared to Phys-Ed (IV condition 2). An additional t-test was also conducted to compare children's scores of problem behaviour (DV 2) during recess (IV condition 1) and Phys-Ed periods (IV condition 2). As Table 9 illustrates, there were no significant differences between scores of children's adaptive behaviour during recess ( $M = 16.62$ ,  $SD = 3.38$ ) and Phys-Ed ( $M = 17.86$ ,  $SD = 2.61$ )  $t(20) = -1.37$ ,  $p > .05$ . The results also revealed no significant differences between scores of problem behaviour across physical activity settings (recess:  $M = 1.43$ ,  $SD = 2.44$  and Phys-Ed:  $M = 1.38$ ,  $SD = 1.53$ )  $t(20) = 0.09$ ,  $p > .05$ .

A paired samples t-test was also performed in order to compare children's overall activity levels (DV3) across recess (IV condition 1) and Phys-Ed contexts (IV condition 2). The results indicate no statistically significant differences between children's composite activity scores during recess ( $M = 10.92$ ,  $SD = 2.58$ ), compared to Phys-Ed ( $M = 10.65$ ,  $SD = 3.05$ )  $t(20) = -0.343$ ,  $p = 0.735$ .

Table 9

*Comparisons of Children's Problem and Adaptive Behaviour during Recess and Phys-Ed*

	<u>Context</u>		<i>t</i>	<i>df</i>
	Recess	Phys-Ed		
Adaptive Behaviour	16.62 (3.38)	17.86 (2.61)	-1.37	20
Problem Behaviour	1.43 (2.44)	1.38 (1.53)	0.09	20

*Note.* Standard deviations appear in parentheses below means.

**Research Question 3.** How do children's behaviours within physical activity contexts (recess and Phys-Ed) compare to their classroom behaviours (i.e., adaptive skills, problem behaviours)?

To investigate the third research question, statistical comparisons were made of children's behaviour during physical activity periods and classroom periods. As presented in Tables 10 through 13, a total of eight paired samples t-tests were conducted in order to compare children's adaptive (DV 1) and problem behaviour (DV 2) across each of the classroom (pre-recess and post-recess) and physical activity (recess and Phys-Ed) conditions.

Table 10 displays the results obtained for t-test comparisons of children's adaptive and problem behaviour pre-recess in the classroom and during the recess period. The results indicate a significant difference between children's scores of adaptive behaviour, and scores of problem behaviour, pre-recess in the classroom compared to during recess. That is, significantly fewer adaptive behaviours were observed before recess in the classroom ( $M = 13.95$ ,  $SD = 3.60$ ), than during the recess period ( $M = 16.62$ ,  $SD = 3.38$ )  $t(20) = -2.34$   $p < .05$ . Moreover, a significantly greater frequency of problem behaviours were observed pre-recess in the classroom ( $M = 6.81$ ,  $SD = 5.15$ ), compared to during the recess break ( $M = 1.43$ ,  $SD = 2.44$ )  $t(20) = 4.36$   $p < .001$ . Therefore, children's behaviours during recess seemed to be more adaptive and less problematic than during the classroom period prior to recess.

Table 10

*Comparisons of Children's Problem and Adaptive Behaviour Pre-Recess in the Classroom, and during the Recess Period*

	<u>Context</u>		<i>t</i>	<i>df</i>
	Classroom (Pre-recess)	Recess		
Adaptive Behaviour	13.95 (3.60)	16.62 (3.38)	-2.34*	20
Problem Behaviour	6.81 (5.15)	1.43 (2.44)	4.36**	20

*Note.* \* =  $p < .05$ , \*\* =  $p < .001$ . Standard deviations appear in parentheses below means.

Paired samples t-tests were also performed to compare children's behaviour pre-recess in the classroom and during Physical Education. As presented in Table 11, significantly fewer adaptive behaviours were observed before recess in the classroom ( $M = 13.95$ ,  $SD = 3.60$ ) compared to during Phys-Ed ( $M = 17.86$ ,  $SD = 2.61$ )  $t(20) = -4.21$ ,  $p < .001$ . Moreover, the frequency of problem behaviours pre-recess in the classroom ( $M = 6.81$ ,  $SD = 5.15$ ) was significantly greater than during Phys-Ed ( $M = 1.38$ ,  $SD = 1.53$ )  $t(20) = 4.60$ ,  $p < .001$ . The results suggest that more adaptive and fewer problematic behaviours were displayed during Phys-Ed than in the classroom period prior to recess.

Table 11

*Comparisons of Children's Problem and Adaptive Behaviour Pre-Recess in the Classroom, and during Phys-Ed*

	Context		<i>t</i>	<i>df</i>
	Classroom (Pre-recess)	Phys-Ed		
Adaptive Behaviour	13.95 (3.60)	17.86 (2.61)	-4.21**	20
Problem Behaviour	6.81 (5.15)	1.38 (1.53)	4.60**	20

*Note.* \*\* =  $p < .001$ . Standard deviations appear in parentheses below means.

Further statistical analyses were performed to compare children's behaviours post-recess in the classroom and during physical activity periods (i.e., recess and Phys-Ed). Table 12 presents comparisons of children's adaptive and problem behaviour post-recess in the classroom and during the recess period. Paired samples t-tests reveal a significant difference between the mean scores of both adaptive behaviour, and problem behaviour, post-recess in the classroom and during recess. More specifically, there were significantly fewer adaptive behaviours observed in the classroom subsequent to recess ( $M = 13.38$ ,  $SD = 3.54$ ), than during recess ( $M = 16.62$ ,  $SD = 3.38$ )  $t(20) = -2.91$ ,  $p < .001$ . In addition, more problem behaviours were observed post-recess ( $M = 5.76$ ,  $SD = 3.66$ ), compared to during the recess period ( $M = 1.43$ ,  $SD = 2.44$ )  $t(20) = 4.39$ ,  $p < .001$ .

Table 12

*Comparisons of Children's Problem and Adaptive Behaviour Post-Recess in the Classroom, and during the Recess Period*

	Context		<i>t</i>	<i>df</i>
	Classroom (Post-recess)	Recess		
Adaptive Behaviour	13.38 (3.54)	16.62 (3.38)	-2.91**	20
Problem Behaviour	5.76 (3.66)	1.43 (2.44)	4.39**	20

*Note.* \*\* =  $p < .001$ . Standard deviations appear in parentheses below means.

Finally, Table 13 displays statistical comparisons of children's behaviour post-recess in the classroom and during a Physical Education period. The results indicate that there were significantly fewer adaptive behaviours observed in the classroom after recess ( $M = 13.38$ ,  $SD = 3.54$ ), compared to during Phys-Ed ( $M = 17.86$ ,  $SD = 2.61$ )  $t(20) = -5.68$ ,  $p < .001$ . Further, the frequency of problem behaviour observed post-recess in the classroom ( $M = 5.76$ ,  $SD = 3.66$ ) was significantly greater than during Phys-Ed ( $M = 1.38$ ,  $SD = 1.53$ )  $t(20) = 5.30$ ,  $p < .001$ .

To summarize, when comparisons of problematic and adaptive behaviours were made across the different contexts (recess, Phys-Ed, classroom), results revealed the same pattern of results for recess and Phys-Ed periods. More specifically, more adaptive behaviours and fewer problem behaviours were observed during recess and Phys-Ed periods than during classroom periods (before and after recess).

Table 13

*Comparisons of Children's Problem and Adaptive Behaviour Post-Recess in the Classroom, and during Phys-Ed*

	<u>Context</u>		<i>t</i>	<i>df</i>
	Classroom (Post-recess)	Phys-Ed		
Adaptive Behaviour	13.38 (3.54)	17.86 (2.61)	-5.68**	20
Problem Behaviour	5.76 (3.66)	1.38 (1.53)	5.30**	20

*Note.* \*\* =  $p < .001$ . Standard deviations appear in parentheses below means.

### **Relationship between Teacher, Child, and Observer Ratings of Behaviours: Pearson Product Moment Correlation Analyses**

A series of pearson product moment correlations were also performed on the data in order to answer the exploratory research question: What is the relationship between teacher ratings, child self-report ratings, and independent observer ratings of children's classroom behaviours? More specifically, correlations within and amongst observer, teacher, and student behavioural measures were computed. All of the significant correlations are displayed in Tables 14 through 19.

**Pre- and post-recess observations.** Table 14 presents the significant correlations for pre-recess and post-recess observations of children's adaptive and problem behaviours. The results indicate that pre-recess adaptive behaviours were negatively associated with pre-recess problem behaviours,  $r(19) = -.572, p < .001$ . Likewise, there was a negative correlation between post-recess adaptive and post-recess problem

behaviours,  $r(19) = -.826, p < .001$ . Further, pre-recess problem behaviours were negatively associated with post-recess adaptive behaviours,  $r(19) = -.448, p < .05$ , and positively associated with post-recess problem behaviours,  $r(19) = .499, p < .05$ .

Table 14

*The Relationship between Observer Ratings of Pre-Recess and Post-Recess Classroom Behaviour: Significant Correlations*

Measure	1	2	3	4
1. SOS pre-recess: adaptive behaviour	--	-.572**		
2. SOS pre-recess: problem behaviour		--	-.448*	.499*
3. SOS post recess: adaptive behaviour			--	-.826**
4. SOS post-recess: problem behaviour				--

Note. \*  $p < .05$ , \*\*  $p < .001$ .

**Within BASC teacher-report.** There were also significant correlations between several of the BASC teacher report subscales (see Table 15 or 16). In particular, the externalizing subscale was positively associated with school problems  $r(19) = .682, p < .001$ , and behavioural symptoms  $r(19) = .815, p < .001$ . In addition, there was a positive association among teacher ratings of internalizing problems and behavioural symptoms  $r(19) = .775, p < .001$ , as well as among school problems and behavioural symptoms  $r(19) = .754, p < .001$ . Finally, the adaptive skills scale was negatively associated with each of the problem behaviour subscales, including externalizing problems  $r(19) = -.721, p < .001$ , internalizing problems  $r(19) = -.636, p < .001$ , school problems  $r(19) = -.812, p < .001$  and behavioural symptoms  $r(19) = -.882, p < .001$ .

**Within BASC child self-report.** Further, significant correlations were revealed amongst the scales of the child self-report BASC-2 measure (see Tables 17 or 18). Specifically, child self-reported school problems were positively associated with inattention/hyperactivity  $r(19) = .635, p < .001$ , while self-reported internalizing problems were positively related to emotional symptoms  $r(19) = .021, p < .001$ . Moreover, children's sense of personal adjustment was negatively related to their self-reported internalizing problems  $r(19) = -.843, p < .001$ , inattention/hyperactivity  $r(19) = -.473, p < .05$ , and emotional symptoms  $r(19) = -.872, p < .001$ .

**Classroom observations and teacher ratings.** Table 15 and 16 present the significant correlations between observer ratings (pre/post recess SOS) and teacher ratings (BASC-2, TRS) of adaptive and problem behaviours in the classroom. As Table 15 illustrates, there was a negative association between observer ratings of pre-recess adaptive behaviours and teacher ratings of internalizing problems  $r(19) = -.436, p < .05$ . There were also negative associations amongst observer ratings of post-recess adaptive behaviours and teacher ratings of externalizing problems  $r(19) = -.547, p < 0.05$ , and school problems  $r(19) = -.477, p < .05$ . A positive association was found between post-recess ratings of children's adaptive behaviour and teacher-reported personal adjustment  $r(19) = .477, p < .05$  (see Table 16).

Moreover, observer ratings of pre-recess problem behaviours were positively associated with teacher reported externalizing problems  $r(19) = .625, p < .001$ , school problems  $r(19) = .525, p < .05$ , and behavioural symptoms  $r(19) = .654, p < .001$ , while it was negatively related to teacher-reported adaptive skills  $r(19) = -.565, p < .001$ .



Table 15

*Pre-Recess Classroom Observations and Teacher Ratings of Behaviour: Significant Correlations*

Measure	1	2	3	4	5	6	7
1. SOS pre-recess: adaptive behaviour	--	-.572**		-.436*			
2. SOS pre-recess: Problem behaviour		--	.625**		.525*	.654**	-.565**
3. TRS BASC: externalizing			--		.682**	.815**	-.721**
4. TRS BASC: internalizing				--		.775**	-.636**
5. TRS BASC: school problems					--	.754**	-.812**
6. TRS BASC: behavioural symptoms						--	-.882**
7. BASC: TRS- adaptive skills							--

Note. \*  $p < .05$ , \*\*  $p < .001$ .

Table 16

*Post-Recess Classroom Observations and Teacher Ratings of Behaviour: Significant Correlations*

Measure	1	2	3	4	5	6	7
1. SOS post-recess: adaptive behaviour	--	-.826**	-.547*		-.477*		.477*
2. SOS post-recess: problem behaviour		--					
3. TRS BASC: externalizing			--		.682**	.815**	-.721**
4. TRS BASC: internalizing				--		.775**	-.636**
5. TRS BASC: school problems					--	.754**	-.812**
6. TRS BASC: behavioural symptoms						--	-.882**
7. BASC: TRS- adaptive skills							--

Note. \*  $p < .05$ , \*\*  $p < .001$ .

**Classroom observations and child ratings.** Additionally, Table 17 and 18 present the significant correlations amongst observer ratings (i.e., pre/post recess SOS) and child self-report ratings (BASC-2, SRP) of adaptive and problem behaviours. As indicated in Table 17, pre-recess problem behaviours were positively related to child self-reports of school problems  $r(19) = .441, p < .05$ , and inattention/hyperactivity  $r(19) = .657, p < .05$ . Further, post-recess adaptive behaviours were negatively related to child self-reports of school problems  $r(19) = -.566, p < .001$ . Post-recess problem behaviours, on the other hand, were positively associated with child ratings of school problems  $r(19) = .486, p < .05$  (see Table 18).

Table 17

*Pre-Recess Classroom Observations and Child Self-Report Ratings of Behaviour:  
Significant Correlations*

Measure	1	2	3	4	5	6	7
1. SOS pre-recess: adaptive behaviour	--	-.572**					
2. SOS pre-recess: problem behaviour		--	.441*		.657**		
3. SRP BASC: school problems			--		.635**		
4. SRP BASC: internalizing				--		.921**	-.843**
5. SRP BASC: inattention/hyperactivity					--		-.473*
6. SRP BASC: emotional symptoms						--	-.872**
7. SRP BASC: personal adjustment							--

Note. \*  $p < .05$ , \*\*  $p < .001$ .

Table 18

*Post-Recess Classroom Observations and Child Self-Report Ratings of Behaviour:  
Significant Correlations*

Measure	1	2	3	4	5	6	7
1. SOS post-recess: adaptive behaviour	--	-.826**	-.566**				
2. SOS post-recess: problem behaviour		--	.486*				
3. SRP BASC: school problems			--		.635**		
4. SRP BASC: internalizing				--		.931**	-.843**
5. SRP BASC: inattention/hyperactivity					--		-.473**
6. SRP BASC: emotional symptoms						--	-.872**
7. SRP BASC: personal adjustment							--

Note. \*  $p < .05$ , \*\*  $p < .001$ .

**Teacher and child ratings.** Table 19 includes the significant correlations between teacher ratings (BASC-2, TRS) and child ratings (BASC-2, SRP) of behaviour. Overall, the results demonstrate positive relationships amongst most of the parallel subscales of the BASC teacher-report and child self-report measures. More specifically, there were positive associations amongst teacher and child reports of internalizing problems  $r(19) = .436, p < .05$ , as well as teacher-reported internalizing problems and child-reported emotional symptoms  $r(19) = .454, p < .05$ . Similarly, there were positive correlations between teacher and child ratings of school problems  $r(19) = .475, p < .05$ , as well as teacher-reported adaptive skills and child-reported personal adjustment  $r(19) = .510, p < .05$ . Additionally, teacher ratings of externalizing problems and child ratings of

school problems were positively associated  $r(19) = .512, p < .05$ . There was also a positive relationship between teacher-reported school problems and child-reported emotional symptoms  $r(19) = .436, p < 0.05$ . Moreover, positive correlations between teacher-reported behavioural symptoms and child self-reported school problems  $r(19) = .621, p < 0.001$ , internalizing problems  $r(19) = .469, p < .05$ , inattention/hyperactivity  $r(19) = .540, p < .05$ , as well as emotional symptoms  $r(19) = .475, p < .05$ , were noted.

Teacher ratings of adaptive skills, on the other hand, were negatively correlated with child reports of school problems  $r(19) = -.449, p < .05$ , internalizing problems  $r(19) = -.459, p < .05$ , and emotional symptoms  $r(19) = -.455, p < .05$ . Finally, child ratings of personal adjustment were negatively associated with several teacher-reported problem behaviour subscales, including behavioural symptoms  $r(19) = -.551, p < .001$ , school problems  $r(19) = -.447, p < .05$ , and internalizing problems  $r(19) = -.538, p < .05$ .

Table 19

*Teacher Ratings and Child Self-Report Ratings of Classroom Behaviour: Significant Correlations*

Measure	1	2	3	4	5	6	7	8	9	10
1. TRS BASC: externalizing problems	--		.682**	.815**	-.721**	.512*				
2. TRS BASC: internalizing problems	--	--		.775**	-.636**		.436*		.454*	-.538*
3. TRS BASC: School problems			--	.754**	-.812**	.475*			.436*	-.447*
4. TRS BASC: behavioural symptoms				--	-.882**	.621**	.469*	.540*	.475*	-.551**
5. TRS BASC: adaptive skills					--	-.449*	-.459*		-.455*	.510*
6. SRP BASC: school problems						--		.635**	.921**	
7. SRP BASC: internalizing problems							--			-.843**
8. SRP BASC: inattention/hyperactivity								--		-.473*
9. SRP BASC: emotional symptoms									--	-.872**
10. SRP BASC: personal adjustment										--

*Note.* \*  $p < .05$ , \*\*  $p < .001$

## **Qualitative Results**

### **Data Analysis**

In order to provide an additional perspective, and support the interpretation of the quantitative results, qualitative data was also collected. More specifically, open-ended child interview responses were organized, coded, and analyzed.

**Child Interviews.** While some general notes were recorded throughout the interview process, for the most part, the researcher recorded direct quotes of the participants in order to accurately capture their thoughts. In order to begin the analysis of this data, written responses corresponding to each participant were transcribed using Microsoft Word. This allowed the researcher to obtain a general sense of the data. Moreover, based on the themes of the questions included in the interview protocol, a general set of a-priori codes was generated. More specifically, the themes included children's perceived likes and dislikes of recess and Phys-Ed, as well as behavioural similarities and differences across contexts. Any additional ideas that emerged throughout the interview were also assigned codes. The coding consisted of breaking down the transcribed text into segments and assigning each segment a respective code. Lean coding, in which the researcher assigned codes and then expanded or reduced them accordingly, was also conducted. Finally, the data was analyzed by collapsing codes into broad themes. Each of these themes will be presented in the sections to follow.

## Findings

**Child perceptions of recess.** Given the structure of the interview protocol employed, the responses can be categorized according to what children liked, and disliked about the recess period.

*Recess 'likes'.* When the question *Do you like recess?* was posed to children, almost all provided a clear affirmative response (i.e., “yes”, “yeah”, “uh huh”). Only two children appeared to be less certain, responding “not really” (Participant #12; Grade 3, female) and “sometimes” (Participant #13; Grade 6, female). Despite this, all of the children, when prompted, expressed at least a few reasons for liking recess. These responses can be organized into three general categories, including: opportunities to have fun and socialize, take a break from work, and release energy.

*Opportunities for fun and social interaction.* Throughout the interview process, children often described recess as a period in which they were granted opportunities to have fun, play, and socialize with their peers. As one Grade 6 student put it, “It’s just fun. I like to talk to my friends or we like to play sometimes” (Participant #20; female). Overall, the majority of children pointed out that the recess period allowed them to engage in activities that they enjoyed, whether this was tag, basketball, skipping, or talking with their friends. For example, when Participant #15 was asked to elaborate upon what she liked about recess, she responded, “Because I play with my friends and we play games like house, [and] skipping rope” (Grade 3, female). Or, as Participant #6 noted, “I like to play basketball” (Grade 6, male).



In contrast to the more closely monitored academic environment of the classroom, children often described having a sense of freedom during recess. As expressed by Participant #16, “In class, you’re not allowed to talk about anything. At recess, you can run around and talk and do anything-- a little freedom. (...) I like to hang out with friends, talking, and playing games-- do silly things” (Grade 6, female). Similarly, Participant #18 stated, “[I like] that I can run and scream and shout without anyone saying anything ‘cause we’re outside” (Grade 6, male).

In general, opportunities for social interaction, which may not be provided within the classroom, seemed to be particularly important to children. As Participant #5 pointed out, “I get to talk to friends and hang out with them, and we get to have fun because then we have to go back to work” (Grade 6, female). This was also highlighted by Participant #12 who commented, “It’s fun because I really play with my friends a lot, ‘cause in class we don’t get a chance to talk” (Grade 3, female). Moreover, Participant #13 remarked, “[I like] being able to talk to my friends without getting yelled at” (Grade 6, female).

Besides the opportunities to socialize with classmates during recess, children also expressed enjoyment of play and interactions with students from other classrooms; for example, when asked what they like about recess, two children responded, “[I like] when Joey and I play together from the other class” (Participant #8; Grade 3, female), and “Seeing my friends from other classes” (Participant #13; Grade 6, female). As further elaborated by one Grade 6 student, “I like that I get to spend a lot of time with friends. They’re in other classes so I don’t get to see them a lot” (Participant #6; male).

*Taking a break from work.* Another common reason that children noted for liking recess was that, “It’s a good break from class” (Participant #19; Grade 6, male). For several children, recess seemed to provide an important relief away from the academic work of the classroom. As one child commented, “It’s fun to get out and be, like, not pressured” (Participant #3; Grade 6, male). Similarly, Participant #5 pointed out, “(...) we get to have fun because then we have to get back to work” (Grade 6, female). Adding to this, Participant #9 responded, “It gives me time to refresh my brain-- gives me a break” (Grade 6, female). Further insight on this topic was provided by one Grade 6 student who recalled her experiences prior to administrators’ introduction of the afternoon recess period during the school day. More specifically, she noted, “Before, when we didn’t have that recess, I was like ‘Oh I want to get outta here [class]. It’s two hours after lunch. At the end of the day, I ended up with a headache!’” (Participant #1, female).

*Release of energy.* Another positive perception held by students was that recess allows them to release energy that may become pent up throughout the school day. This opinion was clearly expressed by Participant #11, who commented “I think [recess is] very good— It really helps us get our energy out so that we don’t have to do that in class” (Grade 6, male). Several other students revealed similar sentiments; for example, one child noted, “Sometimes we play tag ‘cause I have a lot of energy, because at home, I don’t have time to erase all of my energy” (Participant #9, Grade 6, female). The viewpoint that recess provides an important opportunity for children to expend energy was also suggested by Participant #18. Commenting on his peers’ behaviour before the

inclusion of an additional recess period during the school day, he noted, “Before, the minute they got out of class, they would just run-- run around the school a few times, [and] throw tennis balls up on the roof” (Grade 6, male).

*Recess ‘dislikes’.* While many positive features of recess were noted, the majority of children (18 out of the 21) interviewed could also identify at least some aspect(s) that they disliked. Only three children (Participant #8, #17 and #18), could not identify anything in particular that they did not like. Participant #8 stated, for example, “I like everything” (Grade 3, female). Similarly, the only negative feature noted by Participant #18 was that the period is too short: “I don’t like that it’s only 15 minutes” (Grade 6, male). Overall, the responses of children who expressed negative views of the recess period can be aggregated into three general themes; that is: social/relational difficulties (e.g., bullying, arguments with peers, exclusion, etc.), adult-imposed rules or regulations, and boredom or dissatisfaction with schoolyard equipment.

*Social/relational problems.* The most common recess problem outlined by children can be described as social or relational difficulties. Several children, for example, recalled incidences of verbal and physical bullying in the schoolyard during recess. In particular, observed instances of bullying towards peers were recounted. As one Grade 6 student commented, “I don’t like when people are bullying other people. It’s not fun to see and sometimes they blame it on me” (Participant #2; male). Likewise, a Grade 3 student noted, “I don’t like when people get hurt (...) because there’s people in my class a lot that hurts people. They’re mean and lots of them say bad words” (Participant #12; female). Other children also recalled negative experiences in which they

themselves were bullied or taunted during recess. For example, a Grade 6 student noted, “I don’t like recess because there’s people that bully me (...) and when I go outside they push me around. It doesn’t happen any more but it used to” (Participant #9, female). As another child further explained, “Sometimes, outside, there’s not a lot of teachers so people call us names and they don’t know” (Participant #10; Grade 3, female).

Other negative social interactions within the school yard were also noted by children. To illustrate, Participant #14 pointed out, “I’m in peer mediation and a lot of fights happen at recess” (Grade 6, female). Moreover, a Grade 6 female student commented, “I don’t like the fighting at school with the boys” (Participant #21). Children also seemed to encounter difficulties with friends throughout the recess period. For example, when asked what she disliked about recess, Participant #5 responded, “If me and my friends get into a fight, [and] if I see one of my friends gets hurt, I feel like it’s all my fault” (Grade 6, female). Along similar lines, Participant #13 answered, “If I happen to be in a fight with friends, I end up standing alone and don’t have anyone to talk to” (Grade 6, female). Another child also expressed feelings of exclusion while participating in activities with peers; he stated, “There are some kids that I don’t like that much (...) but [during] some games, if I have to be a part of it, a couple of times they ran right passed me” (Participant #11; Grade 6, male). In addition to the social difficulties already mentioned, one child also suggested that there can be challenges associated with negotiating shared space with other children. He pointed out, “(...) sometimes when we’re playing a sport, little kids come out of nowhere and say we were here first, ‘cause we left to go get stuff” (Participant 6; Grade 6, male).

*Adult-imposed rules or regulations.* Children also expressed negative perceptions of recess rules or regulations controlled by school personnel. Some children, for example, expressed dissatisfaction with not having a choice between going outdoors or staying indoors for the recess period. As Participant #11 noted, "Once or twice they made us go outside even though we didn't want to because it was cold, and once I had a migraine" (Grade 6, male). Similarly, Participant #13 commented "If it's really cold, they force us to go outside" (Grade 6, female). In contrast, some children disliked having to stay indoors for recess even on days with unfavorable weather. As noted by Participant #18, "I don't like that I can't go outside in the rain" (Grade 6, male). This was also expressed by Participant #14 who responded, "Sometimes I don't like it because we have indoor recess" (Grade 6, female). Aside from these restrictions, one Grade 3 student noted discontent over having restricted access to certain schoolyard equipment. In particular, she stated, "We don't get to go on the park [play structure] because we're not allowed. They fixed it but [the principal] said not to go on it" (Participant #15). Another child in Grade 6 negatively commented on having to line up before entering the school building for recess; she stated, "I don't like to line up at the end. I feel like they're treating us in Grade 6 like little kids. I don't like being treated like a little kid" (Participant #16; Grade 6, female).

*Boredom or dissatisfaction with schoolyard equipment.* Additionally, some of the children interviewed seemed to express a sense of boredom during recess; Participant #4 noted, for example, "There's not really anything to do" (Grade 3, male). For children, this may be linked to having to create and organize their own activities, or with having

limited access to certain equipment. As one child commented, “Sometimes I guess [recess is] a little unorganized maybe” (Participant #19; Grade 6, male). Another child noted, “I wish our monkey bars would get fixed. [We] used to sit there and talk. There is a nice breeze up there” (Participant #5; Grade 6, female).

**Child perceptions of Phys-Ed.** Guided by the interview protocol, children’s perceptions of Phys-Ed can also be organized according to what they liked and disliked about this school period.

*Phys-Ed ‘likes’.* When asked if the children liked Phys-Ed, 19 of the 21 participants agreed. In fact, six of these children expressed particular enjoyment of Phys-Ed, providing responses such as “I love Phys-Ed” (Participant #14; Grade 6, female) or “It’s my favorite part of the day, along with music” (Participant #18; Grade 6, male). At least two children, on the other hand, appeared to be less enthusiastic towards their participation, indicating that they like Phys-Ed “most of the time” (Participant #11; Grade 6, male), and “sometimes” (Participant #13; Grade 6, female). Overall, however, all children could identify at least one reason for liking Phys-Ed, and most indicated several positive features. These responses can be organized into six distinct categories, which include: having activity choices, enjoyment of planned activities, characteristics of the teacher, opportunities to work with peers, learning and/or improving new skills, and fitness or health benefits.

*Activity choices.* When elaborating upon what they enjoyed about Phys-Ed, the majority of children mentioned having some opportunity to choose their own activities. As previously noted, the Physical Educator provided children at this school with a “free

choice” activity period every Friday, in which children were permitted to access a wider arrange of materials and have the flexibility to choose their own activity partners. This is described by one Grade 3 student who noted, “On Fridays it’s free play. There’s always a space for soccer and always mats. Friday we get to do whatever we want” (Participant #10; female). Another description was provided by Participant #8, who commented, “On Fridays we get free play. We can play either hockey or soccer-- The girls like to play with the mats,..make houses out of mats” (Grade 3, female). Throughout the interview process, children clearly expressed a liking for this free choice period, and described the types of activities they enjoyed most during this time. Participant #4, for example, noted, “I like free play—I choose the mats and hockey” (Grade 3, Male). Another student in Grade 6 commented, “I like when it’s free choice. We go on scooters, play around the gym” (Participant #14, female). One child also seemed to express particular appreciation of greater access to a wide array of materials, stating “I like free choice a lot because we can go in the [storage] rooms and there’s a lot of equipment” (Participant #17; Grade 6, male).

*Enjoyment of planned activities.* While children clearly enjoyed having some freedom to choose their own activities, many also noted positive perceptions of the teacher’s planning and organization of specific games throughout the week. As Participant #9 mentioned, “I like the activities Ms. Jennifer plans because usually they’re really fun” (Grade 6, female). Similarly, Participant #20 stated, “She [Ms. Jennifer] comes up with great games” (Grade 6, female). Moreover, for some students, these positive perceptions were linked to having a varied Phys-Ed program. As one Grade 3

student commented, “I like Ms. Jennifer’s games—I think she gets them from a book or something because there’s a lot” (Participant #10; female). Similarly, a student in Grade 6 pointed out, “I like [that] she gives us a new activity each week” (Participant #20; female). Suggesting an appreciation for a more organized activity program, Participant #19 also noted, “I like that when we do stuff it’s all organized, there’s a teacher there and no one’s fooling around” (Grade 6, male).

Further, many children identified the specific activities, and also sometimes equipment, that they enjoyed most during the Phys-Ed period. As one Grade 6 student commented, “This term, we’re working on scooters, like, handball scooter—it’s really fun!” (Participant #2; male). Describing an activity he enjoyed, another Grade 6 student noted, “There’s a new sport this year called Pizza-to-Go—it’s a tag game”. He further stated, “I like playing hockey a lot. I like the hockey equipment” (Participant #6; male). Similarly, Participant #18 pointed out, “I get to run a lot and I love running, and we get to do a lot of sports that I’m good at,.. tag and stuff like that” (Grade 6; Male).

*Characteristics of the teacher.* Another theme that emerged from the child interviews was a positive perception regarding the Phys-Ed teacher. As one child enthusiastically commented, “I like my teacher!” (Participant #12; Grade 3, female). This perception was mirrored by several other students, including Participant #18 who remarked, “My teacher—she’s awesome!” He further elaborated, “Other teachers are a bit, like, stiff. They wouldn’t laugh at the jokes I make, but Ms. Jennifer will just laugh and add to it” (Grade 6, male).



*Opportunities to work with peers.* In addition, children seemed to convey an appreciation for the opportunities to socialize and cooperate with their peers during Phys-Ed. Some children, for example, expressed enjoyment of working with a partner during games; “I like playing—I like having partners” (Participant #4; Grade 3, male). When asked to explain what she liked about Phys-Ed, another student responded, “Sometimes we play partners” (Participant #7; Grade 3, female). Several Grade 6 students also expressed a liking for group activities; for example, Participant #3 stated, “It’s fun—you get to do sports with your friends” (Grade 6, male). Further, Participant 20 commented, “[We] can partner up with friends or go in groups--She gives us choices” (Grade 6, female). Positive social interactions during Phys-Ed were also noted by Participant #11 who remarked, “(...) we are working on, like teamwork [in Phys-Ed], and plus, recently, we’ve been laughing a lot, like, our group” (Grade 6, male).

*Learning and/or improving new skills.* In addition, the opportunity to learn new games as well as develop or improve physical skills was also mentioned by children as a reason for liking Phys-Ed. One Grade 3 student, for example, simply noted “Ms. Jennifer teaches us new games” (Participant #7, female). Similarly, Participant #6 and #7 remarked, “I like learning new sports and stuff” (Grade 6, male), and “I like learning new games ‘cause it’s fun” (Grade 3, female). Highlighting the opportunity to develop or improve physical skills during Phys-Ed, Participant #3 remarked, “We get to play a lot of games, but it teaches us a lot of things, like coordination, so it’s not, like, a waste of time” (Grade 6, male). Along similar lines, a female student in Grade 6 explained, “Let’s say we skipped 100 times, next time we get to try to beat our score” (Participant #5;

female). Interestingly, one child also commented on the potential cognitive benefits of Phys-Ed; he noted, “[Phys-Ed is] like studying because she reads a whole list of things [e.g., rules] and you have to remember them” (Participant #9; Grade 6, female).

*Fitness or health benefits.* Finally, the fitness and/or health benefits associated with being physically active during Phys-Ed were also noted by some of the female children interviewed. Two children simply stated, “It’s a good workout” (Participant #13; Grade 6, female), and “It keeps me fit” (Participant #1; Grade 6, female). As Participant #1 elaborated, “It gets people getting active and eating healthy, knowing about certain parts of your body”. The opportunity to be physically active during Phys-Ed was also highlighted by child in Grade 3, who noted, “[What] I like about it is that I’m trying to do more exercise with my mom but we don’t get to a lot, but I get to exercise at gym” (Participant #12; female).

*Phys-Ed ‘dislikes’.* While all children identified reasons for liking Phys-Ed, three children did not express any dislikes, or stated, for example, “I like everything” (Participant #20; Grade 6, female). The majority of participants, however, identified at least some negative perceptions associated with Phys-Ed. These responses can be organized into several main ideas or themes, including: social difficulties and/or peers’ misbehaviour, mandatory participation in specific activities, as well as feeling tired, sore or dirty.

*Social difficulties and/or peers’ misbehaviour.* When asked to describe what they did not like about Phys-Ed, many children highlighted social difficulties that they encountered. Some children, for example, seemed to experience difficulties while

working with certain peers. As Participant #4 noted, “Well, there’s one really annoying person. It’s hard to explain” (Grade 3, male). Similarly, Participant #8 commented, [It’s hard to work with Susan—She’s always fighting or yelling. I tell her a few times to stop and then we go tell Ms. Jennifer” (Grade 3; female). Another child in Grade 3 elaborated, “When someone, like, calls me a name in gym, so I go tell the teacher (...). Almost every day at gym, I go tell Ms. Jennifer” (Participant 15, female).

Other potential social challenges, such as working with students who do not try their best” or who cheat during group activities, were also noted. As Participant #1 explained, for example, “I’m better as an individual usually, but if all people try their best, at least I could work with them” (Grade 6, female). Moreover, Participant #2 commented, “I don’t like how we’re playing the scooter game, and people cheat” (Grade 6, male). Similarly, Participant #11 explained, “The girls keep trying to steal our ball” (Grade 6, male).

Further, some children expressed dissatisfaction with other students’ misbehaviour during Phys-Ed (e.g., not listening to the instructions or rules). For example, when asked to describe what she did not like about Phys-Ed, Participant #7 responded, “When people be rude to Ms. Jennifer. People don’t listen and ask Ms. Jennifer what to do and she asks them ‘Were you listening?’” (Grade 3, female). Similar frustrations also seemed to be expressed by Participant #6 who noted, “Like, at the beginning, when we’re sitting [and] waiting for what to do, people are talking, and Ms. Jennifer hears and gets mad. The other day, it took like 25 minutes” (Grade 6, male).

*Mandatory participation in specific activities.* Aside from the social difficulties encountered during Phys-Ed, children disliked the teacher's expectation that they participate in activities that they did not enjoy. Overall, several children identified activities in which they did not wish to participate during Phys-Ed. When asked to discuss what she disliked about Phys-Ed, Participant #14, for example, commented "When we play soccer and I don't really like soccer. [There are] some games that I don't really find fun" (Grade 6, female). Another student noted, "I don't like running and we do a lot of laps" (Participant 16; Grade 6, female). Further, Participant #11 remarked, "The only thing I really hate is the 5-minute warm-up and the beep test" (Grade 6, male). At times, children expressed a desire to not participate in such activities due to fatigue or discomfort. As one Grade 6 student mentioned, "If you're tired, they don't really listen— You have to do it anyways. I don't like the stations and the beep test. Nobody likes that" (Participant #21, female). Along similar lines, Participant #9 explained, "When it's still a little cold and we have to run four laps around the track. We have to run and try to beat your time. [It] hurts my lungs and throat" (Grade 6, female). Additionally, one child disliked activities that he perceived to be more competitive; he stated, "Sometimes, if we have to do the beep test, I don't like that. It's kind of like a competition" (Grade 6, male).

Overall, children described the Phys-Ed program as quite varied; however, the repetition of certain activities was negatively perceived by some children. As one child expressed, "What I don't like is that sometimes we always do the same thing" (Participant #10; Grade 3, female). Participant #3 also noted, "Sometimes we play a game like over and over again. It's like, 'Can we play something else now?' " (Grade 6, male).

*Feeling tired or sore or dirty.* Adding to the ideas previously presented, some children disliked experiencing feelings of fatigue, soreness or dirtiness when participating in Phys-Ed. One Grade 6 student, for example, stated, “I like the scooters, but I don’t like them ‘cause you get dirty and your legs start to hurt”. Another child recalled, “Before, when we were using scooters, something happened to my thumb” (Participant #11; Grade 6, male). Participant #21 also described negative physical sensations associated with working hard during Phys-Ed. She explained, “Sometimes I run so hard, I feel like I’m going to vomit. You force too much and you feel like [you are] going too much overboard” (Grade 6, female). Further, Participant #13 remarked, “She [Ms. Jennifer] gets mad at us if we don’t want to do the things she asks, like running and a ton of push ups. She works us hard” (Grade 6, female).

**Child comparisons of their behaviours during recess and Phys-Ed.** When children were asked to compare the way they behaved and socialized across recess and Phys-Ed periods, almost all children identified at least one similarity or difference. Two children in Grade 3, however, could not identify any precise similarities or differences in their behaviour and social interactions across contexts. More specifically, they responded to the interview question with only “We act the same” (Participant #15, female), or no response. Even with further prompting and re-phrasing of the question, no additional details were provided by these children. As such, it is possible they did not understand the question, or simply could not formulate a response to it at that time. Overall, however, children that were able to make behavioural comparisons highlighted a variety

of similarities and differences across contexts. These will be outlined within the following section.

*Differences across contexts.* Throughout the interview process, it became clear that children perceived their behaviour to be quite different during recess compared to Phys-Ed. Generally, the differences noted can be categorized into three general themes: organization and structure, supervision and space, and activity levels

*Organization and structure.* Many of the behavioural differences noted by children can be attributed to the organization and structure of recess and Phys-Ed contexts. Throughout the interview process, several children provided descriptions of such contextual differences. For example, while describing Phys-Ed, one child explained “It’s just different because it’s planned” (Participant #9; Grade. 6, female). Generally, recess was described as a context in which children self-direct their own games and activities; for example, one child remarked, “I like to play sports and stuff outside—football and basketball” (Participant # 19; male). Phys-Ed, on the other hand, was described as a setting in which activities are primarily organized and directed by the teacher. As one Grade 6 student noted, “In recess we try to get as many people as we can to play, because if there’s not a lot of people it’s not as fun. During Phys-Ed, she [Ms. Jennifer] says what we have to do and normally we have fun”. Further, he remarked, “In Phys-Ed, it’s all organized ‘cause it’s all together, but during recess, we’re running around trying to get people together” (Participant #6; Grade 6, male). Along similar lines, Participant #20 explained “Phys-Ed is different because she arranges games to play, and at recess we talk with friends and let loose” (Participant #20, Grade 6, female).

Another perceived difference between recess and Phys-Ed was related to children's opportunities to make choices across contexts; specifically, in terms of activities they engage in, and with whom. As one Grade 6 student noted, "In Phys-Ed, we don't have a choice of what we do, but at recess, we do" (Participant 11; male). Another student pointed out, "At recess, I don't have to hang out with people I don't like, but in Phys-Ed, if we're on the same team, we have to" (Participant #13; Grade 6, female).

Several other children also provided insights into how the differential structuring or organization of recess and Phys-Ed shapes their behaviours. As Participant #1 noted, "I just, like, hang out with friends and talk at recess. I stay focused in Phys-Ed" (Grade 6, female). Similarly, Participant #2 commented, "At recess, I just have fun, and at Phys-Ed, I just be serious. I do my thing" (Grade 6, male). Participant #14 also commented, "At recess, we talk and during Phys-Ed, we do something" (Grade 6, female).

*Supervision and space.* Other behavioural differences noted by the children were related to the presence of adult supervision, as well as the amount of space provided during recess compared to Phys-Ed. The larger outdoor space utilized during recess, seemed to provide some children with a greater sense of freedom, and the ability to engage in an array of activity. As Participant # 10 stated, "At Phys-Ed, we have to be careful not to bang into walls, but at recess we don't. We get to do whatever we want. Outside is very very big" (Grade 3, female). As some children suggested, the more spacious recess environment may also have had an impact on the types of social interactions, and perhaps social problems, which occurred within this context. For

example, one Grade 6 student noted, “Usually, when I talk in Phys-Ed it’s just talking, but outside it could be more private talking because there’s a big yard outside” (Participant #17; Grade 6, male). As well, Participant #4 revealed, “I usually be bad at recess, but at Phys-Ed, the teacher is really nice to me. I’m better at Phys-Ed than at recess. It’s a big place outside. You can, like, hide from teachers” (Participant #4; Grade 3, Male).

Given the size and layout of the school yard, it may be that behaviour was less closely monitored. Moreover, the behavioural expectations of adults may have been more relaxed within this context. As one child commented, “I behave differently at recess because they’re not as strict when we’re outside, plus we get to talk to our friends” (Participant #11; Grade 6, male). In contrast, during Phys-Ed, children may have been more closely supervised by the teacher, whose expectations of behaviour are, perhaps, similar to those of a regular classroom teacher. As participant #19 suggested, “It’s different in Phys-Ed because, in Phys-Ed, there’s a teacher and they’re the same as other teachers” (Grade 6, male).

*Activity levels.* Finally, some children also noted differences in their activity levels during recess and Phys-Ed. More specifically, they suggested that they were, typically, more active in Phys-Ed. As one student commented, “At recess, I’m more calm. (...) In Phys-Ed, I just run and, like, kill myself!” (Participant #1; Grade 6, female). Another student also noted, “(...) during Phys-Ed you have to be more active” (Participant #20, Grade 6, female).



*Similarities across contexts.* Although children perceived many more differences in their behaviour across recess and Phys-Ed contexts, some similarities were also noted. These responses can be organized according to the following two themes: activities, and opportunities for social interaction.

*Activities.* When similarities between recess and Phys-Ed were identified by children, they tended to speak about the activities that they perform during both periods. Simply put, one child stated, “[The] activities are similar” (Participant #3; Grade 6, male). The greater degree of flexibility and opportunity to select activities during ‘free choice’ Phys-Ed periods was also compared to those provided during the recess period. As Participant #9 mentioned, “When it’s free play, we can do whatever we want, just like recess” (Grade 6, female).

*Social interaction.* Some children also expressed similarities regarding the opportunities provided for social interaction, as well as the occurrence of social difficulties, during both school periods. For example, one Grade 6 student explained “[I behave] pretty much the same. In Phys-Ed, even when I’m playing a sport we’re supposed to be doing, I talk with my friends and chill” (Participant #16; female). Another student remarked, “I find [my behaviour is] the same, but if we get into a fight at recess it continues at gym” (Participant #5; Grade 6, female).

### **Section Summary**

In summary, the majority of children interviewed expressed positive perceptions of their participation in both recess and Phys-Ed. Further, they typically elaborated upon a variety of reasons for their enjoyment of these periods; however, they also described

negative components of both. Upon comparing the themes associated with each physical activity period, some similarities and differences can be noted. For example, while children expressed positive views of the opportunities to engage in social interaction, and negative views of social problems encountered during both periods, the specific nature of these interactions generally differed across contexts. In terms of positive social interactions, children described talking, hanging out, or playing with friends during recess, but more frequently discussed working in partners or groups during Phys-Ed. In relation to negative social interactions, bullying and fighting were emphasized as having occurred during recess, whereas difficulties related to working with certain peers, and other students' misbehaviour, were described as having occurred during Phys-Ed.

Another similar theme in relation to recess and Phys-Ed may be that children described themselves as active during both school periods. For example, several children spoke about releasing energy through games like tag during recess. Similarly, they identified specific games or activities that they enjoyed during Phys-Ed. Although active behaviour was described in both contexts, some children perceived differences in their activity levels; in particular, they viewed themselves as more active during Phys-Ed compared to recess. Moreover, children only noted fitness and health benefits associated with being physically active as a positive feature of Phys-Ed.

A further similarity across contexts may be related to the types of activities children engaged in. During the interviews, some children made comparisons between the activities they chose during recess, and those selected during free choice Phys-Ed periods. During these periods, activities may be similar because children are provided

with choices. Unlike recess, however, children are not provided with a choice of activities every Phys-Ed period. As such, some children noted dissatisfaction with limited or no activity choice (i.e., being expected to participate in a specified activity) during Phys-Ed.

Reflecting upon the themes which emerged through discussions of recess and Phys-Ed, one additional difference may be noted. As revealed during the child interviews, recess was viewed as an opportunity to have fun, socialize, and take a break from school work. In contrast, children spoke about opportunities to learn and improve skills during Phys-Ed, and at times, also described feeling, tired, sore or dirty associated with working hard during this period. Taken together, these perceptions may suggest that Phys-Ed was perceived to be an educational environment in which work and learning took place (as in the classroom). Recess, on the other hand, appeared to be viewed as a unique environment associated with freedom and fun.

## Two Illustrative Case Studies

In an effort to explore individual differences among children in relation to the impact of physical activity contexts on behaviour, two children were selected for a more comprehensive analysis. More specifically, all of the observational, teacher-reported, self-reported, and qualitative interview data collected for these participants will be described in an attempt to provide insight into the interaction of individual and contextual factors on behaviour. The selection of these participants was based on the scores they obtained on teacher- and self-reported assessments of their behaviour. Both of these children presented extreme, yet distinct, cases in which several composite scores on both behavioural assessments (SRP and TRS) were within the At-Risk or Clinically Significant classification range according to the BASC-2 manual (Reynolds, & Kamphaus, 2004).

### Case #1: Donnie

**Physical description and general impression of the child.** Donnie was a male student in Grade 6. At the time of data collection he was approximately 11 years and 10 months of age. He had a slim build, and appeared to be of an average height for his age. As well, he had short dark-brown hair, a medium-dark complexion, and brown eyes. While at school, he was often observed wearing sneakers and jeans with bright colored t-shirts.

While within the school context, the general impression that I developed of Donnie was that he was a talkative and outgoing boy with a sarcastic sense of humor. He also appeared to be generally well liked by his classmates, as he was often (informally)

observed interacting with both male and female students within the school context and outside during recess. As well, during a personal interaction with Donnie, he described a great deal of enjoyment in sports, commenting, “[I like] anything but tennis”. Moreover, he expressed confidence in his sport skills and athletic ability.

Through other informal observations and discussions, it also appeared as though Donnie had a very positive, amicable relationship with the Phys-Ed teacher. On several occasions they were observed laughing, teasing, and joking with one another. This occurred during the Phys-Ed period as well as during transition periods throughout the day. While in conversation with the Phys-Ed teacher, she described him as a “good kid” who does not have any harmful intentions towards others. Despite this, she admitted that he could sometimes exhibit behaviours that were quite challenging. While present within the gymnasium during Phys-Ed, these challenging behaviours were sometimes observed. On one occasion, while the teacher was outlining instructions or rules for an activity, Donnie was observed to repeatedly call out and interrupt. He was disruptive several times, even after being told to stop, until the teacher used a louder and stern tone of voice. Overall, the Phys-Ed teacher seemed to acknowledge that, although his behaviours, at times, could be “annoying”, she also felt that they could be addressed relatively easily.

Another example of Donnie’s challenging behaviour was observed while he worked in the computer lab within his homeroom class. Although he was assigned independent work in the computer lab, he was observed to repeatedly talk with two girls seated at computers to his immediate right. He continued to initiate conversation and laugh with the girls even after the teacher had repeatedly reminded him, and the class, not

to talk. After noticing Donnie's behaviour, the classroom teacher eventually separated the girls seated beside him, moving them each to different locations in the computer lab.

Upon doing so, she commented, "I know this isn't the same as our class, but we still have to get work done".

**Self-Reported Behaviour.** Aside from the general impressions garnered while present within the school context, an enhanced awareness of Donnie's self-perceived personality and behaviour was attained through the completion of a self-report BASC-2 assessment. Upon administering and scoring this assessment, some composite scores falling outside of the typical range were noted. As presented in Table 20, the T Score obtained was 73 for School Problems, and 78 for Inattention/Hyperactivity subscales, which both fell within the Clinically Significant classification range. More specifically, within the School Problems subscale, Donnie's score for the Attitude to School scale fell within the At-Risk range (T Score = 63). This suggests that he generally disliked being in school, and sometimes wished to be elsewhere. Moreover, the T Score obtained for Attitude to Teachers, fell within the Clinically Significant classification range (T Score = 77). This indicates that Donnie had some negative perceptions of teachers; for example he may generally consider them to be unfair, cold, and/or severe. For the Inattention/Hyperactivity category, Donnie also scored within the Clinically Significant classification range for both Attention Problems and Hyperactivity scales. These results indicate that Donnie had difficulty maintaining adequate levels of attention within the school context, and tended to display an unusually high number of disruptive behaviours compared to others his age.

Moreover, although the overall T Score for the Internalizing Problems composite scale fell within the typical range (T Score = 46), within this category, the score corresponding to Locus of Control (T Score = 60) fell within the At-Risk range. This suggests that Donnie felt as though he had little control over life events, and at times, felt blamed for things that he did not do.

Aside from the behaviours already noted, Donnie reported typical levels on measures of Emotional Symptoms Index (T Score = 44), and Personal Adjustment (T Score = 54).

Table 20

*Donnie: Self Report of Personality (SRP) Composite Score Summary*

Composite Scale	T Score	Percentile Rank	95% Confidence Interval
School Problems	73	97	65-81
Internalizing Problems	46	40	42-50
Inattention/Hyperactivity	78	99	70-86
Emotional Symptoms Index	44	28	39-49
Personal Adjustment	54	61	47-61

**Teacher-reported behaviour.** Further insights into Donnie's behaviour within the school context were obtained through his classroom teacher's completion of a parallel BASC-2 assessment. On the teacher-reported measure, Donnie scored within the At-Risk classification range on the School Problems (T Score = 61), and Behavioral Symptoms Index (T Score = 62) scales (see Table 21). More specifically, within the School Problems composite scale, a T Score falling in the At-Risk classification range was attained for Attention Problems (T Score = 68). This may provide further evidence that

Donnie had difficulties maintaining necessary levels of attention during the school day. Additionally, within the Behavioral Symptoms Index scale, a T Score of 76 was obtained for Atypicality. This score fell within the Clinically Significant range, and suggests that Donnie may have sometimes appeared disconnected from his environment, or displayed strange behaviours.

Although the overall T Scores for Externalizing Problems (T Score = 59) and Adaptive Skills (T Score = 41) composite scales fell within the typical classification range, the scores obtained for some corresponding items were within the At-Risk or Clinically Significant range. In particular, within the Externalizing Problems category, Donnie scored within the Clinically Significant range for Hyperactivity (T Score = 74), indicating that he appeared restless or overactive, and may have had trouble controlling his impulses in the classroom. Scores within the At-Risk classification range were also attained for Study Skills (T Score = 38) and Functional Communication (T Score = 36) within the Adaptive skills composite scale. These results suggest that Donnie displayed weak study skills, or poor organization, as well as poor expressive and receptive communication skills. Finally, unlike the behaviours previously noted, Donnie was *typical* of other children his age on all measures of internalizing problems (T Score = 52).



Table 21

*Donnie: Teacher Rating Scale (TRS) Composite Score Summary*

Composite Scale	T Score	Percentile Rank	95% Confidence Interval
Externalizing problems	59	84	56-62
Internalizing Problems	52	66	46-58
School Problems	61	86	56-66
Behavioural Symptoms Index	62	89	59-65
Adaptive Skills	41	19	38-44

In summary, given the correspondence between teacher-ratings and child-ratings on some categories of behaviour, two primary areas of concern seem to be Donnie's difficulty paying attention and hyperactivity within the school context. The impact of such difficulties may also be reflected in teacher ratings of the child's study skills, and functional communication. It could be that his difficulty controlling behavioural impulses, and maintaining appropriate levels of concentration in the classroom, have disrupted to his academic performance.

**Observational data.** Provided with a clearer picture of Donnie's behavioural strengths and weaknesses, his observed behaviours across school contexts (i.e., pre- and post-recess, during recess, and Phys-Ed) will also be examined. More specifically, the research questions previously outlined will be explored at an individual level, and comparisons to the group results will be made.

Observations of Donnie within the school context took place at the end of March 2010. The frequencies of problem and adaptive behaviour observed across classroom (pre- and post recess) and physical activity periods (recess and Phys-Ed) are displayed in

Tables 22 and 23. Additionally, Figure 6 and 7 present comparisons of Donnie's behaviour scores and the sample averages of problem and adaptive behaviour across each of the observational contexts.

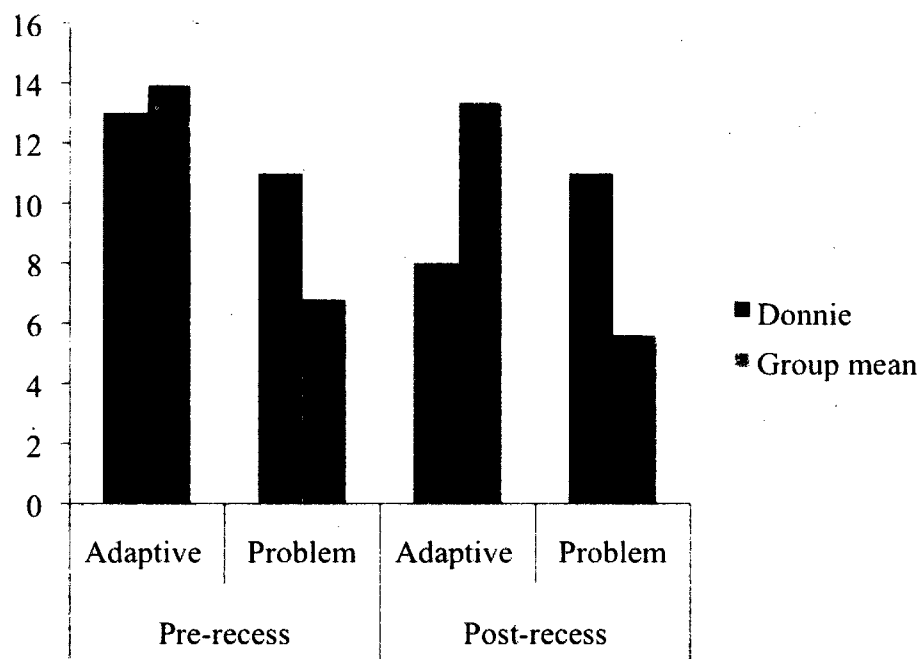
*Comparisons of pre and post-recess.* As Table 22 illustrates, Donnie displayed more adaptive behaviours pre-recess (total = 13) than post-recess (total = 8) in the classroom; however, he displayed the same number of problem behaviours before and after recess (total = 11). Donnie's adaptive behaviour pattern seems to differ from that of the sample average, as no statistical differences between pre-recess and post-recess adaptive behaviours were revealed. On the other hand, Donnie's problem behaviour pattern is similar to the results obtained through group analyses of pre and post-recess problem behaviour.

Although Donnie's behaviour patterns pre- and post-recess in the classroom are relatively similar those revealed through statistical analysis of the sample, he generally displayed fewer than the average number of adaptive behaviours, and more than the average number of problem behaviour, during pre- and post-recess observations (see Figure 6). A lower score of adaptive behaviour, compared to the sample average, is particularly apparent post-recess in the classroom; whereas his scores of problem behaviour were higher than the sample average both pre- and post-recess.

Table 22

*Donnie: Frequency of Adaptive and Problem Behaviour Pre- and Post- Recess in the Classroom*

Variable	Pre-Recess	Post-Recess
Adaptive behaviour	13	8
Problem behaviour	11	11



*Figure 6.* Pre-recess and post-recess classroom observations: Donnie's adaptive and problem behaviour compared to the group means.

**Comparisons of recess and Phys-Ed.** Moreover, as depicted in Table 23, Donnie displayed a relatively similar amount of adaptive behaviour during recess (total = 19) compared to Phys-Ed (total = 16) periods. Moreover, he displayed no problem behaviours

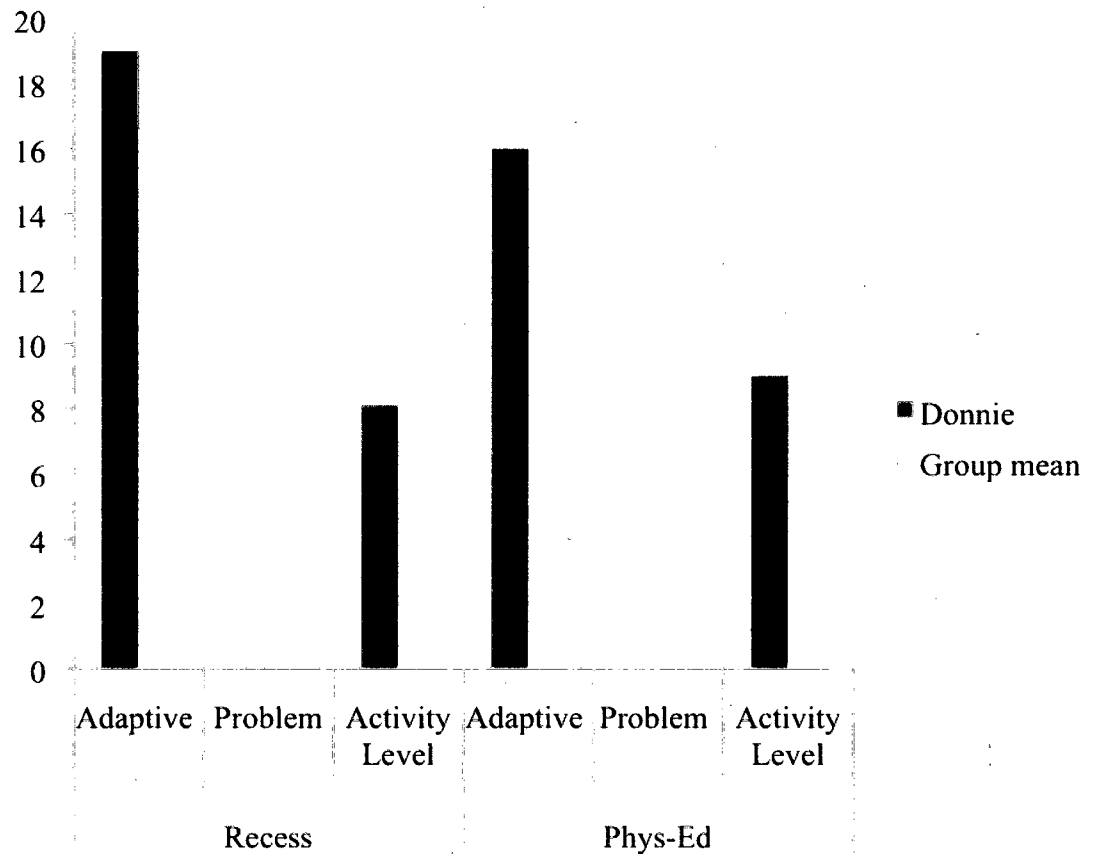
within either of these school contexts (total = 0). Donnie also displayed nearly the same activity level during recess (total = 8.1) and Phys-Ed (total = 8). More specifically, his activity level scores indicated that he performed activities at a moderate intensity, on average, during both school periods. Overall, these behaviour patterns were similar to the results obtained through analyses of the sample averages; in particular, the finding that there were no differences between children's adaptive behaviour, problem behaviour, and activity levels across recess and Phys-Ed contexts.

Overall, in comparison to the sample averages, Donnie displayed slightly more adaptive behaviours, and slightly fewer problem behaviours, during the recess period. Further, he displayed fewer adaptive behaviours and fewer problem behaviours than other participants, on average, during Phys-Ed. In addition, his overall activity levels were somewhat lower than the *average* activity levels noted during recess and Phys-Ed periods.

Table 23

*Donnie: Frequency of Adaptive and Problem Behaviour during Recess and Phys-Ed*

Variable	Recess	Phys-Ed
Adaptive behaviour	19	16
Problem behaviour	0	0
Composite activity level	8.1	8



*Figure 7.* Recess and Phys-Ed observations: Donnie's adaptive and problem behaviour compared to the group means.

***Comparisons of classroom and physical activity periods.*** In addition to those already outlined, further comparisons can be made of Donnie's behaviour within classroom and physical activity contexts. Similar to the sample results obtained, Donnie displayed far fewer problem behaviours during recess (total = 0) and Phys-Ed (total = 0) compared to pre- (total = 11) and post-recess (total = 11) in the classroom. As well, he displays more adaptive behaviours during physical activity periods (recess total= 19; Phys-Ed total = 16) than classroom periods (pre-recess total= 13; post-recess total = 8).

**Child perceptions of recess and Phys-Ed.** To support the quantitative data collected, Donnie (and all other children included in the sample) was asked to describe his perceptions of recess and Phys-Ed, as well as his behaviour across these contexts. Like most other children, Donnie expressed positive perceptions of both recess and Physical Education periods; however, unlike many other children interviewed, Donnie mentioned no dislikes of either physical activity period. More specifically, in relation to recess, his only negative perceptions corresponded with wishing to have more time outdoors, or of not being able to go out for recess when was raining. Further, when prompted to elaborate upon the positive features of recess, he noted several.

When discussing his reasons for liking recess, he spoke mainly about enjoying the freedom provided, as well as the opportunity to release energy through physical activity. He stated, for example, “But really, though, [recess is] 15 minutes, and everybody’s waiting two hours for that 15 minutes to get out of class”. After a brief pause, he continued “[I like] that I can run and scream and shout without anyone saying anything because we’re outside. (...) We play ‘Manhunt’ and there’s a lot of running in that, so I run like crazy”.

Next, when asked about his perceptions of Phys-Ed, his response appeared to be especially positive, commenting “It’s my favorite part of the day, along with music”. Similar to his reason for liking recess, he noted an enjoyment of being able to release energy, and participate in physical activity. In particular, he commented, “I get to run a lot and I love running, and we get to do a lot of sports that I’m good at,..tag and stuff like that”. In addition to this, he emphasized a liking for the Phys-Ed teacher. For example,

when prompted to discuss other reasons for liking Phys-Ed, he exclaimed, “My teacher— She’s awesome! Other teacher’s are a bit, like stiff. They wouldn’t laugh at the jokes I make, but Ms. Jennifer will just laugh and add on to it”. These comments further suggest that there was a positive relationship between Donnie and his Phys-Ed teacher.

Finally, when asked to compare his behaviour and social interactions across recess and Phys-Ed contexts, he initially focused on the contextual features of each period rather than behaviour. For example, he said “Recess is 15 minutes, where Phys-Ed is either an hour or 30 minutes (...). At recess, usually, we can’t take balls out because she doesn’t want us to lose them again”. Subsequent to this, however, he did provide further insights into his perceptions of both contexts, highlighting a preference for Phys-Ed over recess. He ended the interview by commenting, “Sometimes it’s boring outside, but Phys-Ed is never boring for me. I’d rather have that than recess”.

**Summary and interpretations.** Overall, Donnie, and all children interviewed, expressed some positive perceptions of recess and Phys-Ed periods -- Both contexts provide some freedom from the regular classroom context, as well as the opportunity for children to release energy. Since it may be particularly difficult for a child like Donnie to meet the behavioural expectations of the classroom teacher (i.e., sitting still, listening, and not interrupting during the lesson), it may not be surprising that he displayed more adaptive and fewer problematic behaviours within physical activity contexts (i.e., recess and Phys-Ed) where such expectations were less highly emphasized.

Although Phys-Ed is typically more structured and organized than recess, it also provides children with a greater degree of freedom than the classroom, as well as the

ability to expend energy. In fact, it may be that the degree of structure and organization provided during Phys-Ed, in combination with opportunities provided to be physically active, provided a particularly enjoyable experience for a child such as Donnie.

Although statistical and individual comparisons reveal no large differences in behaviour across physical activity contexts, Donnie's preference for Phys-Ed over recess may suggest that children can derive unique benefits from school contexts that complement their specific characteristics and needs.

### **Case #2: Hailey**

**Physical description and general impression of the child.** Hailey was a female student in Grade 6. When observed in the school context, she was approximately 12 years and 2 months of age. She had blonde, medium length hair, big blue eyes, and a roundish face. She appeared to be of an average or slightly below average height, and had a somewhat stinky build. She was often observed wearing casual attire, such as jeans or leggings, various colored t-shirts, as well as a black sweater with the school name and logo printed on the front.

I first met and interacted with Hailey in the Spring of 2009 while volunteering at the research site. At this time, I often worked alongside the Social Aide Technician in the school context. During the lunch hour, for example, I would sometimes provide assistance while she met with students in her room. She met with students who, primarily, needed some extra guidance or support throughout the school day. At this time, Hailey visited the Social Aide Technician on a weekly or bi-weekly basis, and I was present during at least two these lunch sessions. When introduced to her, the first



impression I had was that she was a friendly and relatively social student. Like many pre-adolescent girls, she appeared to be quite interested in the latest television, movie, and music trends (such as the television show, *Glee*, the movie, *Twilight*, and the pop musician, Justin Bieber). With more frequent interactions, however, I eventually developed greater insights into her general personality and experiences at school. During the lunch sessions with the Social Aide Technician, she often spoke about general life issues, school problems, and social conflicts.

While in the school context, she was frequently observed interacting with approximately five of the same Grade 6 girls. Through informal observation of their group interactions, it appeared as though two of these girls displayed more dominant and/or leadership characteristics, while the others (including Hailey) displayed these characteristics to a lesser extent. The two more dominant girls seemed somewhat exclusive in their interactions, and also appeared to be quite popular with other students, in general. At times, it seemed as though Hailey struggled to be included in their interactions. In general, she often seemed to display a neutral expression, and it was rare that she was observed to be overly enthusiastic or excited within the school context.

**Self-reported behaviour.** In addition to the general impressions outlined above, Hailey's completion of the self-report BASC-2 assessment provided further information about her perceived behaviour and experiences at school. Upon administering and scoring this assessment, it was found that all of Hailey's Self-Report composite scale scores fell outside of the typical classification range. Table 24 displays a summary of the T Scores obtained for this assessment.

Two of the scale scores fell within the At-Risk range; these included School Problems (T Score = 62) and Inattention/Hyperactivity (T Score = 62). Within the School Problems category, the score for Attitude to Teachers was particularly high (T Score = 73), falling within the Clinically Significant range of scores. This result indicates that Hailey may have viewed teachers as unjust, indifferent and/or overly demanding. Moreover, within the Inattention/Hyperactivity scale, she scored within the At-Risk range for Attention Problems (T Score = 66), which suggests that she had some difficulty maintaining focus in the classroom.

In addition to these scores, each of the remaining composite scores for Internalizing Problems, Emotional Symptoms Index, and Personal Adjustment fell within the Clinically Significant classification range. The T Score for Internalizing problems was 79. More specifically, Hailey obtained a score within the Clinically Significant range for Atypicality (T Score = 91), Locus of Control (T Score = 70), and Anxiety (T Score = 73). Also, the scores for Social Stress (T Score = 66) and Depression (T Score = 63) fell within the At-Risk range. These results indicate that Hailey reported a range of internalizing symptoms; these included, having unusual thoughts or perceptions, a sense of little control over life events, excessive worrying or nervousness, difficulty maintaining close relationships, or feeling lonely, as well as feeling sad or misunderstood. In addition to these results, the T Score for the Emotional Symptoms Index scale was 75, and for Personal Adjustment it was 34. In terms of Personal Adjustment, the T Score for Self-Esteem fell within the Clinically Significant classification range. As such, Hailey reported a negative self image, in relation to both

her personal and physical features. Additionally, a T Score falling within the At-Risk range was attained for Self-Reliance, indicating that she may have had little confidence in her ability make decisions, and/or solve problems without assistance.

Table 24

*Hailey: Self Report of Personality (SRP) Composite Score Summary*

Composite Scale	T Score	Percentile Rank	95% Confidence Interval
School Problems	62	89	55-69
Internalizing Problems	79	99	75-83
Inattention/Hyperactivity	62	88	54-70
Emotional Symptoms Index	75	98	71-79
Personal Adjustment	34	7	28-40

**Teacher-reported behaviour.** Scoring of the teacher-report BASC-2 assessment also revealed some composite scores within the At-Risk or Clinical Classification range (see Table 25). In particular, the score for Behavioural Symptoms Index (T Score = 62) fell within the At-Risk range. Within this category, Hailey scored within the At-Risk range for Atypicality (T Score = 61) and Withdrawal (T Score = 63). These scores indicate that she engaged in behaviours that may be considered strange or odd, and had some difficulty making friends or entering into group activities. Moreover, the overall scale score for Internalizing Problems (T Score = 75) fell within the Clinically Significant range. Specifically, the scores for Anxiety (T Score = 69) and Somatization (T Score = 63) were within the At-Risk range. As such, the classroom teacher reported that Hailey, at times, displayed behaviour due to worry or nervousness. In addition, she tended to

display health concerns without any serious health issue present, which may suggest an underlying emotional problem. Also within this category, the score for Depression (T Score = 81) fell within the Clinically Significant range, which indicates that Hailey sometimes appeared withdrawn, sad and/or pessimistic.

Although the teacher-reported score for Adaptive Skills was within the typical range (T Score = 44), the score for a corresponding item, Adaptability (T Score = 39), was within the At-Risk range. This result indicates that Hailey seemed to have difficulty adapting to changes, and/or took longer to recover from setbacks or difficulties. Aside from the composite scales noted above, the scores for Externalizing Problems (T Score = 48) and School Problems (T Score = 53), as well as all corresponding items, were within the typical range.

Table 25

*Hailey: Teacher Rating Scale (TRS) Composite Score Summary*

Composite Scale	T Score	Percentile Rank	95% Confidence Interval
Externalizing Problems	48	52	45-51
Internalizing Problems	75	98	69-81
School Problems	53	68	48-58
Behavioural Symptoms Index	62	89	59-65
Adaptive Skills	44	27	41-47

Taken together, the self-report and teacher-report behaviour assessments highlighted that Hailey was having difficulties in at least a few areas of functioning. A primary area of concern for Hailey may be her display of internalizing symptoms, especially, anxiety and depression. As well, both teacher- and self-reports of behaviour

suggested that Hailey may, at times, have displayed behaviour considered strange, or that she appeared disconnected from her surroundings. As such, another area of concern may be her display of atypicality. Overall, it is possible that Hailey's social and emotional difficulties have impacted her behaviour and social interactions within the school context.

**Observational data.** Observations of Hailey within the classroom, as well as during recess and Phys-Ed were completed in early-mid February. Tables 26 and 27 display the frequency of problem and adaptive behaviours observed across classroom (pre- and post-recess) and physical activity periods (recess and Phys-Ed). Within this section, the research questions will be explored at an individual level, using the observational data collected of Hailey. Moreover, comparisons between Hailey's behaviour and the group results will be made.

*Comparisons of pre- and post-recess.* Unlike the results obtained through quantitative analysis of the sample averages, Hailey displayed enhanced behaviours post-recess compared to pre-recess in the classroom (see Table 26). Whereas no differences were noted between average scores of problem and adaptive behaviour before and after recess, Hailey displayed a slightly greater number of adaptive behaviours (total = 6), and fewer problem behaviours (total = 1) post-recess compared to pre-recess (adaptive total = 12, problem total = 8) in the classroom. Given these behaviour patterns, it may be that the recess period had a positive impact on Hailey's subsequent classroom behaviours.

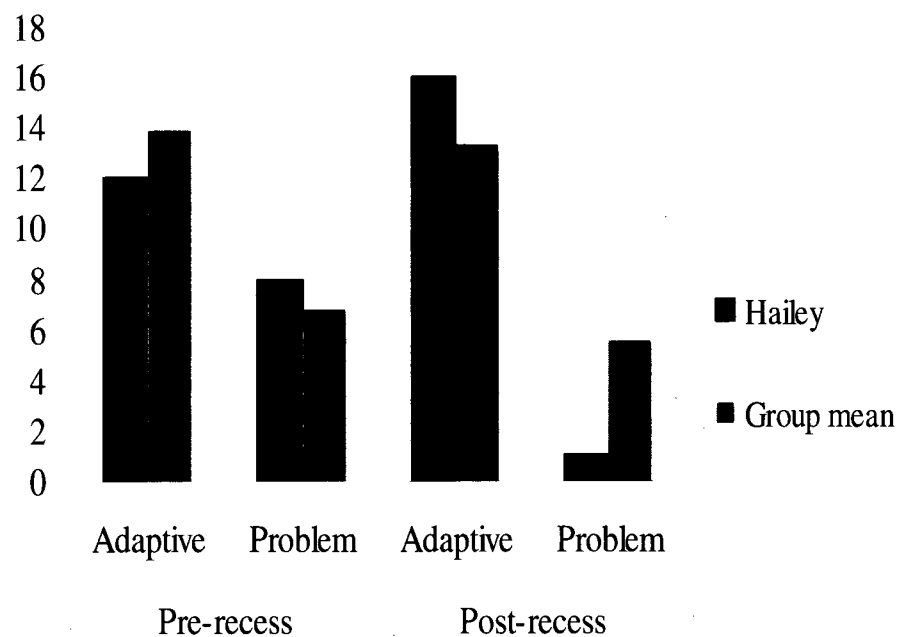
Upon comparing Hailey's frequencies of adaptive and problem behaviour to the sample averages, it is evident that she displayed fewer than the average number of adaptive behaviours, and greater than the average number of problem behaviours, pre-

recess in the classroom. In contrast, she displayed greater than the average frequency of adaptive behaviour, and fewer than the average frequency of problem behaviour post-recess in the classroom (see Figure 8).

Table 26

*Hailey: Frequency of adaptive and problem behaviour pre- and post-recess in the classroom*

Variable	Pre-Recess	Post-Recess
Adaptive behaviour	12	16
Problem behaviour	8	1



*Figure 8. Pre-recess and post-recess classroom observations: Hailey's adaptive and problem behaviour compared to the group means.*

**Comparisons of recess and Phys-Ed.** Moreover, as outlined in Table 27, more adaptive behaviours were observed during Phys-Ed (total = 17) compared to during

recess (total = 15); whereas a very few problem behaviours were observed during both physical activity periods. More specifically, no problem behaviour was observed during recess (total = 0), and only one instance was observed during Phys-Ed (total = 1).

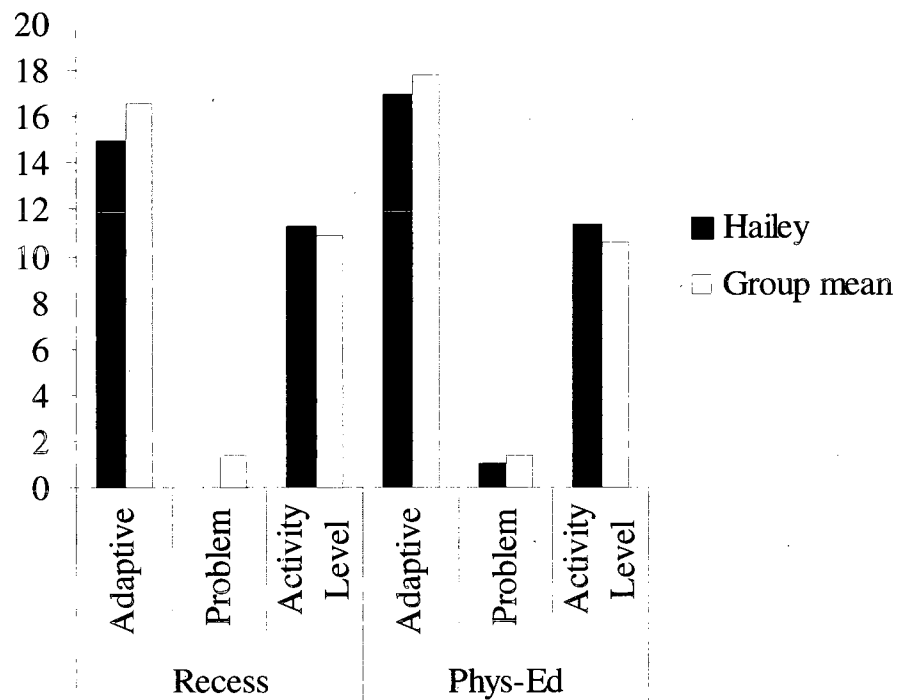
Although Hailey displayed a slightly greater frequency of adaptive behaviour during Phys-Ed, her general pattern of behaviour was relatively similar to the quantitative result of no differences between average scores of problem and adaptive behaviour across recess and Phys-Ed contexts. In terms of activity level, Hailey's overall intensity of activity during the recess period (total = 11.3), was very similar to her intensity of activity during Phys-Ed (total = 11.4). This is consistent with the finding of no differences between sample averages of overall activity during recess and Phys-Ed.

In comparison to the sample averages, Hailey's frequency of adaptive behaviour, and problem behaviour observed during both recess and Phys-Ed periods were slightly lower than the average frequencies of adaptive and problem behaviour. Her activity levels, on the other hand, were just above the average activity level for the research sample (see Figure 9).

Table 27

*Hailey: Frequency of Adaptive and Problem Behaviour during Recess and Phys-Ed*

Variable	Pre-Recess	Post-Recess
Adaptive behaviour	15	17
Problem behaviour	0	1
Composite activity level	11.3	11.4



*Figure 9.* Recess and Phys-Ed observations: Hailey's adaptive and problem behaviour compared to the group means.

***Comparisons of classroom and physical activity periods.*** Further comparisons of Hailey's behaviour can be made across classroom and physical activity contexts. Similar to the sample results obtained, she displayed more adaptive behaviours and fewer problem behaviours during recess (adaptive total = 15, problem total = 0) and Phys-Ed periods (adaptive total = 17, problem total = 1), compared to pre-recess in the classroom (adaptive total = 12, problem total = 8). Post-recess in the classroom, however, the frequency of adaptive (total = 16) and problem behaviour (total = 1) Hailey displayed is similar to the frequency she displayed during recess and Phys-Ed. This pattern of results is unlike the sample results obtained, which indicated more adaptive behaviours and



fewer problem behaviours during physical activity periods compared to both classroom periods (i.e., pre-recess and post-recess).

**Child perceptions of recess and Phys-Ed.** To aid the interpretation of the quantitative results previously outlined, Hailey was asked to describe her perceptions of recess and Phys-Ed, and to compare her behaviours across each context. In doing so, she provided responses that were, in some ways, similar and different to other participants. Like most children interviewed, she expressed enjoyment for the recess period, responding “yeah, it’s fun”. Further, when elaborating upon reasons for liking recess, she focused primarily on the freedom and opportunities for social interaction provided during this period. In particular, she noted, “In class, you’re not allowed to talk about anything. At recess, you can run around and talk and do anything-- a little freedom”. She then continued, “I like to hang out with friends, talking and playing games, [doing] silly things”.

As well, when asked to discuss negative perceptions of this period, she promptly responded, “I don’t like that it ends”, providing further indication of her enjoyment of recess. Aside from this, she only noted dissatisfaction with the lining-up policy at the end of recess. More specifically, she stated: “I don’t like to line up at the end. I feel like they’re treating us in Grade 6 like little kids. I don’t like being treated like a little kid”.

In relation to Phys-Ed, Hailey also discussed both likes and dislikes; however, her general interest and enjoyment of Phys-Ed seemed only moderate. For example, when asked if she likes Phys-Ed, she commented, “Yeah..but I find we do a lot of activities”. Further, when expressing her reasons for liking Phys-Ed, she mentioned both positive and

negative features. Describing her enjoyment for having a free choice of activities, she noted “I like Fridays – free play. Sometimes people make houses with mats and sometimes people come knock it down and it gets overheated and smells [inside the houses]”. Additionally, she expressed a liking for certain activities during Phys-Ed, but also dissatisfaction with the equipment provided. She commented “I like using scooters, and I wish people would give more money to the school for better equipment because they’re all gross and stink”.

When next asked about her reasons for disliking Phys-Ed, she highlighted a few additional aspects. Like several other children, she expressed negative views towards her participation in certain physical activities. Specifically, she mentioned “I don’t like running, [we] do a lot of laps”. Further, regarding a contextual feature of Phys-Ed, she noted, “Sometimes I wish we could go outdoors more—like, when all the snow is gone we could play a game of soccer..when it’s sunny”.

Finally, when comparing behaviour and social interactions during recess and Phys-Ed, Hailey perceived there to be similarities. Unlike many of the other participants, she did not identify any behavioural or contextual differences across contexts. Responding to the final interview question, she said “[I behave] pretty much the same. In Phys-Ed, even when I’m playing a sport we’re supposed to be doing, I talk with my friends and chill— except when I got hit in the face by Donnie. He asks like a child”.

**Summary and interpretations.** Like most other participants, Hailey described some positive and negative features of recess and Phys-Ed periods; however, she seemed to express particular enjoyment for recess. Moreover, when comparing her behaviour and

social interactions across recess and Phys-Ed periods, Hailey did not identify any perceived differences across contexts. This is also reflected in observational comparisons of her behaviour, which revealed no major differences in her frequency of adaptive and problem behaviour across physical activity settings.

Moreover, when observed in the school context, Hailey displayed more positive behaviour patterns (i.e., more adaptive and fewer problem behaviours) during recess and Phys-Ed, as well as post-recess in the classroom. In contrast, she displayed the fewest number of adaptive behaviours and a greatest frequency of problem behaviour when observed pre-recess in the classroom. Pre- and post-recess comparisons of Hailey's behaviour suggest that recess may have positive effects on her classroom behaviour throughout the school day. Despite this finding, it remains unclear as to whether Hailey's participation in more structured physical activity periods, like Phys-Ed, would have had similar effects on her subsequent classroom behaviours.

Overall, taking into account Hailey's social and emotional difficulties, her perceived enjoyment of recess, as well as the observed improvements in her behaviour following recess, her participation in this school period may be particularly valuable throughout the school day.

## **Discussion and Conclusions**

Overall, a main goal of this study was to investigate the effects of an intact school recess period on the subsequent classroom behaviours of elementary school children. Further, behavioural comparisons of children were made during school recess and Physical Education periods in order to explore the influence of unstructured versus structured physical activity contexts on behaviour.

### **Recess and Children's Subsequent Classroom Behaviour**

One of the primary questions of this study was to examine the influence of an unstructured recess period on the subsequent classroom behaviours of children. Based on previous research findings related to the developmental functions of recess for typically developing children (Jarrett et al., 1998; Pellegrini, & Davis, 1993; Pellegrini, et al., 1995), as well as for children with emotional and behavioural concerns (Jarrett et al., 1998; Rigway et al., 2003), all children were expected to display a greater number of adaptive behaviours, and fewer problem behaviours, while observed in the classroom subsequent to an unstructured recess period.

While previous research provides evidence for improved classroom behaviour and concentration among children following recess (Jarrett et al., 1998; Pellegrini, & Davis, 1993; Pellegrini, et al., 1995; Rigway, et al., 2003), the findings of the current study revealed no differences between students' average scores of problem and/or adaptive behaviours before and after recess. Although the reason for such research findings remains unclear at this time, it is possible that a different pattern of results may have been obtained had a design similar to those used in previous studies been employed. Unlike the

methods used by previous researchers to investigate the impact of recess on students' classroom behaviour (Jarrett et al., 1998; Pellegrini, & Davis, 1993; Pellegrini et al., 1995; Rigway et al., 2003), there was no manipulation of the school recess period within the current study (e.g., providing recess on alternating school days, varying recess timing, or recess duration). Instead, a naturalistic observation strategy was employed in order to evaluate the effects of intact school recess periods on children's subsequent classroom behaviour. As such, it is not known, for example, whether the frequency of problem behaviour in the classroom would have decreased, and whether adaptive behaviour would have increased, if the children's behaviours on days with recess were compared to their behaviours on days without recess.

As Pellegrini and Horvat (1995) have noted, many of the existing explanations for the function and benefits of recess throughout the school day can be derived from the concept of *mass versus distributed practice* (Munn, 1946). This is the idea that children's attention and behaviours are impacted by the grouping (i.e., massing) or distribution of task-related work across time. More specifically, it suggests that children display higher levels of concentration and less inattentive activity (e.g., fidgeting) when tasks are carried out in short, but frequent, intervals versus lengthier and infrequent intervals. Following these ideas, it may be expected that children, within the classroom context, become less attentive during longer periods of school work without any, or only infrequent, breaks (i.e., recesses). Although the current study documented no improvements in children's behaviour post-recess in the classroom, children's observed behaviours also did not tend to worsen. Further, this pattern of results was obtained for some children with higher

teacher- and self-reported levels of inattentiveness and hyperactivity, as was highlighted in the case study of Donnie. However, if the researchers of this study, for example, had systematically observed all children's behaviour on days with lengthier periods of school work and fewer recess breaks (as opposed to only observing before and after an intact recess period), it is possible that a negative impact on children's behaviour and level of concentration in the classroom would have been found.

In addition to these explanations, the pattern of results obtained may have been impacted by the nature of the classroom activities (e.g., gender preference seatwork) occurring pre-recess and post-recess in the classroom. Previous research has demonstrated, for example, that boys tend to be more attentive to male-preferred tasks (e.g. mathematics) over female-preferred seatwork (e.g., reading; Pellegrini, & Landers-Pott, 1996). Since the researcher made naturalistic observations within the school context, steps were not taken to control these variables within the current study.

### **Behaviour within Structured versus Unstructured Physical Activity Contexts**

A second goal of this study was to investigate how the behaviours and activity levels of children in unstructured physical activity contexts compare to those displayed in structured physical activity contexts. Given Litner and Ostiguy's (2000) contention that some children, such as those with ADHD, may derive benefits from participation in leisure settings that incorporate a higher degree of structure and consistency, the data was explored to reveal whether more adaptive and fewer problem behaviours were observed among children within structured, as opposed to unstructured, physical activity contexts.

Contrary to the expected result, the current study revealed no statistical differences between children's frequency of problem and adaptive behaviour during structured (i.e., Phys-Ed) and unstructured (i.e., recess) physical activity periods. There were also no differences between children's overall activity levels across physical activity contexts.

While there are positive implications associated with children's participation in structured as well as unstructured physical activity (Basile et al., 1995; National Association for Sport and Physical Education, 2001; Pellegrini, & Smith, 1998), very few studies have made comparisons of children's problem and adaptive behaviour across these contexts. However, using Bronfenbrenner's *Bioecological Systems* perspective (2005) as guiding framework, it may be expected that the complex interactions between children's internal systems (e.g., self-regulation), and the external characteristics of physical activity settings (i.e., degree of structure) may produce varied effects on children's behaviour. For example, given the behavioural inhibition and self-regulation difficulties of children with ADHD, physical activity settings which incorporate a higher degree of structure and consistency may have an enhanced effect on their behaviour (Litner, & Ostiguy, 2000).

In relation to the current study, it is possible that the behavioural characteristics of the sample, in general, provide one explanation for the finding of no statistical differences between children's behaviours within structured (i.e., Phys-Ed) and unstructured (i.e., Recess) physical activity contexts. Among the research sample, very few children were identified as having any major behavioural difficulties by school

personnel. The successful recruitment of children with and without EBD would have allowed for interesting comparisons of children's behaviour and activity levels while participating in recess and Phys-Ed.

**Integration of qualitative findings.** Although the quantitative observational data did not support the hypothesis that children would display more positive behaviour patterns within structured versus unstructured physical activity settings, an exploration of qualitative child data provided insights into children's own perspectives of recess and Phys-Ed, as well as their behaviour across these contexts.

Broadly, the children included within this study identified both positive and negative features of recess and Phys-Ed periods. This is consistent with previous research documenting children's experiences at break times (Blatchford, 1998). In particular, while speaking about recess, children of the current study expressed positive perceptions regarding opportunities to have fun and socialize, take a mental break from work, and release energy, away from the classroom context. In line with these views, previous investigations have found that 'schoolyard culture' is highly valued by children, in particular, because it provides them with unique opportunities to engage in playful activities throughout the school day without obtrusive supervision (Blatchford, 1998). Overall, recess provides children with the freedom to choose their activities and initiate friendships; however, there is also more freedom for conflicts to manifest (Blatchford, 1998). Reflecting this, children of the current study held negative perceptions of social/relational difficulties, such as bullying or fighting amongst peers, encountered on the playground. Additionally, other negative perceptions expressed by children included



adult-imposed rules or regulations (such as those related to safety or behaviour management), as well as boredom or dissatisfaction with schoolyard equipment.

When discussing Phys-Ed, on the other hand, many children expressed enjoyment for having a choice among activities. This theme is consistent with previous research, which found that adolescents' viewed 'activity choice' as a vehicle for enhanced student enjoyment and participation in Phys-Ed (Smith, Green, & Thurston, 2009). In addition to this feature, participants of the current study held positive perceptions of planned activities, the Phys-Ed teacher, opportunities to work with peers, learning or improving upon skills, and the fitness/health benefits associated with being active. They held negative perceptions, however, of social difficulties or other student's misbehaviour during Phys-Ed, and feeling tired, dirty, or sore throughout their participation in activities. As well, some children reported dissatisfaction with as being required to participate in certain activities. Likewise, Smith, Green, and Thurston, (2009) found that youth expressed a dislike for having restricted activity choice during Phys-Ed.

In addition to these viewpoints, the current study also highlighted that children perceived differences in their behaviour and social interactions across recess and Phys-Ed periods. For children, these differences were associated with the organization or structure of each context, as well as the supervision and space provided during recess and Phys-Ed. Some children, for example, described their own self-directed organization of activities during recess, and expressed enjoyment of the structure and planning of activities provided during Physical Education (e.g., Participants #6, #18). This finding is consistent with the qualitative work of Fitzgerald, Bunde-Brouste and Webster (2009) who also

found that elementary school children, when asked about their favourite activities or sports at school, tended to express greater interest in more structured games and teams sports. Additionally, several children suggested that they may engage in more covert, and at times, problematic (or “bad”) behaviours in the school yard because it is less confined and perhaps and less closely monitored than within the gymnasium, for example. Along similar lines, it has been previously noted that children may be more likely to hide or avoid engaging in negative behaviours in the presence of supervision, as they become more conscious of rules or expectations associated such behaviour (Pepler and Craig, 1995; Sluckin, 1981).

Moreover, although the quantitative results revealed no differences between children’s activity levels across recess and Phys-Ed periods, some children perceived variations in their activity levels across contexts; in particular, they felt as though they were more active during Phys-Ed than recess periods. Previous literature has documented a variety of factors which may influence children’s activity levels during recess (Sallis, et al., 2001; Stratton, & Mullan 2005; Willenberg, et al., 2010; Zask, Van Beurden, Barnett, Brooks, & Dietrich, 2001). Sallis and colleagues (2001), for example, found that providing children with greater accessibility to schoolyard equipment, and greater adult supervision, predicted higher levels of physical activity. A longer recess duration, and the presence of multi-coloured playground markings has also been linked to increased physical activity levels among children (Stratton, & Mullan 2005; Zask et al., 2001). Within the current study, observations occurred during a lengthier school recess period (lunch recess), and the schoolyard in which such observations took place included all of

the features noted above. Although there may be perceived differences among students, these factors may help explain the quantitative finding that children displayed similar activity levels during recess and Phys-Ed periods.

Finally, in line with the quantitative observational findings, some children of the current study perceived similarities between their behaviours and social interactions during recess and Phys-Ed. These perceived similarities were generally associated with opportunities to engage in comparable types of activities, and to socially interact with peers within both contexts.

### **Comparisons of Behaviour within Physical Activity and Classroom Contexts**

A third research question of this study examined how children's behaviours within physical activity contexts (recess and Phys-Ed) compare to their classroom behaviours. Previous research suggests that some children derive greater benefits from, or display less problematic behaviour within settings that provide structure, predictability and closer monitoring versus settings that provide less organization and supervision (Lewis, Colvin, & Sugai, 2000; Litner and Ostiguy, 2000). As such, the data was analyzed to explore whether more adaptive, and fewer problem behaviours, occurred within more highly structured and closely monitored classroom and physical activity (i.e., Phys-Ed) environments, in comparison to unstructured physical activity settings (i.e., Recess).

Unlike previous findings related to children's behaviour within more organized and structured environments (Lewis, Colvin, & Sugai, 2000; Litner and Ostiguy, 2000), it was found that students within the current study exhibited significantly fewer problem

behaviours and more adaptive behaviours during more structured as well as less structured school physical activity periods (i.e., recess and Physical Education), compared to classroom periods.

One explanation may be that the particular nature of the context itself, and the expectations of adults within such contexts, influenced the types of behaviours observed and recorded. Indeed, children's experience of physical activity periods, perhaps especially that of recess, may stand in stark contrast to the culture and climate of a classroom. In the classroom, for example, children are typically confronted with a range of academic activities and tasks that some may find boring and/or challenging. However, in physical activity contexts, children are provided with opportunities to select a range of activities they enjoy, such as games, team sports, and social interactions. At the same time, recess and Phys-Ed also allow for greater freedom of movement and energy expenditure. Given previous research findings that children display improved behaviour and are more attentive to preferred activities (Cooper, et al., 1992), it may not be surprising that children displayed more positive patterns of behaviour (i.e., less problem and more adaptive behaviours) within physical activity contexts.

Moreover, since recess and Phys-Ed may elicit fewer demands on children's concentration and/or limits of their behaviour, the observer (researcher) may have deemed fewer behaviours inappropriate within such contexts. As the descriptive results demonstrate (see Tables 2, 3, 5, and 6), when observed, children exhibited different patterns of problematic behaviours during recess and Phys-Ed, compared to classroom periods. Children, for example were more frequently observed displaying problem

behaviours such as inappropriate movement, inattention and repetitive motor movements in the classroom, as opposed to during recess or Phys-Ed. On the other hand, while some (although very limited) aggressive behaviour was noted during recess and Phys-Ed, no such behaviour was witnessed in the classroom. Additionally, children's greater degree of mobility within physical activity contexts may have provided the researcher with enhanced opportunities to observe adaptive behaviour, such as positive social interactions, among children.

In the current study very few problem behaviours, on average, were noted across physical activity contexts. Though bullying and aggression are often cited as problematic features of school recess periods (Pellegrini, 2004), some researchers have questioned how often true aggression occurs on school playgrounds (e.g., Pellegrini, 1989; Pepler & Craig, 1995). Currently, there appears to be some conflicting research on this topic. Using remote audiovisual observations, Pepler and Craig (1995), for example, concluded that schoolyard aggression is a frequent occurrence. More specifically, these researchers found that children, who were not previously identified as aggressive, displayed physical aggression once every 11 minutes, on average. Instances of physical aggression were even more frequent among children considered to be aggressive, and were observed once every 6.6 minutes, on average (Pepler, Craig, & Roberts, 1998). In contrast to these results, Pellegrini (1989) has previously reported very low rates of aggression during recess. In particular, it was found that aggressive acts accounted for only 0.3 % of children's behaviour in the schoolyard (Pellegrini, 1989). Overall, the findings of this current study are consistent with Pellegrini's (1989) research. A low occurrence of

observed aggression may be due, in part, to the supervision provided during recess and Phys-Ed. As Pellegrini (1989) highlights, lower rates of aggression may be partly attributed to teachers' discouragement of such behaviour. Additionally, aggressive behaviour may be repressed by a low social density (Pellegrini, 1989). During recess, for example, children within the current study played and interacted within a spacious playground environment, and as such, it may have been easier to avoid, or remove themselves, from situations that elicit aggression.

Alternatively, it could be that the findings of this current study were impacted by methodological difficulties associated with observing or interpreting behaviour within physical activity contexts. As children develop an enhanced awareness of behavioural expectations and/or rules, Pepler and Craig (1995) have noted that children's display of problematic behaviours may become more covert in the presence of an observer. Given that the current sample was comprised of primarily older elementary children (Grade 6), it may be that problematic behaviours were less visible to an observer in the school yard setting, whereas adaptive behaviours were more easily identified.

### **Behavioural Variations among Children across Classroom and Physical Activity Contexts**

In addition to the findings previously summarized, this study outlined two case studies of children presenting with distinct behavioural profiles based on the teacher and self-reported assessments (i.e., Donnie and Hailey). More specifically, the data collected for each child was reported in order to highlight individual differences in relation to the impact of physical activity contexts on behaviour.

With regard to the first research question of the study, comparisons of each child's pre-recess and post-recess frequencies of adaptive and problem behaviour highlighted different behavioural patterns. Although Donnie generally displayed fewer than the average number of adaptive behaviours, and greater than the average number of problem behaviors both pre- and post-recess in the classroom, his behavioural *pattern* was similar to that obtained through group analysis of the data. More specifically, an observer recorded only slightly fewer adaptive behaviours, and an equivalent number of problem behaviours, post-recess compared to pre-recess in the classroom. As such, no major differences between Donnie's pre- and post-recess behaviours were observed. For Hailey, on the other hand, the behaviour pattern observed was somewhat different to the results obtained through quantitative analysis. In particular, she displayed a slightly greater number of adaptive behaviour and fewer problem behaviours during the post-recess observation. In other words, Hailey displayed an enhanced behavioural pattern post-recess in the classroom. This pattern is consistent with previous research demonstrating improved levels of classroom attention and behaviour following the provision of a recess break (Barros, et al., 2009; Jarrett et al., 1998; Pellegrini, & Davis, 1993; Pellegrini, et al., 1995; Rigway, et al., 2003). Since Donnie and Hailey were only observed before and after recess on one occasion, however, it is not possible to draw conclusions as to whether or not these observations reflect relatively stable (pre- and post-recess) behaviour patterns. Despite this, they raise questions as to whether or not there are individual differences among children in relation to the impact of recess on subsequent classroom behaviour. Given these findings, it may be questioned, for

example, whether recess serves to enhance some children's concentration and behaviour, while at the same time, prevent the worsening or deterioration of other children's classroom attention and behaviour throughout the school day (as may have been the case for Donnie).

Comparisons of children's behaviour across classroom and physical activity contexts also reveal individual differences between the two children presented. For Donnie, more positive behaviour patterns were noted during recess and Phys-Ed compared to the classroom periods. For Hailey, on the other hand, enhanced behaviour patterns were noted only when her behaviours during recess and Phys-Ed were compared to her behaviours pre-recess in the classroom. Her positive behaviour pattern observed post-recess in the classroom, however, was similar to the patterns noted during recess and Phys-Ed. This may further highlight Hailey's improved classroom behaviours subsequent to the recess period.

In terms of each child's behaviours during structured versus unstructured physical activity periods (Research Question 2), the general behaviour patterns recorded were similar to the group results. More specifically, each child appeared to display a similar number of adaptive behaviours and problem behaviours during recess compared to Phys-Ed. In addition, during individual interviews with Donnie and Hailey, each child perceived very few behavioural differences when making comparisons across contexts. In particular, Hailey described her behaviour during recess and Phys-Ed as "pretty much the same". Although Donnie did not highlight any behavioural differences, he expressed a clear preference for Phys-Ed. In contrast, Hailey's interview responses seemed to reflect



a particular enjoyment of the recess period. It may be that children's perceived enjoyment of structured (i.e., Phys-Ed) and unstructured (i.e., recess) physical activity contexts differed in relation to their individual characteristics and needs. As Robertson (2000) notes, it is believed that human behaviour is largely motivated by individuals' social, psychological and physiological needs. Further, different forms of human activity, such as an individual's participation in certain leisure and recreational activities, may hold the potential satisfy such needs (Robertson, 2000). Moreover, from a bioecological standpoint (Bronfenbrenner, 2005), the interactions that occur between the individual features of children, and the features of the contexts in which they interact (i.e., structure, supervision, space), may produce unique effects on observed behaviour. Future research should make multiple observations and comparisons of children's behaviour across school contexts in order to further highlight and explore such individual differences.

### **Exploration of the Correspondence between Observer, Teacher, and Child Ratings of Behaviour**

Finally, an exploratory research question was also addressed within the current study. More specifically, the relationship between teacher ratings, child self-report ratings, and independent observer ratings of children's classroom behaviours was explored. This question was posed to investigate whether the observer ratings were consistent with teacher and/or child self-report ratings of behaviour, and to lend further support to the validity of the findings.

Broadly, it is believed that obtaining information from multiple perspectives or informants (such as parents, teachers, children, and observers) yields a more holistic

picture of children's overall social, emotional, and behavioural functioning (Edelbrock, Costello, Dulcan, Conover, & Kalas, 1986). However, previous research has found that there are often discrepancies between cross-informant ratings of behaviour (Achenbach, McConaughy, Howell, 1987; Duhig, Renk, Epstein, & Phares, 2000). One meta-analysis, for example, reported only modest informant agreement, on average. More specifically, correlations ranged from .28 to .60 depending on the type informants compared (e.g., parent and teacher ratings, or teacher and child ratings, etc.; Achenbach, et al., 1987).

Within the current study, it was found that observer ratings of children's problem and adaptive classroom behaviour were consistent with some categories of teacher-reported, and child self-reported behaviour. In particular, observer ratings of (pre- or post-recess) adaptive behaviour, were negatively associated with teacher ratings of internalizing problems, externalizing problems and school problems, and were positively associated with teacher ratings of personal adjustment. As well, observer ratings of post-recess adaptive behaviour, was negatively related to child self-reports of school problems.

Moreover, observer ratings of pre-recess problem behaviour were positively associated with teacher-reported externalizing problems, school problems, and behavioural symptoms, while it was negatively related to teacher-reported adaptive skills. In addition, positive associations were revealed amongst observer ratings of (pre- and/or post- recess) problem behaviour and child-reported school problems, as well as inattention/hyperactivity.

Although, generally, there was agreement between observer, teacher, and child ratings of behaviour, there were also some discrepancies (e.g., between observed scores of adaptive behaviour and child-rated personal adjustment). Previous research has explored both correlates and moderators of such discrepancies on child ratings of behaviour, including child, parent and family characteristics (De Los Reyes & Kazdin, 2005). Moreover, a variety of situational factors have been found to impact informant ratings of behaviour (Achenbach, et al., 1987). There is evidence that teacher ratings, for example, may be influenced by beliefs or attributions they may have of the intentionality and/or stability of certain problem behaviours (De Los Reyes & Kazdin, 2005; Lovejoy, 1996; Mills & Rubin, 1990). Teacher ratings may also be influenced by the reference group to which comparisons of each child are made; that is, teachers may compare children to others that they have had similar interactions with (Kerr, Lunkenheimer, Olson, 2007). Further, discrepancies between raters may be influenced by the contexts in which ratings are completed (e.g. Nolan & Gadow, 1994). Teacher and parent raters, for example, may have very different experiences with a child, given that they interact within distinct contexts (i.e., the school, and the home). Within the current study, discordance between observer ratings and teacher ratings, or teacher ratings and child ratings, could be attributed to some of these factors. Alternatively, it is possible that discrepancies between observer and teacher ratings of behaviour are related to the degree of exposure each rater had with the child; for example, while the observer rated each child only once pre-recess and post-recess in the classroom, the teacher assessment was based on impressions, observations, and interactions with the child in the school context over a

more extensive period of time. Moreover, discrepancies between observer ratings and child ratings of behaviour may not be surprising given that the behaviours recorded during single classroom observations (pre- and post-recess) may vary greatly from a child's own perceptions of his or her behaviour.

### **Limitations and Future Directions**

There are several limitations to this present study. One limiting factor of this research is its relatively small sample size. Although the sample recruited (N = 21) provided valuable descriptive information in relation to the primary areas of inquiry, a larger sample size may have allowed for the use more powerful statistical comparisons (e.g., ANOVA).

In addition, since all of the participants of this study were recruited from one elementary school, the external validity (or generalizability) of the findings across school contexts is somewhat limited. In particular, it can be noted that the pattern of results obtained may have been impacted by the teachers present within this school context. More specifically, observations of children's behaviour across school settings, as well as children's perceptions of recess and Phys-Ed periods, likely varied in relation to the participating teachers' unique characteristics, strategies, and interactions with students. As such, it remains unknown as to whether and/or how the pattern of results may have changed had children from other classrooms or schools been studied.

Another potential limitation of this research is that the children participating in the study were observed within each context on only one occasion, and for relatively short period of time (i.e., 15 minutes). Although this poses a potential limitation, it should be

noted that caution was taken by the researcher to ensure that observations of each child took place on typical school days. Having spent some time within the school context prior to commencing data collection, the researcher was somewhat familiar with the regular school routine and the typical behaviours of students. While making observations of each child, the researcher did not suspect that any child was displaying unusual behaviour on the day of the observation. Additionally, a limited number of observations in each context may have helped to minimize disruptions to the regular school routine. Although precautions were taken to ensure the validity of the observations, it would be beneficial for future research to include observations of target children over a longer period of time, and across several days.

Due to time restrictions, and the scope of this study, it should also be noted that no classroom observations were made immediately prior to, or following, children's participation in Phys-Ed. As such, no comparisons of the effects of structured versus unstructured physical activity on children's subsequent classroom behaviour could be made. Future research incorporating classroom observations before and after both structured and unstructured physical activity periods would be of value.

Further, the characteristics of children included in this study did not allow for appropriate behavioural comparisons of the children with and without EBD across contexts; however, two case studies of children with unique behavioural profiles were presented to explore and highlight any individual differences among students during classroom and physical activity periods. Future research should look more closely at individual differences among students in relation to the effects of recess on classroom

behaviour, as well as the role of structure within physical activity contexts. In particular, it may be beneficial to examine the behavioural processes (such as behavioural inhibition, and/or emotion regulation) that may influence or drive the effects of structured and unstructured physical activity on children's behaviour, and potentially account for any behavioural differences (if found) among students across structured and unstructured contexts.

Moreover, as previously indicated, the behavioural assessments of Grade 3 students were completed by the Phys-Ed teacher, whereas all assessments of Grade 6 students were completed by French and English homeroom teachers. Although the Phys-Ed teacher had useful insights into the behaviours of these students, this perspective may be different than that of the homeroom teachers, given that they interact with students in a more confined and highly structured classroom environment. This may, therefore, limit the interpretation of the correspondence between observer, teacher and student ratings of behaviour.

A further limitation of this study could be the use of a classroom observation protocol within non-classroom environments (i.e., the schoolyard and gymnasium). This observation tool was selected and used within both classroom and physical activity settings to facilitate straightforward comparisons of behaviour across contexts. However, since the protocol was designed, primarily, for the purpose of documenting children's adaptive and problem *classroom* behaviours, some behaviour categories included on the form were unlikely to be observed within physical activity contexts (e.g., inattention during recess). Moreover, some categories of behaviour, which were more likely to be

witnessed in the schoolyard or gymnasium, may have been excluded (e.g., leadership, bullying, solitary or onlooker behaviour, etc.). In some ways, this may have limited the descriptive information collected during recess and Phys-Ed periods.

In addition, some methodological difficulties were encountered while making observations of students' behaviour within the school context. Although the researcher had spent time with children (in classrooms, as well as during recess and Phys-Ed) prior to the onset of this project, some children may have acted differently with the presence an additional adult in the school context. Within more confined spaces like the classroom, the issue of child reactivity may be especially important to consider. Recognizing this as a potential limitation, the researcher attempted to remain relatively inconspicuous while observing within each school context. The researcher, for example, only entered the classroom at transition points throughout the day (i.e., immediately after morning recess, or at the onset of a new class period). In addition, classroom teachers provided feedback regarding an appropriate (or least distracting) place in the class from which to observe target students. Additionally, within the schoolyard and gymnasium, attempts were made to keep an appropriate amount of distance between the observer and the target child (i.e., not 'hovering'), while remaining in close enough proximity to accurately observe behaviour. Observations were completed in this manner so as to not leave the child with an impression that he or she was being watched.

Although such precautions were necessary, in some ways, they may have also limited the researcher's ability to capture certain details of, and perhaps appropriately interpret, children's behaviours. Moreover, given that the schoolyard is large, and at

times chaotic, the appropriate coding of behaviour in this context was particularly challenging. For example, while observing children at a distance, the researcher often had difficulty capturing potentially important details about the nature and tone of children's *verbal* interactions. This is important to consider given previous research findings which indicate that most aggressive initiations on the school playground are verbal in nature (Pepler, Craig & Roberts, 1998). Moreover, girls are more likely to display verbal aggression (and other indirect forms of aggression) than boys within such contexts (Bjorkqvist, 1994). In addition to children's verbal behaviour, it was also sometimes challenging to make a distinction between more physical forms of play (such as Rough and Tumble play) and physical aggression. Although Rough and Tumble play and aggression have several distinguishing features (e.g., tone, affect), some have noted that observers may easily confused these behaviours (e.g., fighting, chasing) due to their general structural similarities (Parke & Slaby, 1983; Pellegrini, 1987; Reed, 2005; Sluckin, 1981).

One way to address these methodological issues could be through the use of audio-visual recording techniques to capture students' behaviour. Researchers, such as Pepler and Craig (1995), have used remote audiovisual recording to effectively study children's social interactions and aggressive behaviours on the school playground (see also Smith & Lewis, 1985; Tapper, & Boulton, 2002). More specifically, this methodology involves the use of wireless microphones (attached to the target child) and remote video cameras in order to capture children's behaviour and interactions within naturalistic settings. Although there are some similar methodological limitations



associated with this technique (e.g., limited experimental control, child reactivity), it may be a useful observational method to employ in future studies of the effects structured versus unstructured physical activity settings on children's behaviour. According to Pepler and Craig (1995), the greatest strength of this observational methodology is its external validity— Children remain completely mobile within naturalistic contexts in which they are observed. As such, researchers are provided with a unique opportunity to obtain information that is not typically accessible to adults (Pepler & Craig, 1995).

Overall, in addressing some of the limitations highlighted above, this study could act as a good springboard for larger experimental research projects investigating the influence of structured versus unstructured physical activity contexts, and/or the impact of intact school recess periods, on children's behaviour. Alternatively, a greater emphasis on qualitative methods to describe children's behaviours across school contexts may be valuable to consider. Although the use of a, primarily, quantitative research design was an efficient way to address the main research questions and hypotheses of the current study, the observational data lacks some rich contextual details. A descriptive case study of four or five children with and without EBD, for example, could have allowed for more observational comparisons of children across contexts (e.g., during recess and Phys-Ed, or on days with and without recess, etc.), and may have provided rich contextual information. Moreover, this may be a more feasible avenue of research than a larger comparative study. A qualitative approach may also be useful in order to explore the perceptions of teachers and administrators, as well as students, in relation to children's behaviour following recess, and across physical activity contexts. This could

provide further insights in to the practical nature and overall relevancy of such topics within the school context.

### **Implications and Practical Applications**

While some potential limitations have been noted, there are several important implications of this research. Specifically, the findings are an extension of the literature on the developmental functions of recess during childhood and its implications within the school context (Barros, et al., 2009; Pellegrini, & Davis, 1993; Pellegrini, et al., 1995; Pellegrini & Smith, 1998; Jarrett et al., 1998; Rigway, et al., 2003). Moreover, this research bridges a gap in the literature in relation to children's behaviours within structured versus unstructured physical activity periods throughout the school day.

An important strength of this research may be the use of a naturalistic observation methodology, in combination with the gathering of qualitative data to obtain the child's perspective of recess and Phys-Ed. As Pepler and Craig (1995) suggest, naturalistic observation may be a more valuable approach to studying children's behaviour and social interactions, compared to a more highly controlled research study (e.g., a laboratory study). Since fewer constraints are placed on children during naturalistic observation, the results can be generalized to real-life situations with a greater degree of confidence (Pepler & Craig, 1995). Further, this study's inclusion of the child's perspective through qualitative interviewing contributes to our understanding of elementary students' unique experiences and perceptions of school physical activity periods. Together, these methodologies provide insights into children's display of adaptive and problem behaviours throughout the school day. In particular, the information gathered is of

practical value to school personnel who strive to create safe and enjoyable opportunities for children to be physically active within the school context. Positive observational findings in relation to children's behaviour during recess and Phys-Ed supports the encouragement of children's access to such contexts throughout the school day.

Over the last several years, the recess period has been an especially 'hot topic' for school personnel and developmental researchers. More specifically, such individuals have described both positive and negative features of recess. On one hand, some have highlighted that it provides children with a much needed break, and serves to enhance productivity within the classroom (Pellegrini, 2005). In addition, opportunities for children to develop important social skills (e.g., Waite-Stupainsky, & Findlay, 2001), and engage in physical activity have been noted (Sallis, et al., 2001; Zask et al., 2001). Negative views of this break period, on the other hand, have stemmed from an awareness of research demonstrating unacceptable behaviours on school playgrounds (e.g., bullying and aggression; Blatchford, & Sumpner, 1998). It has also been described, by some, as disruptive to valuable educational time (Smith, & Sharp, 1994 as cited in Blatchford, & Sumpner, 1998). Despite these contrasting viewpoints, almost every school currently incorporates at least one break period, or recess, throughout the school day (Blatchford, & Sumpner, 1998). The explicit school policies regarding such recess periods, however, vary across schools contexts and districts. For example, the number of recess periods, as well as the scheduling of these periods, and their duration, may vary greatly from one school to another (Blatchford, & Sumpner, 1998). As such, it is likely that children's experiences across school contexts also differ. With this in mind, the current research

project may provide valuable information for those responsible (e.g., principals, school board personnel, etc.) for developing and implementing recess policies within school contexts.

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**Appendix A**

**Copy of Concordia Ethics Approval Letter**

**Ethics Approval Letter**

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**Appendix B**  
**Teacher Information Letter**



Dear Teacher(s),

I am in my second year of the Masters in Child Study (Department of Education) at Concordia University. I am interested in understanding how children behave and socialize as they engage in physical activity throughout the school day (such as at recess, and during Phys- Ed). In addition, I am interested in learning more about of the role of recess within the school context; specifically, its effects on children's behaviour and their level of concentration within the classroom. This project will focus on children in grades 3 to 6 who may, or may not, be having difficulties in school.

A significant benefit of this study is to provide school personnel with practical information regarding the value of physical activity within the school context, and to, ultimately, identify practices that help children succeed in different school contexts, including classrooms and playgrounds.

Attached to this letter you will find a consent form, which outlines the details of your participation in this study. Please fill out the form and return it to the school office. If you indicate that you wish to take part in this study, I will then contact you and make an appointment to meet with you.

Thank you for your consideration. If you have any questions or concerns, please feel free to contact me, Lana Bergmame, at 514 848-2424 ext. 5691. You can also contact my supervisor, Dr. Hariclia (Harriet) Petrakos, at 514 848-2424 ext. 2013.

Sincerely,

Lana Bergmame (M.A. candidate)  
Project Researcher

**Appendix C**  
**Teacher Consent Form**



## CONSENT FORM TO PARTICIPATE IN RESEARCH

This is to state that I agree to participate in a program of research being conducted by Lana Bergmame (email: [lane\\_ber@education.concordia.ca](mailto:lane_ber@education.concordia.ca)) of the Department of Education at Concordia University for a Master's degree under the direction of Dr. Harriet Petrakos (telephone: 848-2424, ext. 2013; email: [hpetrakos@education.concordia.ca](mailto:hpetrakos@education.concordia.ca)).

### A. *PURPOSE*

I have been informed that the purpose of this research is to collect information about children's participation in physical activities within the school context; specifically, their behaviour during recess and Physical Education. Further, it will investigate the impact of children's behaviour during recess on their level on concentration within the classroom.

The information gathered for this project will build upon existing literature examining the developmental functions of school physical activity periods. Moreover, it will contribute to the current understanding of the effects of structured and unstructured physical activity, on children's behaviour within the school context.

### B. *PROCEDURES*

*I have been informed that the procedure is the following:*

The data collection will take place throughout the Fall/Winter of 2009. Parents will be asked to consent to their child being observed within the school context, as well as to him/her being taken out of class to meet with a researcher on one occasion. Once parents give consent to allow their child to be part of the study, the researcher will observe students within the school context on four occasions. In particular, they will be observed in



the classroom for approximately 15 minutes immediately before and after the lunchtime period, as well as during the lunchtime recess period. On a separate day, a 15-minute observation of each student will also be made as he/she participates in a Physical Education class. In addition, the researcher will meet with each child individually to talk about his/her behaviour and experiences at school with friends and teachers, as well as at home. The interviewer will learn about the student's behavioural strengths and weaknesses, and this meeting will take approximately 20 to 30 minutes to complete. Care will be taken to ensure that the children are not inconvenienced or disadvantaged by being taken out of class. If parents prefer, they may request that the meeting take place after school.

As the child's teacher, I will be asked to complete a questionnaire describing his/her behaviour and social interaction. Each questionnaire will take 10 to 15 minutes of my time in Fall/Winter 2009. I will receive compensation equivalent to a value of \$5 per child questionnaire for my participation and my time.

### **C. CONDITIONS OF PARTICIPATION**

- I understand that I am free to withdraw my consent and discontinue my participation at anytime without negative consequences.
- I understand that my participation in this study is **CONFIDENTIAL** (i.e., the researcher will know, but will not disclose my identity).
- I understand that the data from this study may be published.

I HAVE CAREFULLY STUDIED THE ABOVE AND UNDERSTAND THIS AGREEMENT. I FREELY CONSENT AND VOLUNTARILY AGREE TO PARTICIPATE IN THIS STUDY.

NAME (please print) \_\_\_\_\_

SIGNATURE \_\_\_\_\_

PHONE NUMBER (or E-MAIL) \_\_\_\_\_

SCHOOL NAME \_\_\_\_\_

*If at any time you have questions about your rights as a research participant, please contact Adela Reid, Research Ethics and Compliance Officer, Concordia University, at (514) 848-2424 ext.7481 or by email at [Adela.Reid@Concordia.ca](mailto:Adela.Reid@Concordia.ca).*

**Appendix D**

**Parent Information Letter**



Dear Parent(s)/Guardian(s),

I am in my second year of the Masters in Child Study (Department of Education) at Concordia University. I am interested in understanding how children behave and socialize as they engage in physical activity throughout the school day (such as at recess and during Phys-Ed). In addition, I am interested in learning more about the role of recess within the school context; specifically, its effects on children's behaviour and their level of concentration within the classroom. This project will focus on children in grades 3 to 6. Some children may behave appropriately and socialize well with other children, and other children may have some difficulties behaving and socializing. It is important to understand all children, regardless of their strengths and weaknesses.

A significant benefit of this study is to provide school personnel with practical information regarding the value of physical activity within the school context, and to, ultimately, identify practices that help children succeed in different school contexts, including classrooms and playgrounds.

Attached to this letter you will find a consent form, which outlines the details of your child's participation in this study. Please fill out the form and return it to your child's teacher. If you consent to your child taking part in this study, we will then arrange to meet with him or her individually throughout the school day.

Thank you for your consideration. If you have any questions or concerns, please feel free to contact me, Lana Bergmame, at 514-848-2424 ext. 5691. You can also contact my supervisor, Dr. Hariclia (Harriet) Petrakos, at 514- 848-2424 ext. 2013.

Sincerely,

Lana Bergmame (M.A. candidate)  
Project Researcher

**Appendix E**  
**Parent Consent Form**



## CONSENT FORM TO PARTICIPATE IN RESEARCH

This is to state that I agree to participate in a program of research being conducted by Lana Bergmame (email: [lane\\_ber@education.concordia.ca](mailto:lane_ber@education.concordia.ca)) of the Department of Education at Concordia University for a Master's degree under the direction of Dr. Harriet Petrakos (telephone: 848-2424, ext. 2013; email: [hpetrakos@education.concordia.ca](mailto:hpetrakos@education.concordia.ca)).

### A. PURPOSE

I have been informed that the purpose of this research is to collect information about children's participation in physical activities within the school context; specifically, their behaviour during recess and Physical Education. It will also investigate the impact of children's behaviour during recess on their level of concentration within the classroom.

The information gathered for this project will build upon existing literature examining the developmental functions of school physical activity periods. Moreover, it will contribute to the current understanding of the effects of structured and unstructured physical activity, on children's behaviour within the school context.

### B. PROCEDURES

*I have been informed that the procedure is the following:*

The data collection will take place throughout the Fall/Winter of 2009. A researcher will observe my child at school on four occasions. In particular, my child will be observed in his/her classroom for approximately 15 minutes immediately before, and after the lunchtime period, as well as during the lunchtime recess period. On a separate day, a 15-minute observation of my child will also be made as he/she participates in a Physical Education class. In addition to this meeting, my child will be taken out of class to meet, individually, with a research assistant. During this meeting, he/she will be asked to answer questions about his/her behaviour and experiences at school with friends and teachers, as well as at home. The interviewer will learn about my child's behavioural strengths and weaknesses, and this meeting will take approximately 20 to 30 minutes to complete. School personnel (e.g., teachers, resource, and/or consultants) will also be asked to complete a questionnaire describing my child's behaviour and social interactions.

### C. CONDITIONS OF PARTICIPATION

- I understand that I am free to withdraw my consent and discontinue my participation at anytime without negative consequences.
- I understand that my participation in this study is CONFIDENTIAL (i.e., the researcher will know, but will not disclose my identity). We will only share information with the parent if we suspect the child is unsafe and needs attention or if there is a recommendation for further assessment.
- I understand that the data from this study may be published, but only group findings will be reported. No identifying information will be included in publications.

I HAVE CAREFULLY STUDIED THE ABOVE AND UNDERSTAND THIS AGREEMENT.  
I FREELY CONSENT AND VOLUNTARILY AGREE TO PARTICIPATE IN THIS STUDY.

NAME (please print) \_\_\_\_\_

SIGNATURE \_\_\_\_\_

CHILD'S NAME \_\_\_\_\_

HOME TELEPHONE NUMBER \_\_\_\_\_

OTHER TELEPHONE NUMBER \_\_\_\_\_

TEACHER'S NAME \_\_\_\_\_

I DO NOT consent for my child to participate in this study.

*If at any time you have questions about your rights as a research participant, please contact Adela Reid, Research Ethics and Compliance Officer, Concordia University, at (514) 848-2424 ext. 7481 or by email at [AdelaReid@Concordia.ca](mailto:AdelaReid@Concordia.ca).*

**Appendix F**  
**Student Oral Consent Form**



## **STUDENT ORAL CONSENT FORM TO PARTICIPATE IN RESEARCH**

The research assistant will paraphrase the adult consent information in a manner consistent with the age of the child (age 9-12). For example, she/he will say:

“Your mom/dad has said that it is okay for you to meet with me. I am here to explain why we are meeting. You will meet with me and I will ask you questions about how you feel, and about how you think you are doing in school. You will be leaving your class to meet with me as long as it is also okay with your parents and your teacher. If you get tired you can take a break and then we can try again. You may decide to stop at any time. You do not have to answer any questions that you do not want to. Everything that you say is private and it will not be told to anyone unless I think that you are not safe and you need help. Then I will tell you if I have to tell an adult.”

“Do you have any questions?”

“Do you want to meet with me and talk about the things I told you about?”

## **Appendix G**

### **BASC-2 Teacher Rating Scale (TRS): Sample Questions**

**BASC-2 Teacher Rating Scale (Reynolds, & Kamphaus, 2004):  
Sample Questions**

**Instructions:**

The following items are phrases that describe how children may act. Please read each phrase, and mark the response that describes how this child has behaved recently (in the last several months).

Circle **N** if the behaviour **never** occurs

Circle **S** if the behaviour **sometimes** occurs

Circle **O** if the behaviour **often** occurs

Circle **A** if the behaviour **almost always** occurs

**Please mark every item.** If you don't know or are unsure of your response to an item, give your best estimate. A "Never" response does not mean that the child "never" engages in a behaviour, only that you have not observed the child to behave that way.

Sample Questions:

3. Responds appropriately when asked a question.....N S O A
24. Threatens to hurt others.....N S O A
57. Adjusts well to changes in routine.....N S O A
81. Worries about what other children think.....N S O A
106. Is clear when telling about personal experiences.....N S O A
132. Complains that lessons go too fast.....N S O A

## **Appendix H**

### **BASC-2 Self-Report of Personality: Sample Questions**

**BASC-2 Self-Report of Personality (SRP; Reynolds, & Kamphaus, 2004):  
Sample Questions**

**Directions:**

The following items contain sentences that tell how some boys and girls think or feel or act. Read each sentence carefully. For the first group of sentences, you will have two answer choices: **T** or **F**.

Circle **T** for **True** if you agree with a sentence  
Circle **F** for **False** if you do not agree with a sentence

For the second group of sentences, you will have four answer choices: **N**, **S**, **O**, and **A**.

Circle **N** if the behaviour **never** occurs  
Circle **S** if the behaviour **sometimes** occurs  
Circle **O** if the behaviour **often** occurs  
Circle **A** if the behaviour **almost always** occurs

Give the best answer for you for each sentence, even if it is hard to make up your mind. There are no right or wrong answers. Please do your best, tell the truth, and answer every sentence.

Sample Questions:

<b>Mark:</b>	<b>T- True</b>	<b>F- False</b>
--------------	----------------	-----------------

1. Things go wrong for me even when I try hard.....T F
23. If I have a problem, I can usually work it out.....T F
46. Nothing about me is right.....T F

<b>Mark:</b>	<b>N- Never</b>	<b>S- Sometimes</b>	<b>O- Often</b>	<b>A- Almost always</b>
--------------	-----------------	---------------------	-----------------	-------------------------

62. I like the way I look.....N S O A
79. I am lonely.....N S O A
108. I am someone you can count on.....N S O A
131. I have trouble paying attention to the teacher.....N S O A

## **Appendix I**

### **BASC-2 Student Observation System Including SOAL Items:**

#### **Sample Categories**







## **Appendix J**

### **SOS Time Sampling Recording Guide:**

#### **Definitions and Behaviour Examples**

### SOS Time Sampling Recording Guide: Definitions and Behaviour Examples

Category Definition	Behaviour examples
<p>1. <b>Response to teacher/lesson</b> describes the student's appropriate academic behaviours involving the teacher or class, but does not include solitary work on school subjects (see Category 3).</p>	<ul style="list-style-type: none"> <li>- Raising hand to ask, or answer a question</li> <li>- Contributing to class discussion</li> <li>- Engaging in conversation with the teacher, or waiting for teacher assistance</li> </ul>
<p>2. <b>Peer interaction</b> assesses positive, or appropriate, interactions with other students.</p>	<ul style="list-style-type: none"> <li>- Engaging in conversation with others</li> <li>- Encouraging another student by patting him or her on the back</li> <li>- Displaying cooperation, or partnership, by shaking hands with another student</li> </ul>
<p>3. <b>Work on school subjects</b> includes appropriate academic behaviours that the student engages in alone (i.e., without interacting with others).</p>	<ul style="list-style-type: none"> <li>- Working on a school subject either at the student's own desk, or at a learning centre</li> </ul>
<p>4. <b>Transition movement</b> describes appropriate and non-disruptive behaviours of children while moving from one activity or place to another.</p>	<ul style="list-style-type: none"> <li>- Walking in order to sharpen a pencil or retrieving an object</li> <li>- Lining up, following others in line</li> <li>- Taking a water or bathroom break</li> </ul>
<p>5. <b>Inappropriate movement</b> refers to inappropriate motor behaviours that are unrelated to classroom work</p>	<ul style="list-style-type: none"> <li>- Being asked to leave, or physically removed from a context</li> <li>- Hitting others with an object</li> <li>- Refusing to leave the teachers' side to participate in school activities</li> </ul>
<p>6. <b>Inattention</b> includes any non-disruptive inattentive behaviour.</p>	<ul style="list-style-type: none"> <li>- Scribbling at paper, or desks</li> <li>- Looking at objects unrelated to the activity</li> </ul>
<p>7. <b>Inappropriate vocalization</b></p>	<ul style="list-style-type: none"> <li>- Expressing harsh criticism of</li> </ul>

describes disruptive <i>vocal</i> behaviours.	<p>another</p> <ul style="list-style-type: none"> <li>- Teasing another student</li> <li>- Making disruptive noises (i.e., screaming, belching, or moaning)</li> </ul>
8. <b>Somatization</b> includes behaviours regardless of inferred reason (i.e., sleepiness due to medication, boredom, or poor achievement motivation)	<ul style="list-style-type: none"> <li>- Complaining of stomach pain, or headache</li> </ul>
9. <b>Repetitive motor movement</b> includes disruptive and non-disruptive behaviours that appear to have no external reward. Generally, behaviours of 15 seconds or longer should be checked.	<ul style="list-style-type: none"> <li>- Rapping fingers, or a pencil on desk</li> <li>- Tapping foot on floor</li> <li>- Moving body back and forth while seated</li> <li>- Hair- twisting</li> </ul>
10. <b>Aggression</b> refers to any harmful behaviour directed at another student, the teacher or property.	<ul style="list-style-type: none"> <li>- Intentionally tearing, ripping or breaking own or another's work, belongings or property</li> </ul>
11. <b>Self-injurious behaviour</b> describes severe behaviours that attempt to harm or injure one's self.	<ul style="list-style-type: none"> <li>- Banging head in wall, floor or object with enough force to bruise or injure</li> <li>- Attempting to ingest inappropriate substances (i.e., dirt, paper or grass)</li> <li>- Pulling at own hair with enough force to pull it out.</li> </ul>
12. <b>Inappropriate sexual behaviour</b> includes only behaviours that are explicitly sexual in nature.	<ul style="list-style-type: none"> <li>- 'Petting' self or others</li> </ul>
13. <b>Bowel/bladder problems</b> includes urination and defecation	<ul style="list-style-type: none"> <li>- Urinating, soiling or smearing in one's pants</li> </ul>

Referenced from: Reynolds, & Kamphaus (2004, p. 54)

## **Appendix K**

### **Scheme for Observing Activity Level (SOAL):**

#### **Category Definitions**

### Scheme for Observing Activity Level (SOAL): Category Definitions

Posture	Intensity	Description
1. Lying	Low	Lying motionless or with slight changes in position; includes stationary position on hands and knees
2. Lying	Medium	Lying with slow gross motor movements; slow crawling; rolling over; hanging by hands and knees from a structure; slowly pushing an object on hands and knees
3. Lying	High	Rapid crawling; wrestling on the ground; rapid pushing of an object on hands and knees; hanging over a swing and using feet
4. Sitting	Low	Sitting, kneeling, or squatting with fine motor movements only, or with slight changes in position on a chair, tricycle, or swing
5. Sitting	Medium	Clapping, rocking, reaching while seated; leisurely pedaling; sliding; swinging with some arm and leg movement; pushing or throwing an object while seated or kneeling
6. Sitting	High	Vigorous gross motor movements, such as waving arms or swinging legs while seated; rapid cycling, swinging while seated
7. Standing	Low	Stationary standing with only fine motor movement or minor shifts to maintain balance; bending; being passively held in an upright position
8. Standing	Medium	Walking; slow climbing or stairs; lifting moderately heavy objects while standing; standing on swing; throwing, pushing, or kicking without great effort; hanging motionless in upright position
9. Standing	High	Running or scrambling; throwing, kicking, or swinging with entire body involvement; rope climbing

*Referenced from: Eaton, Enns, & Pressé (1987, p. 275)*

**Appendix L**  
**Child Interview Protocol**

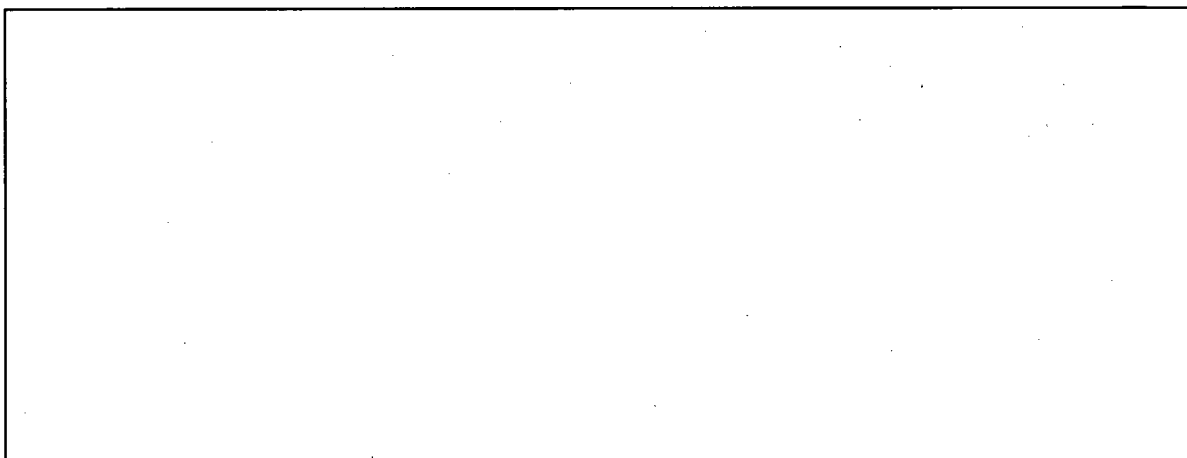
## Child Interview Protocol

**1. Do you like recess?**

**2. What do you like about recess?**

*Prompts:*

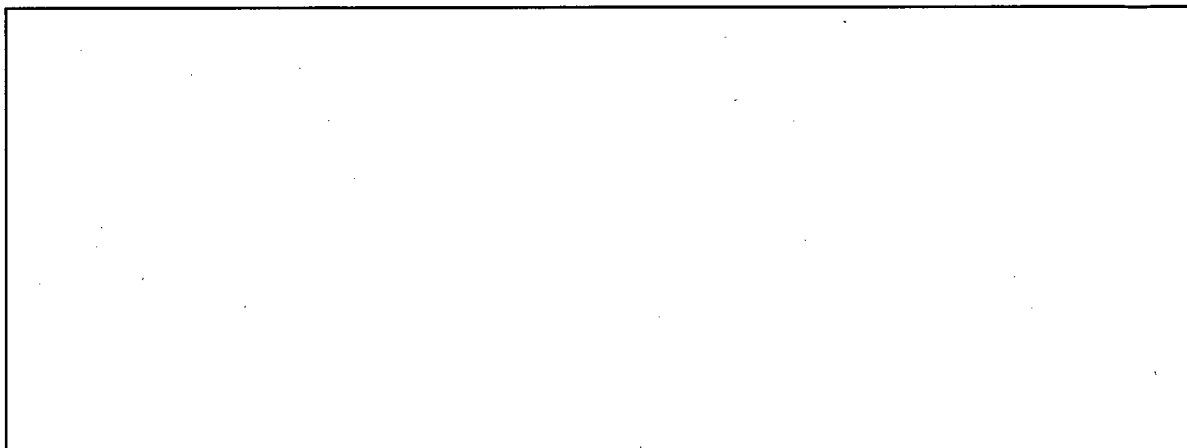
*What about the activities? What about the materials/equipment provided? What about the other students? What about the monitors?*



**3. What do you NOT like about recess?**

*Prompts:*

*What about the activities? What about the materials/equipment provided? What about the other students? What about the monitors?*

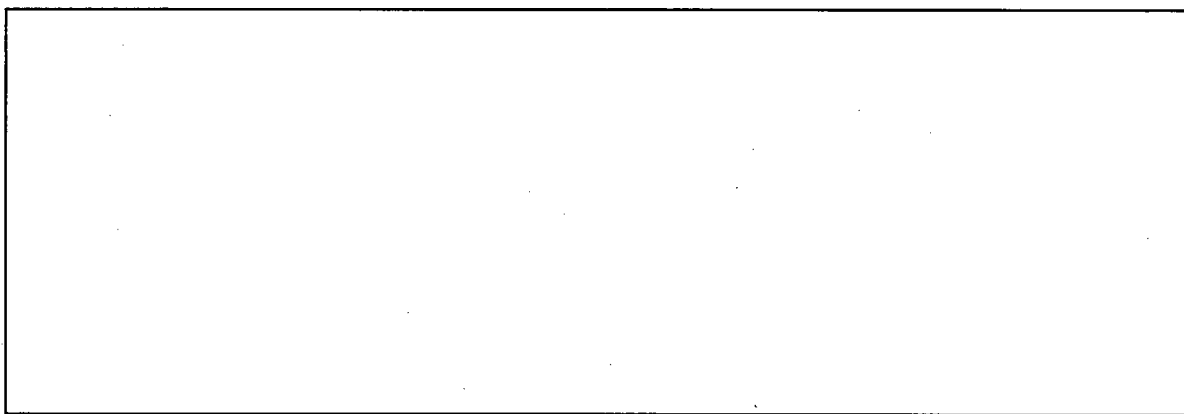


**4. Do you like Phys-Ed?**

**5. What do you like about Phys-Ed?**

*Prompts:*

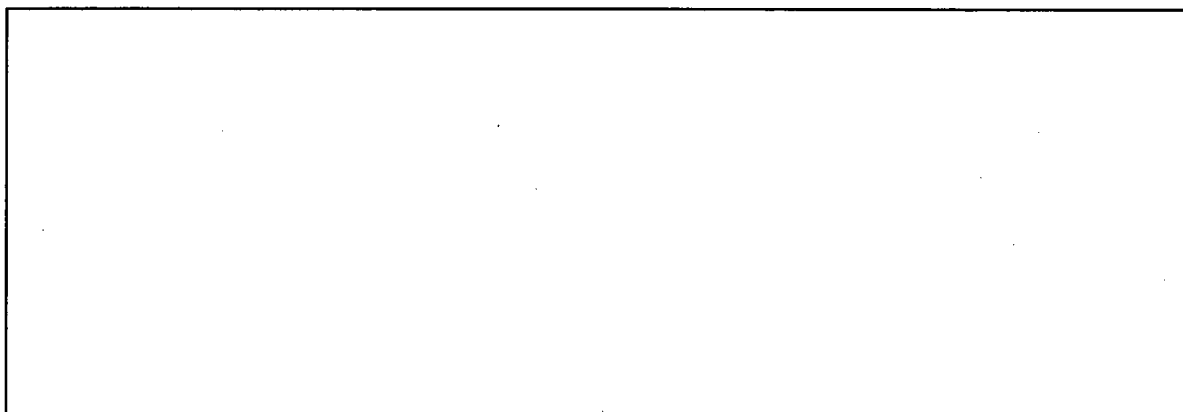
*What about the activities? What about the materials/equipment provided? What about the other students? What about the teachers?*



**6. What do you NOT like about Phys-Ed?**

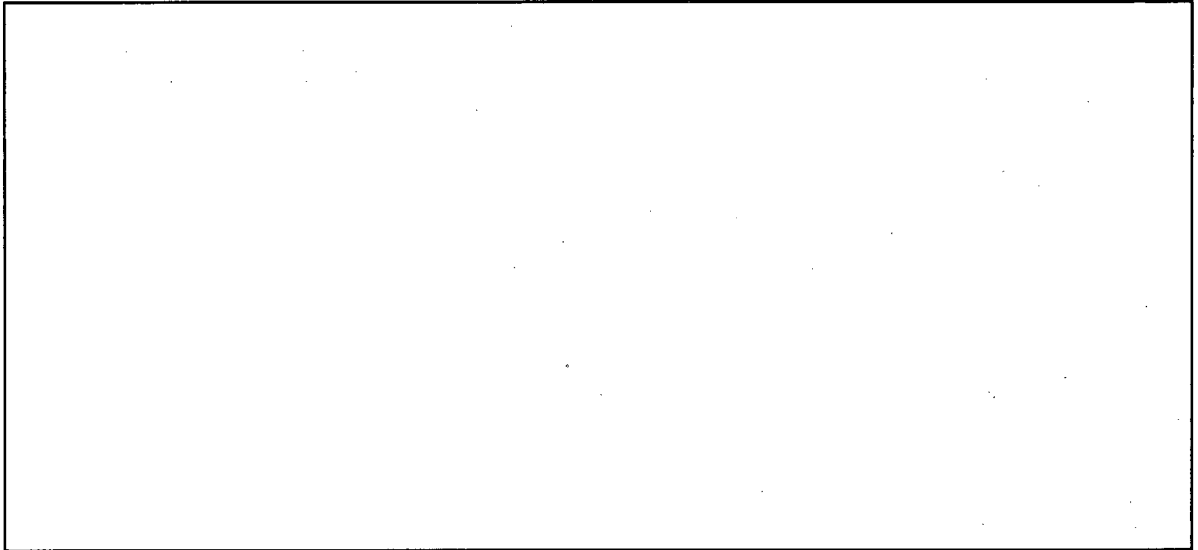
*Prompts:*

*What about the activities? What about the materials/equipment provided? What about the other students? What about the teachers?*





- 7. How is the way you behave and socialize with other students during recess similar or different to the way you behave and socialize during Phys-Ed?**

A large, empty rectangular box with a thin black border, intended for the student to write their response to question 7.