# Personal and Environmental Factors that Contribute to Experiences of Stress in Physical Education for Children at Risk for Developmental Coordination Disorder

by

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## Abstract

Psychological stress is as an experience that arises from a mismatch between a person's perception of a situation and his or her resources to cope with environmental demands (Aldwin, 2007). Developmental coordination disorder (DCD) is more than just a motor problem and is thought to cause many negative secondary consequences for children such as poor physical fitness (Rivilis et al., 2011), low self-esteem (Skinner & Piek, 2001), and social isolation (Smyth & Anderson, 2000), resulting in anxiety and depression (Missiuna & Campbell, 2014). Problems experienced in all developmental domains could greatly limit the skills and resources from which children can draw from to cope adaptively with stress. Many children with DCD seem to experience stress in physical activity contexts at school, particularly physical education, due to emphasis on their motor skills and their motor difficulties being visible to others (Fitzpatrick & Watkinson, 2003). However, researchers have not examined these experiences from the perspectives of children through a stress and coping lens or how teachers might contribute to experiences of stress. The first study explored how children who demonstrated characteristics associated with DCD, and were referred to as at risk for DCD, experienced and coped with stress in physical education. Interpretative phenomenological analysis (Smith, Flowers, & Larkin, 2009) was used to understand the essence of their lived experiences. Six children at risk for DCD who were 10 to 12 years old were recruited from elementary schools and summer camps at a physical activity centre. Children were asked to illustrate what a good and bad day in physical education was like for them, which they discussed during the first interview. A second interview was conducted to learn more about their bad day experiences. The audio-recorded interviews were transcribed verbatim and analyzed using Skinner and Wellborn's (1994) theory of stress and coping. The analysis revealed three themes: (a) they hurt me, (b) it's hard for me, and (c) I

have to. The children talked about experiences in which they sustained psychological and physical harm from peers, encountered difficulties in performing activities, and felt pressure to meet the teacher's demands. Children coped more adaptively in response to the first two stressors than third one. Social support, primarily from the teacher, seemed to influence how well children coped. While teachers can help guide children through stressful experiences to foster growth and resiliency, most are unfamiliar with DCD and its consequences (Wilson, Neil, Kamps, & Babcock, 2013) and lack adequate training to support these children (Jasmin, Tétreault, & Joly, 2014). Because perceptions can influence behaviour, the second study explored how elementary generalist teachers' understanding of DCD influenced their role in addressing the perceived needs of children thought to be at risk for DCD in physical education. Children were referred to as having movement difficulties (MD) since the term reflects functional and observable motor problems, and limited influence on teachers' perspectives. Interpretive description (Thorne, 2008) was used to gather practical insights from 12 teachers across all elementary years with diverse backgrounds. A single interview was conducted with each teacher to learn about perspectives of and experiences with these children, which was transcribed verbatim and thematically analyzed (Braun & Clarke, 2006). The analysis produced four themes; two representing teachers' perspectives and two their experiences: (a) "I think it can be different things," (b) "it encompasses a lot," (c) "I try to make it a positive experience," and (d) "I am like a jack of all trades, master of none." Teachers believed DCD was the consequence of an impairment and/or unhealthy lifestyle and recognized a range of difficulties children experienced. While these difficulties did not appear to be related to their perceptions of DCD, the concerns they had about children's normative development, beliefs about their physical education attainment, and views of who should support these children were. However, all

teachers thought their primary role was to ensure children had a positive experience by attempting to increase their physical competence. The collective results illustrate teachers require further education about these children and their experiences first hand to fully address their needs, as well as professional development that increases their abilities to assist children with developing personal skills and social resources to adapt well to adverse situations.

## Preface

This thesis is an original work by Chantelle Zimmer. Two research studies, part of this thesis, received ethics approval from the University of Alberta Research Ethics Board, "The experience of stress and coping in physical education for elementary school children with movement difficulties," No. 00068160, January 9, 2017; and "Understanding elementary teachers' perspectives of children with movement difficulties in physical education and how this informs their pedagogical practices," No. 00068198, January 5, 2017.

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# CHAPTER 1

## Introduction

Psychological stress is commonly viewed as an experience that arises from a mismatch between a person's perception of a situation and his or her resources to cope with environmental demands (Aldwin, 2007). It is a universal phenomenon experienced by individuals of all ages throughout the life course. What individuals experience as stressful and how they respond to stress differs based on biological factors, individual behaviours, and sociocultural influences (Aldwin, 2011). Traditionally, researchers were interested in how individuals coped with traumatic and major life events (Lazarus & Folkman, 1984). In fact, children were previously thought to only use coping responses and resources when non-normative major life events were encountered, such as occurrences of parental divorce, illness, bereavement, and medical treatments (Garmezy, 1983). More recent analysis of coping with common stressors, often referred to as daily hassles, has permitted the study of how children cope with everyday problems (Skinner & Wellborn, 1997, p. 388).

Researchers suggest the lives of children with developmental coordination disorder (DCD) are filled with daily problems and challenges as a result of their disorder (Cairney, 2015). These children experience substantial and persistent difficulties in the learning and performance of coordinated motor skills, which negatively impacts their participation in activities of daily living, academics, leisure, and play (American Psychiatric Association [APA], 2013). Although motor difficulties are the hallmark of DCD, it is more than just a motor problem and is thought to cause many negative secondary consequences, such as poor physical fitness (Li, Wu, Cairney, & Hsieh, 2011; Rivilis et al., 2011; Schott, Alof, Hultsch, & Meermann, 2007), low self-esteem (Skinner & Piek, 2001; Watson & Knott, 2006), social isolation (Smyth & Anderson, 2000), and symptoms of anxiety and depression (Missiuna & Campbell, 2014; Piek, Barrett, Smith, Rigoli, & Gasson, 2010; Pratt & Hill, 2011). Problems collectively experienced in the physical,

cognitive, emotional, and social domains of development could limit the skills and resources from which children with DCD can draw from to cope adaptively with stressful situations.

For more than a decade researchers have studied the impact of DCD on children's experiences at home, school, and in the community. While researchers continually alluded to certain coping responses children appeared to use to manage difficult or challenging situations in their day-to-day lives (Fitzpatrick & Watkinson, 2003; Missiuna, Moll, King, King, & Law, 2007; Segal, Mandich, Polatajko, & Cook, 2002; Zwicker, Suto, Harris, Vlasakova, & Missiuna, 2018), none examined these lived experiences from the perspectives of children through a stress and coping lens. Nor have researchers explored how significant adults in their lives might contribute to experiences of stress. The overarching purpose of this thesis research was to obtain an in-depth understanding of personal and environmental factors that contribute to experiences of psychological stress, and impact engagement in physical education, for children who demonstrate characteristics associated with DCD. Children are referred to as at risk for DCD because the label is commonly used in research to describe children thought to meet the diagnostic criteria for DCD but have yet to receive a diagnosis.

Physical education is part of the core curriculum in elementary schools. Physical and Health Education Canada (2018) recommends the curriculum area be taught by qualified professionals on a daily basis, throughout the entire school year, to contribute to the development of the whole child by fostering the knowledge, skills, and attitudes necessary to lead an active, healthy lifestyle. However, this is accomplished by the child engaging in various movement activities to learn *through* the physical, which places emphasis on his or her motor abilities and skills (Ennis, 2010). The motor difficulties of children at risk for DCD are often visible to teachers and peers in physical education and seem to result in children using coping responses,

like avoidance, to prevent their difficulties from being on display (Causgrove Dunn & Dunn, 2006; Fitzpatrick & Watkinson, 2003). These children need to be able to effectively manage daily hassles in this context; otherwise, accumulation of stress will adversely affect their functioning and well-being (Skinner & Wellborn, 1997). High levels of stress impair executive functions, such as self-regulatory processes, which make it difficult for children to control their emotions, thoughts, impulses, and behaviours, and may lead to mental health problems over time. While personal factors contribute to perceptions of stress and the use of particular coping responses, environmental factors that bring about problems and challenges for children, including curricular activities and interactions with teachers and peers, will be the focus of this thesis research. This is because teachers play an integral role in shaping children's experiences since they control the learning environment through planning and delivering lessons, cultivating the classroom climate, and monitoring learning and achievement (Sun & Chen, 2010). Teachers who create supportive conditions can foster greater engagement among children at risk for DCD and promote flourishing (Reeve, 2012).

## Overview of DCD

**Prevalence and terminology.** DCD is one of the most common neurodevelopmental disorders (Kwan, Cairney, Hay, & Faught, 2013) affecting 2 to 20% of school-aged children (Blank et al., 2019), though prevalence rates of 5 to 6% are typically reported in North America (APA, 2013). This translates to an average of one or two children in every elementary classroom (Missiuna, Rivard, & Pollock, 2004). The term *neurodevelopmental disorder* implies that the observable functional problems associated with DCD are the result of alterations in brain structure and function (Cairney, 2015). The term DCD was first introduced in the 3rd edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*; APA, 1987), and has been

revised and expanded on in the *DSM-IV* (APA, 1994) and *DSM-5* (APA, 2013). Children with significant motor difficulties were previously described under many labels: clumsy child syndrome, physical awkwardness, developmental dyspraxia, sensory integrative dysfunction, and minimal brain dysfunction, to name a few (Missiuna & Polatajko, 1995). The diverse labels were problematic for understanding and recognizing these children; therefore, a multidisciplinary group of experts were invited to an international consensus meeting on children and clumsiness in 1994. The experts addressed questions about the description, definition, assessment, and management of DCD (Polatajko, Fox, & Missiuna, 1995). They agreed to adopt the term DCD in research and practice, and advocated for greater consistency in the use of assessment tools to identify children with the disorder. While more consistent use of the term has strengthened our understanding of DCD, there still is no "gold standard" to accurately diagnose children.

**Diagnostic criteria.** Researchers and practitioners have made substantial progress in their understanding of DCD over the last two decades (Henderson & Geuze, 2015), which has resulted in revisions to the diagnostic criteria. Based on the most recent edition of the *DSM*, the following four criteria must be met for a diagnosis to be made (APA, 2013):

A. The acquisition and execution of coordinated motor skills is substantially below that expected given the child's chronological age and opportunity for skill learning and use. Difficulties are manifested as clumsiness (e.g., dropping or bumping into objects) as well as slowness and inaccuracy in the performance of motor skills (e.g., catching an object, using scissors or cutlery, handwriting, riding a bike, or participating in sports).
B. The motor skill deficits in Criterion A significantly and persistently interfere with activities of daily living appropriate for the child's chronological age (e.g., self-care and

self-maintenance) and impacts his or her academic productivity, prevocational and vocational activities, leisure, and play.

C. Onset of symptoms occurs in the early developmental period.

D. The motor skill deficits are not better explained by an intellectual developmental disorder or visual impairment and are not attributable to a neurological condition affecting movement (e.g., cerebral palsy, muscular dystrophy, degenerative disorder).

**Etiology.** The etiology of DCD is still idiopathic in nature, but there has been exponential growth in the number of research studies that aim to uncover its cause or set of causes. The motor difficulties of children with DCD are thought to be the result of atypical brain development (Dewey & Bernier, 2016; Gilger & Kaplan, 2001). Wilson and colleagues (2017) recently conducted a systematic review to better understand neural and performance factors that underlie their motor difficulties. Deficits were identified across different aspects of motor control (e.g., planning and anticipatory control), basic processes of motor learning (e.g., procedural learning), and cognitive control (e.g., executive functioning). However, performance was often moderated by task type and difficulty, meaning children seemed to use compensatory strategies under certain task conditions. Different patterns of neural activation found between children with and without DCD may partially account for some of the deficits (Brown-Lum & Zwicker, 2015). Brain imaging studies have shown that children with DCD require more attentional resources when first learning a motor task (Zwicker, Missiuna, Harris, & Boyd, 2010), with dysfunction between motor and sensory pathways potentially impacting initial stages of motor learning (Mariën, Wackenier, De Surgeloose, De Deyn, & Verhoeven, 2010; Zwicker, Missiuna, Harris, & Boyd, 2011). Difficulties in the acquisition and execution of motor skills to the point of automatization may be attributed to mild dysfunction of the cerebellum (Brown-Lum & Zwicker,

2015), which has been hypothesized to play a role in DCD since it develops later and slower than other brain regions (Ivry, 2003). Dewey and Bernier (2016) reviewed the increasing evidence that illustrates there are both structural and functional differences in particular brain regions of children with DCD compared to those without DCD. One particular study indicated specific genes and/or gene networks are involved in the development and function of neural circuits associated with DCD (Mosca et al., 2016). The results provide support for a genetic basis of the disorder, although, the authors note that other factors may contribute to atypical brain development in children with DCD such as movement experiences and poor nutrition. They recommend investigation into environmental etiological mechanisms (Dewey & Bernier, 2016).

To fully understand the etiology of a neurodevelopmental disorder, the process of development must be examined longitudinally among children thought to demonstrate characteristics associated with a diagnosis for a particular disorder (Henderson & Geuze, 2015). Few longitudinal studies have been conducted to date, but researchers have speculated that some children with DCD may be born preterm or have very low birth weight and come from families of low socioeconomic backgrounds (Lingam, Hunt, Golding, Jongmans, & Emond, 2009; Jongmans, Mercuri, Dubowitz, & Henderson, 1998). Some of the children in these studies, however, had neurological and visual impairments that might better explain the symptoms they developed. These biological and environmental factors seem to put children at risk for several disorders and may not be exclusive to DCD. What is known with greater certainty from longitudinal research is that many children do not outgrow their motor difficulties; they often persist well into adolescence and adulthood (Cantell, Smyth, & Ahonen, 1994; Geuze & Börger, 1993; Losse et al., 1991).

**Assessment in clinical and research settings.** Discrepancies in reported prevalence rates for DCD are believed to be due to the use of different assessments to screen for motor impairment and different cut-off scores used to determine the severity of the impairment. Children thought to have DCD are administered a standardized motor test because there is not a gold standard assessment to identify DCD with 100 percent certainty. Current standardized motor tests include a limited selection of motor skills and the functions of these tests often differ. Because the motor impairment of children with DCD is heterogeneous in both nature (fine and/or gross motor difficulties) and severity (mild, moderate, severe), administration of different tests and use of different cut-off scores will identify different groups of children (Schoemaker & Wilson, 2015). Researchers have frequently used the *Movement Assessment Battery for Children* (*MABC*-2; Henderson, Sugden, & Barnett, 2007) to confirm the inclusion of children in their studies. This standardized test is one of the diagnostic tools commonly used by healthcare professionals to identify and describe motor impairment among children and adolescents. It is the best motor test currently available to assess Criterion A for DCD because of its high identification accuracy and ability to incorporate professional judgement, such as other conditions that may be present in the child or possible reasons for poor task performance (e.g., anxiety, lack of motivation; Veldhuizen & Cairney, 2015). The 5$^{th}$ percentile is typically used for this test in clinical research to identify children with definite motor impairment, while the 16$^{th}$ percentile is often used in population and school-based research in an attempt to include the full spectrum of children with motor impairment.

A multidisciplinary team of healthcare experts is involved in the identification of children to ensure that all four diagnostic criteria are met before a definitive diagnosis of DCD is made. However, most researchers only necessitate children meet Criterion A to be eligible to participate

in their studies and have no other known medical conditions or neurological impairments based on parental reports or school records. Even though the *MABC*-2 is commonly used in both research and practice, it does not provide information about Criterion B, C, or D, and researchers typically have not used additional measures to assess these criteria. This is because no standardized tests have been developed to examine the effects of motor impairment on children's daily functioning, and current questionnaires lack ecological validity and comprehensiveness (Criterion B). The majority of questionnaires developed for screening children with DCD require parents and teachers to rate children on specific skills. Parents and teachers, however, may find it easier to complete a screening instrument about children's general aptitude for physical ability than specific motor skills (Veldhuizen & Cairney, 2015). Therefore, Criterion B is rarely assessed. For research with children, Criterion C is generally met if motor impairment is present. Although, this does not make it certain that the impairment is developmental rather than acquired. Furthermore, a pediatrician or psychologist is required to rule out medical and neurological explanations of the motor impairment (Criterion D). For research purposes, information obtained from children, parents, educators, and/or healthcare professionals is thought to be useful in identifying children who demonstrate characteristics associated with DCD beyond Criterion A.

**Assessment in school settings.** To facilitate screening of children with DCD in school environments, checklist-type questionnaires have been developed. These checklists enable teachers to assess the fine and gross motor skills of children in their class in order to identify those who require more individualized instruction, comprehensive testing, or referral for clinical services. Questions on the checklist are generally responded to using a likert scale to provide a measure of performance for everyday functional activities (Barnett, 2008). The assumption is that the teacher is familiar with the child and has had the opportunity to observe his or her typical

performance in different contexts such as the classroom and gymnasium. However, one of the main concerns raised about the use of these checklists is the ability of teachers to correctly identify true cases of DCD and children without DCD (Schoemaker & Wilson, 2015).

When teachers used checklists to identify children in their class, accuracy rates ranged between 14% (Junaid, Harris, Fulmer, & Carswell, 2000) and 85% (Faught et al., 2008). Some children were missed resulting in false negative cases (Junaid et al., 2000) while others were incorrectly identified resulting in false positive cases (Piek & Edwards, 1997; Schoemaker, Flapper, Reinders-Messelink, & de Kloet, 2008). Educational psychologists and teachers were found to provide the least accurate referrals to clinicians, with only 20% of the children referred actually meeting diagnostic criteria for DCD (Dunford, Street, O'Connell, Kelly, & Sibert, 2004). Misidentification of children is troublesome for physical and occupational therapy services because it creates longer wait times for children to receive diagnostic assessment (Dunford et al., 2004) and access to one-on-one services if warranted (Wehrmann, Chiu, Reid, & Sinclair, 2006). Limitations of the checklists, though, may be the reason for inaccurate screening and identification of these children.

Checklists are thought to be useful for teachers because they allow them to identify functional limitations across a variety of tasks and contexts (Green et al., 2005). Some teachers however may not be able to complete the entire checklist because of a lack of opportunities to observe particular motor skills across curricular tasks in the classroom and gymnasium. Children with DCD are also a heterogeneous group in that the motor impairment of one child may differ from another child (Missiuna, Rivard, & Bartlett, 2003). This further complicates the screening process because their motor impairment may not be fully captured by a single measure. The completion of multiple measures results in more accurate identification of children with DCD

(Missiuna & Pollock, 1995; Wright & Sugden, 1998), in addition to training for teachers around typical motor development and DCD (Kourtessis et al., 2008). Though, these are time consuming and costly alternatives likely not feasible in schools.

**Co-occurring disorders.** Current evidence suggests DCD is a distinct disorder in some cases and co-occurs with another disorder in other cases (Blank, Smits-Engelsman, Polatajko, & Wilson, 2012). DCD most commonly co-occurs with attention-deficit/hyperactivity disorder (ADHD), specific learning disorder (SLD), specific language impairment, autism spectrum disorders, and dyslexia (APA, 2013). The presence of symptoms associated with two or more disorders is termed comorbidity, but some DCD researchers (Kaplan, Dewey, Crawford, & Wilson, 2001) caution those who use the term because of the large overlap in symptoms amongst children with DCD, ADHD, and SLD. When a child displays symptoms associated with multiple distinct disorders, challenges arise in diagnosis and treatment, and questions are raised about the "independence" of such disorders (Gilger, Pennington, & DeFries, 1992).

Several researchers have reported that at least 50% of children with DCD demonstrate symptoms associated with ADHD (Kadesjö & Gillberg, 1998, 2001; Kaplan et al., 2001, Martin, Piek, Baynam, Levy, & Hay, 2010; Piek, Pitcher, & Hay, 1999), with comparable prevalence estimates for DCD and SLD (Iversen, Berg, Ellertsen, & Tønnessen, 2005; Kaplan et al., 2001). The presence of emotional and behavioural disorders have also been found among children with DCD (Green, Baird, & Sugden, 2006), in addition to difficulties with attention, learning (Lingam et al., 2010; Schoemaker, Lingam, Jongmans, van Heuvelen, & Emond, 2013), and psychosocial adjustment (Dewey, Kaplan, Crawford, & Wilson, 2002). While evidence from some brain imaging studies have shown there are shared neurological underpinnings of these neurodevelopmental disorders (Langevin MacMaster, Crawford, Lebel, & Dewey, 2014;

McLeod, Langevin, Goodyear, & Dewey, 2014), others have shown alterations in brain structure and function unique to these disorders (Langevin, MacMaster, & Dewey, 2015). At the current time, DCD is considered a separate disorder in some cases that requires different intervention (Goulardins et al., 2015).

**Intervention.** Interventions have been developed to address the motor impairment of children with DCD in order to increase their participation in a range of activities and contexts. Several systematic reviews have been conducted to examine the efficacy of these interventions (e.g., Hillier, 2007; Mandich, Polatajko, Macnab, & Miller, 2001; Pless & Carlsson, 2000; Smits-Engelsman et al., 2013; Wilson, 2005), which have been grouped into four categories: (a) task-oriented approaches, (b) process-oriented approaches, (c) traditional physical and occupational therapy approaches, and (d) drug therapy. Task-oriented approaches focus on the learning and performance of specific tasks commonly performed in daily life that are often chosen by the children because they have personal value to them (Sugden, 2007). Process-oriented interventions target underlying sensory motor processes such as balance, kinesthesia, proprioception, sensory integration, and visual-motor perception based on the assumption that improvements in these areas will lead to generalized improvements in skill performance across a range of activities (Barnhart, Davenport, Epps, & Nordquist, 2003). Traditional physical and occupational therapy generally combines aspects of task- and process-oriented intervention approaches (Smits-Engelsman et al., 2013). Fine and gross motor skills deemed important for children to acquire are developed in a hierarchical fashion, working first to improve basic abilities, followed by more specific and complex motor skills (Smits-Engelsman et al., 2013). Drug therapy is a relatively new approach that involves the use of specific medications to alleviate some of the adverse motor symptoms experienced by children with DCD. Task-oriented

and physical and occupational therapy approaches were found to lead to the greatest improvements in the movement performance of children with DCD.

**Ways of Thinking about and Approaching DCD**

The medical model of disability has largely been used to advance our understanding of DCD, as is evident in the overview. The medical model conceptualizes *disability* as an abnormal or problematic biological trait directly equated to diagnosis (Peers, Spencer-Cavaliere, & Eales, 2014). Over the last few decades, the focus of researchers and practitioners on medically defining significant and persistent motor difficulties observed in children resulted in DCD becoming a new medical condition. Through the process of medicalization, DCD was recognized as distinct from other neurodevelopmental disorders such as ADHD and SLD. This led to greater research on DCD in an attempt to understand its etiology and methods to identify children and manage their motor impairment. Because the "problem" is located within the individual, disability is viewed as a personal physical tragedy that should be overcome instead of accommodated (Haslett & Smith, 2019). Children with DCD, under this model, are considered dependent on experts to provide them intervention with the goal of achieving a socially constructed normative standard that is believed to be the "ideal" (Withers, 2012). Effective interventions are those that diminish or correct the problem within these children.

While neurological dysfunction is still thought to be the cause of DCD, researchers recognize that environmental factors can influence motor development as well (Cairney, 2015), which prompted changes to the diagnostic criteria in the *DSM-5*. The current criteria acknowledge that opportunities for children to learn and practice motor skills can effect their acquisition and execution of such skills (Criterion A) and performance of activities in different life contexts (Criterion B). The World Health Organization's (2001) International Classification

of Functioning, Disability, and Health Framework is now increasingly used in research to better understand DCD (Ferguson, Jelsma, Versfeld, & Smits-Engelsman, 2014; Saban & Kirby, 2018). The intent behind the framework is to provide a coherent view of human functioning by classifying it at three levels: the level of the body, the whole person, and the whole person in a social context. This framework, often referred to as the biopsychosocial model of disability, enables researchers to identify contextual factors that are barriers and facilitators for people's capacity of actions (body function and structure), performance of actions (activity), and tasks in daily life (participation). Contextual factors include both personal factors such as age, gender, and history of experiences, as well as environmental factors such as societal attitudes, social supports and relationships, and built environments. *Disability* exists when there is dysfunction at one or more of the three levels. It is an umbrella term that represents *impairment* (i.e., problem in body function or structure), *activity limitations* (i.e., difficulty encountered by a person in executing a task), and *participation restrictions* (i.e., problem experienced by a person's involvement in life situations). Although this framework is still grounded in a medical model of disability due to its focus on problems within the body, emphasis is placed on interventions that remove barriers hindering full and effective participation of people in society.

The biopsychosocial model of disability informed this thesis research because it allowed for exploration of personal and environmental factors that contributed to experiences of psychological stress in physical education for children at risk for DCD. By seeking knowledge about people and events in the social context (i.e., environmental factors) that impacted children's engagement, and led to appraisals of stress and efforts to cope (i.e., personal factors), I was able to make recommendations for practice to mitigate stressful experiences for children and increase their participation. Further, a transactional framework of stress and coping was chosen

to understand how children's perceptions of their own activity limitations were influenced by the social context. Green and Payne (2018) suggest children's perceptions may be more important in understanding their participation and well-being than the actual severity of their motor impairment. Person-first language, such as children at risk for DCD and children with impairments, is used throughout to be consistent with the model (Peers et al., 2014). This language recognizes that children are people first and their impairment is just one trait that does not fully define them.

## An Overview of this Thesis Research

**Research objectives.** This thesis is comprised of three papers – a narrative review and two qualitative studies. The purpose of the narrative review was to compare and contrast different theoretical perspectives on psychological stress and coping, with reference to the adapted physical activity literature concerning children with DCD. This review helped to establish which transactional framework was most appropriate for exploring personal and environmental factors that contributed to experiences of stress in physical education for children at risk for DCD. The objective of the two primary studies was to learn about these factors from multiple perspectives: those of the children and generalist teachers responsible for instructing physical education. More specifically, the first study aimed to explore the lived experiences of children at risk for DCD in physical education in order to develop a deeper understanding about what they experience as stress and how they cope with it. The purpose of the second study was to understand elementary generalist teachers' perspectives of and experiences with children thought to be at risk for DCD to determine areas where additional training is needed to support children's innate psychological needs, increase their engagement, and promote positive outcomes.

**Philosophical assumptions.** An interpretive research approach was used for the two primary studies. Interpretive qualitative researchers study things in their natural settings in order to attempt to understand the meanings people have constructed about their world and their experiences (Denzin & Lincoln, 1994), and are situated within the constructivist paradigm. A paradigm represents an overarching set of beliefs whereby "…researchers approach the world with a set of ideas, a framework (ontology) that specifies a set of questions (epistemology) that are then examined (methodology) in specific ways" (Denzin & Lincoln, 1994, p. 11). Constructivism adopts a relativist ontology where multiple, equally valid views of a phenomenon exist and are dependent on the context in which they are created (Ravenek & Rudman, 2013). Its subjective and transactional epistemology emphasizes that knowledge is always generated from and exists within a particular perspective, and people act in the world based on their subjective knowledge. Constructivist methodology has a commitment to dialectical and hermeneutic approaches (Guba & Lincoln, 1994). Knowledge in this paradigm consists of constructions, which are constantly compared and contrasted through dialectical interchange between the researcher and participants. Because the researcher's reconstructed understanding of the phenomenon is given meaning through dialectical engagement, the findings are created as the investigation proceeds (Guba & Lincoln, 1994). The researcher must be aware that he or she has a fore-structure to be hermeneutical and understand that dialectical engagement is needed to support a shared understanding with participants (Smith, 1991). The goal of such research is to obtain a more informed understanding of the phenomenon than was held at the outset.

**Positionality statement.** Positionality reflects where one is coming from and is essential to understand since the researcher's beliefs, values, and ambitions shape what he or she focuses on and the research process (Clancy, 2013). Particularly in qualitative research, in which the

researcher is the primary instrument for data collection and analysis, one has assumptions about the phenomenon being studied and research participants (Merriam et al., 2001). Acknowledging one's positionality requires reflexivity; the process of questioning attitudes, thoughts, reactions, and habitual actions to strive to understand one's involvement, effect on others, and limits of knowledge (Clancy, 2013, p. 13). Many factors should be considered in thinking about one's positionality such as age, gender, race, class, ability, education, profession, and past experiences. The extent to which these factors influence the research process though will depend on the specifics of the research.

I am a 31-year-old white, privileged female who is not diagnosed with a disorder. I have a multidisciplinary background in psychology and kinesiology, with research interests in child development, physical activity, health, and well-being. These interests developed earlier in my life through my involvement in academic and extra-curricular activities. I was a peer mentor for children with developmental impairments in different subject areas during elementary and high school, and outside of school time, was actively involved in sports as both a participant and coach. I have since spent most of my post-secondary education working with children with impairments through school-based research and physical activity programming. However, it was the experiences I had completing my master's research that motivated me to conduct this thesis research. I spent time in elementary physical education classes observing the movement performance of children to identify potential participants for my study (i.e., children at risk for DCD). During my observations, I noticed it was not uncommon for children thought to be at risk for DCD to get frustrated when practicing skills, withdraw from playing games, sit on the sidelines, and continually ask the teacher to get a drink of water or go to the washroom. I wondered if teachers noticed these behaviours and how they interpreted them, as well as

questioned why children behaved in these ways. Were these coping strategies? If so, what was causing the children stress? Through informal conversations with teachers I learned that some were aware of children who demonstrated these behaviours and perceived them to be disruptive, poor sports, and unable to listen to instructions. The negative perceptions some teachers had of these children seemed to be reflected in their actions toward them, such as intentionally targeting "disruptive" children in a game of dodgeball or dismissing the views of children who were "poor sports." Getting to know the children better through my research, and being familiar with the DCD literature, I recognized that how teachers perceived these children and behaved towards them may have contributed to experiences of stress and hence, the necessity for children to cope.

Prior to commencing my doctoral research, I had not been acquainted with the children and teachers who participated in my studies. I thought this might make it difficult to obtain in-depth understandings of their perceptions and experiences, in addition to my personal and professional dispositions. There is an inevitable power imbalance conducting research with children as an adult. Children may have viewed me as an authoritative figure; feeling they had to comply with my requests or thinking I would disclose anything "bad" they said to their principal or teacher. Although this may have influenced their comfort levels and what they chose to share, given my past experiences working with children with impairments, I thought they would open up to me about their experiences quickly. I had to carefully design research activities though that were both developmentally appropriate and allowed the children more freedom to discuss what they perceived as stressful in physical education. Before conducting the interviews, I expected that what I observed while conducting my master's research would be similar to what children shared. I had to challenge my assumptions about their abilities to participate in the research activities and eliminate bias stemming from my previous research experience. Critically

reflecting on my preconceptions prompted revisions to the research activities and affirmed that how I comprehend and experience stress as an educated adult without an impairment is different from the children in my study. I could not assume I knew the meaning behind their expressions and what these experiences were really like for them. This made it difficult as an "outsider" to ensure the children's voices were heard and their experiences were represented (Berger, 2015).

My position as a researcher may have created a power imbalance with the teachers as well, especially since I was in control of the research process. Given my level of education and professional background in adapted physical activity, some teachers may have considered me an expert in physical education. They may have felt uncomfortable discussing their pedagogical practices, thinking they were being evaluated, and chose not to disclose certain experiences that would make them appear unfavourably. Teachers who were older than me, male, or seasoned educators may have perceived themselves to be higher in status though (Merriam et al., 2001). On the other hand, some teachers may have viewed me as an "insider" who was part of the education community. I seemed to share language and a common professional base with some of the teachers that helped to build rapport. Throughout data collection and analysis, however, I tried to suspend assumptions I held from my master's research and acknowledge that even though I was knowledgeable about the problem being studied, I needed to be careful not to overlook important aspects of what was said (Clancy, 2013). I had to separate the practical insights provided by teachers from my own experiences to interpret them correctly. While the perspectives and experiences teachers shared would not be considered disparaging, I felt an obligation as someone the teachers trusted and who was responsible for submitting the results to the school districts to produce a report that represented their experiences in a positive light.

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# CHAPTER 2

## Perspectives on Psychological Stress and Coping: Understanding the Physical Activity Experiences of Children with Developmental Coordination Disorder

Children with developmental coordination disorder (DCD) experience significant difficulties in the acquisition and execution of coordinated motor skills that persistently impact their day-to-day functioning in different life contexts (American Psychiatric Association, 2013), resulting in daily hassles that may be perceived as stressful. Daily hassles refer to everyday experiences that are relatively minor compared to traumatic and major life events (Lazarus & Folkman, 1984). However, without intervention aimed at eliminating barriers that hinder their involvement in life situations, children with DCD may experience chronic stress and consequently mental health problems. There is increasing evidence that poor motor skills are associated with higher incidences of anxiety and depression in children and adolescents (Missiuna et al., 2014; Pearsall-Jones, Piek, Rigoli, Martin, & Levy, 2011; Piek, Barrett, Smith, Rigoli, & Gasson, 2010; Piek, Bradbury, Elsley, & Tate, 2008; Piek et al., 2007; Pratt & Hill, 2011; Skinner & Piek, 2001). Cairney, Rigoli, and Piek (2013) have suggested DCD may be a primary source of stress that exposes children to secondary stressors like low self-esteem, social support, and poor academic performance that then give rise to internalizing problems. Researchers are trying to uncover the psychosocial variables that contribute to and explain this relationship (Mancini, Rigoli, Cairney, Roberts, & Piek, 2016; Mancini, Rigoli, Roberts, & Piek, 2019). Obtaining greater understanding of daily hassles in contexts that children with DCD may perceive as stressful, and how they cope with these stressors, is one approach to inform intervention. This review of selected literature highlights perspectives of stress and coping that offer insight into the physical activity experiences of children with DCD and may advance research in the field of adapted physical activity.[1]

[1] *Adapted physical activity* is a cross-disciplinary body of practical and theoretical knowledge directed toward impairments, activity limitations, and participation restrictions in physical activity (International Federation of Adapted Physical Activity, 2019).

Psychological stress is commonly viewed as an experience that arises from the interaction between a person and the environment, particularly when there is a mismatch between the person's perception of a transaction and his or her resources to cope with external demands (Aldwin, 2007). In Western culture, athletic competence is an attribute that is highly valued (Vannatta, Gartstein, Zeller, & Noll, 2009). Children with DCD may be vulnerable in physical activity contexts where individuals involved share this value, especially mandatory contexts like physical education, because of their motor difficulties. When children with DCD are confronted with a difficult motor task, they must appraise the situation and draw on their personal skills and/or social resources to cope. If these children believe they do not possess the abilities to accomplish the task successfully (Batey et al., 2014; Cairney et al., 2005; Engel-Yeger & Kasis, 2010) and/or do not receive appropriate support from a peer or teacher (Thompson, Bouffard, Watkinson, & Causgrove Dunn, 1994), they may experience movement failure. Recurring experiences of failure can impact their self-esteem and self-determined motivation to improve their motor skills if they are unable to cope effectively. Children with DCD may begin to devalue athletic competence and avoid participation in both physical education and physical activities outside of school such as recreation and sport (Bouffard, Watkinson, Thompson, Causgrove Dunn, & Romanow, 1996; Cairney, Hay, Faught, Corna, & Flouris, 2006; Jarus, Lourie-Gelberg, Engel-Yeger, & Bart, 2011; Watkinson et al., 2001). This series of events can exacerbate their primary (motor difficulties) and existing secondary (psychosocial consequences) stressors, as well as result in new secondary stressors over time, leading to mental health problems. This example depicts the transactional perspective that is currently dominant in the stress and coping literature (Aldwin, 2007, 2011).

## A Transactional Perspective of Stress and Coping

The transactionist viewpoint is premised on the belief that individuals do not experience stress merely as a result of an environmental stressor (e.g., being confronted with a difficult motor task) since many variables contribute to (e.g., culture that values athletic competence, DCD diagnosis, social support [informational feedback, adaptations], self-determined motivation) and mediate (e.g., self-perceptions, self-concept, social skills; Rigoli, Piek, & Kane, 2012; Viholainen, Aro, Purtsi, Tolvanen, & Cantell, 2014; Wilson, Piek, & Kane, 2013) the relationship between people and the environment (Lazarus & Folkman, 1984). It is the combination of these variables that generate stress and influence its outcomes. This perspective emphasizes the dynamic, mutually reciprocal, bidirectional relationship between the person and the environment, meaning biological, psychological, and sociocultural systems are linked and influence one another (Aldwin, 2007).

A transactional theory affords the opportunity to study developmental processes involved in coping with stress because the focus of an encounter is *change* (Aldwin, 2007). Simply put, coping refers to what people do in the face of stress and demonstrates their active role in the transactional process. This is reflected in the standard transactional view of coping defined by Lazarus and Folkman (1984) as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p. 141). Currently, there is not an established framework of stress and coping over the lifespan that considers the kinds of stressors people of different ages are exposed to, how and why ways of coping change with age, and the short- and long-term outcomes of coping on development (Skinner & Zimmer-Gembeck, 2016; Zimmer-Gembeck & Skinner, 2011). A developmental framework is essential though given that stress is experienced at every age and

individuals must cope with it. Perspectives based on research with adults, which are not explicitly developmental, are often applied to children and adolescents with the most widely used theory being Lazarus and Folkman (1984).

Lazarus and Folkman's (1984) theory serves as a foundation for more recent approaches to the study of stress and coping, in part because of its emphasis on individual differences. "What is stressful for one individual at one point in time may not be stressful for another individual or the same individual at another point in time" (Aldwin, 2007, p. 32). Central to this theory is cognitive appraisal; a subjective, evaluative process that consists of primary and secondary appraisals of a transaction or series of transactions between the person and environment (Lazarus & Folkman, 1984). Primary stress appraisals involve recognition of harm/loss, threat, or challenge in encounters that have significance to people and may potentially compromise their commitments (e.g., values, choices, motivations, goals) and beliefs (e.g., perceived control over the situation). Harm/loss refers to transactions in which damage to the self has already taken place, threat is harm or loss that has not occurred but is anticipated, and challenge refers to transactions where gain or growth is possible. Secondary appraisals are used to determine what might and can be done about the stressful situation, taking into account available resources (e.g., personal – self-esteem, competence; environmental – social supports) and the likelihood of employing a particular strategy or set of strategies effectively (Lazarus & Folkman, 1984; see Figure 2-1). The nature, certainty, and temporal properties of the stressor generally influence how and to what extent people appraise an event as a threat or challenge.

While the transactional perspective has guided research on coping in childhood for the last few decades and still dominates the literature, Skinner and Zimmer-Gembeck (2016) argue that a developmentally friendly conceptualization is needed. Individuals *adapt* what they do in

different contexts to take into account personal and social factors and environmental demands. Coping is therefore an *adaptive process* of dealing with difficult situations. A definition of coping is required that reflects its roots as an adaptive process and emphasizes the reciprocal relationship between coping and development (Skinner & Zimmer-Gembeck, 2016). Such a framework would address how coping is shaped by individual differences, past experiences, current development, and ongoing normative developmental changes, as well as how processes through which people adapt to stress cumulatively shape development.

## A Developmentally Friendly Perspective

Learning about psychological stress experienced by populations that are arguably confronted with more obstacles to overcome, such as people with impairments, is valuable for providing accommodations and designing interventions. The obstacles they face may be attributed to the activity limitations imposed by their impairments and participation restrictions due to environmental barriers such as societal attitudes, social structures, social supports, and built environments (World Health Organization, 2001). Understanding these experiences in childhood would be most beneficial as growth and resiliency can occur from adapting well to adverse situations (Zimmer-Gembeck & Skinner, 2016). A perspective that outlines developmental processes that contribute to shifts in coping can help researchers better understand possible effects of stress on children with impairments, including those with DCD, and how ongoing encounters with the environment might shape their future development (Skinner & Zimmer-Gembeck, 2007).

There has long been debate in the literature about how to conceptualize coping, even with regards to perspectives that have greater application to childhood and adolescence. Compas, Connor-Smith, Saltzman, Thomsen, and Wadsworth (2001) for example view coping as

"conscious volitional efforts to regulate emotion, cognition, behavior, physiology, and the environment in response to stressful events or circumstances" (p. 89). Skinner and Wellborn (1994), on the other hand, define coping as "how people regulate their own behavior, emotion, and motivational orientation under conditions of psychological distress" (p. 112). Despite different conceptualizations, developmental researchers have increasingly converged on the notion of coping as "regulation under stress" (Compas, Connor, Osowiecki, & Welch, 1997; Eisenberg, Fabes, & Guthrie 1997; Skinner & Wellborn, 1994; Skinner & Zimmer-Gembeck, 2007). Moreover, definitions now acknowledge the role of multiple developmental processes and how these regulatory subsystems work together to produce coping (Skinner & Zimmer-Gembeck, 2007).

> Because problems and demands are distressing, coping often requires the regulation of *emotion*. Because stress can trigger biological reactions, coping can involve the regulation of *physiology*. Because coping requires the monitoring and detection of threats, it can involve the regulation of *attention*. Because coping describes what people do (or fail to do) when faced with challenging events, it can entail the regulation of *behaviour*. Because stress typically involves obstacles that interfere with goals and commitments, coping can require the regulation of *motivation*. Finally, because difficulties can activate appraisals and thoughts, coping can involve the regulation of *cognition*. (Skinner & Zimmer-Gembeck, 2016, p. 13)

Although some headway has been made towards definitions of coping that represent adaptive processes, disagreement still exists in defining core constructs. Researchers must agree on how people actually respond to specific difficulties they are confronted with in real-life contexts (Skinner & Zimmer-Gembeck, 2007). Coping responses are executed to address

particular environmental demands and are shaped by the resources available to people within the context the transaction occurs. This means there is an infinite amount of coping responses people could use. Broad categories such as problem- versus emotion-focused coping (Lazarus & Folkman, 1984) and engagement versus disengagement (Roth & Cohen, 1986) are typically used in research to organize coping responses that serve the same adaptive function (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001; Skinner & Zimmer-Gembeck, 2007; Zimmer-Gembeck & Skinner, 2011).

Problem-focused coping involves efforts directed at managing personal and environmental demands, while emotion-focused coping is aimed at lessening emotional distress (Lazarus & Folkman, 1984). Engagement coping reflects responses oriented towards the source of stress, whereas disengagement coping responses are oriented away (Compas et al., 2001). While these categories appear to be mutually exclusive, they are not (Skinner, Edge, Altman, & Sherwood, 2003); withdrawing from a stressful situation may serve the problem-focused goal of taking time to generate alternative solutions and the emotion-focused goal of calming oneself down (Compas et al., 2001). This makes the adaptive function of these categories unclear and therefore difficult to discriminate between coping responses at times (Ayers, Sandler, West, & Roosa, 1996; Connor-Smith, Compas, Wadsworth, Thomsen, & Saltzman, 2000; Lazarus, 1996). Furthermore, the overly broad categories result in the classification of many ways of coping but yet, the categories are not exhaustive due to the small number of functions they serve. Hundreds of coping responses have been identified using these organizing frameworks (Skinner et al., 2003) with little consistency in their application across measures and studies, which limits our understanding of the structure of coping in childhood and adolescence (Compas et al., 2001).

Skinner, Edge, Altman, and Sherwood (2003) reviewed the literature from the early

1980s to 2000s to organize ways of coping through the development of higher and lower order categories. This hierarchal model would allow researchers to determine the adaptive functions served by higher order categories and how those functions are fulfilled by different coping responses at different ages (Skinner & Zimmer-Gembeck, 2007). Although theoretical and empirical approaches differed, 12 broad categories were developed that classified most, if not all, the ways of coping identified in previous research (refer to Table 2-1). These higher order categories are emotional regulation (self-reliance), support seeking, delegation, social withdrawal (isolation), problem solving, information seeking, helplessness, escape, distraction (accommodation), negotiation, rumination (submission), and opposition. Of these categories, it appears children and adolescents largely use coping responses in only four – support seeking, problem solving, escape, and distraction (Skinner & Zimmer-Gembeck, 2007).

In their review on the development of coping, Zimmer-Gembeck and Skinner (2011) note that most studies to date have focused on how children and adolescents cope with specific stressors at particular ages, with few researchers investigating age differences and changes in coping within and across developmental periods. Empirical evidence thus far illustrates changes in coping processes during the following age periods: (a) birth to 18 months; (b) ages 2 to 5; (c) ages 6 to 8; (d) ages 10 to 12; (e) ages 14 to 16; and (f) ages 18 to 22 (Skinner & Zimmer-Gembeck, 2007, 2009, 2016; Zimmer-Gembeck & Skinner, 2011). These periods reflect changes in cognitive and emotional development, regulatory capacities, and the social environments children and adolescents interact with. Underlying developmental processes that produce age-graded shifts in coping responses are most evident from infancy to adolescence (Aldwin, 2011; Skinner & Zimmer-Gembeck, 2009). During these periods, social partners play an especially important role. They influence the stressors children and adolescents are exposed to, including

their own problems that might become stressors for them, and have greater involvement in the coping process (Skinner & Zimmer-Gembeck, 2016). Stressors that pose a threat to infants are biological needs such as being cold, uncomfortable, hungry, tired, or in pain. Infants' reactions to these stressors primarily consist of reflexes. Caregivers often intervene when crying occurs to calm or soothe the baby. Ways of coping shift from involuntary reactions to voluntary responses during early childhood due to development of the frontal lobe and executive functioning (Skinner & Zimmer-Gembeck, 2009). This allows toddlers to have a greater repertoire of coping responses and resources than infants (Aldwin, 2011). Before the age of three, toddlers assume that others know how they feel and what they want. However, children begin to distinguish their own emotions, desires, and beliefs from those of others with age (Skinner & Zimmer-Gembeck, 2016). The development of language allows children to directly communicate what is on their mind and seek support from others. Increased motor skills also enable them to manipulate the physical environment and escape from stressors. The primary role of caregivers is to help children cope more independently by guiding their actions to meet their own needs.

During middle childhood, children are able to make better sense of stressful encounters because they possess a deeper understanding of their causes (Skinner & Zimmer-Gembeck, 2016). Internalized morals such as *fair* and *right* influence their motivation to obtain short-term needs and desires. They are able to employ actions more intentionally and flexibly to address environmental demands and therefore, begin to recognize that certain coping responses work better in some situations than others. Their developmental capacities allow them to use a wider range of coping responses, particularly cognitive ones, to manage both their emotions and interpersonal problems. With the support of caregivers, teachers, and other important adults, children can develop pragmatic and constructive self-system processes (Skinner & Zimmer-

Gembeck, 2016). These processes are significant in how children appraise and deal with future stressors. Children with histories of adaptive coping episodes should perceive most stressors as challenges rather than threats as they enter into late childhood. Though, the start of adolescence can be marked by more problems with adaptive coping due to internal changes that heighten reactions to stress and exposure to new stressors, especially interpersonal ones (Silvers et al., 2012). Fortunately, during this period, regulatory subsystems become more integrated and executive functions are strengthened, which allow for even greater flexibility and sophistication in responses. For example, adolescents develop capacities to reflect on, evaluate, and refine their own coping and can enact proactive coping to manage future problems. The role of adults is to help adolescents balance demands and serve as a backup support when requested. Peers typically become the primary social support system during this period.

## A Motivational Perspective

Though many children with DCD experience similar secondary psychosocial consequences as a result of their motor impairment, differences likely exist because of factors at play in the various environments in which they interact. Taken together, individual children with DCD may cope differently and experience the effects of stress to different degrees in different contexts. A developmental framework would enable researchers to understand when and why certain coping responses might be considered adaptive and their effects long-term. Unfortunately, researchers are still working to establish this framework. However, Skinner and Wellborn's (1994) theory incorporates many of the fundamental elements of a developmental approach outlined above and will therefore be discussed with reference to the DCD literature. Their motivational perspective draws on self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2017) and centers around three basic psychological needs: (1) relatedness; the need to form close

relationships with other people and feel a sense of belonging, (2) competence; the need to be effective in interactions with the environment, and (3) autonomy; the need to freely determine one's own course of action. Skinner and Wellborn (1994) believe using a motivational needs theory to understand the process of stress and coping adds value to the field because of its strong assumptions about innate and universal human commitments.

Self-determination theory is one of the most commonly used theories in research that aims to understand children's engagement in physical education because its major components – relatedness, competence, and autonomy - are highly relevant in this context (Sun, Li, & Shen, 2017). However, few researchers have applied this theory to adapted physical education (Johnson et al., 2018; Pan, Tsai, Chu, & Hsieh, 2011; Tsalavoutas & Reid, 2006), despite its potential promise. In the *Handbook on Adapted Physical Education*, Causgrove Dunn and Zimmer (2019) review the research over the last decade on different facets of physical education concerning children with impairments through a self-determination theory lens. The authors conclude by recommending greater use of the theory in future research, which is echoed by other researchers. Katartzi and Vlachopoulos (2011) believe self-determination theory would enable us to better understand and increase the participation of children with DCD in physical education since their engagement is impacted by teacher behaviours. The theory emphasizes social contextual factors that support or thwart children's fulfillment of their three basic psychological needs and is suited for environmental interventions.

**Basic Psychological Needs**

Physical education may be stressful for children with DCD because external events are appraised as threats or challenges to their innate psychological needs (Skinner & Wellborn, 1997). Children's appraisals of a context are referred to as self-system processes, which are

constructed based on their history of interactions with the environment and shaped by developmental processes that help them interpret these interactions. The extent to which the environment is perceived to support or thwart their needs will influence the outcome of the transaction and its effects. Satisfaction of the three needs has been found to promote positive functioning and well-being among children, whereas frustration results in poorer functioning and ill-being (Reeve, Deci, & Ryan, 2004).

Events in the social context that facilitate experiences of relatedness, competence, and autonomy include involvement, structure, and autonomy support respectively. Involvement refers to expressions of affection and care. Teachers who display behaviours that are perceived to be warm, enthusiastic, and friendly (Connell & Wellborn, 1991; Skinner & Wellborn, 1994), as well as facilitate the development of peer relationships through opportunities for interaction and cooperation (Sparks, Dimmock, Whipp, Lonsdale, & Jackson, 2015) can fulfill children's need for relatedness. Structure is the provision of information about ways to interact with the environment that lead to maximal outcomes (Skinner & Wellborn, 1994). This construct involves the teacher communicating clear expectations for behaviour, organizing developmentally appropriate activities, providing optimal challenges, giving feedback and asking questions, and offering assistance when warranted (Reeve et al., 2004). Teachers who create classroom climates where individual effort and learning is emphasized and evaluation is based on self-referenced criteria (Ames, 1992) can support the need for competence. Structure may be essential for children with DCD because their motor difficulties can hinder their self-determined motivation to participate in physical education. Motor skill interventions that teach children with DCD a problem solving strategy to work through difficult motor tasks are effective in helping children meet their goals (Martini & Polatajko, 1998; Miller, Polatajko, Missiuna, Mandich, & Macnab,

2001; Sangster Jokić, Polatajko, & Whitebread, 2013; Zwicker et al., 2015). If children with DCD routinely execute this coping strategy in specific situations to overcome performance difficulties, it is no longer a coping response but a management skill (Aldwin & Brustrom, 1997). Teachers can further encourage children's active engagement through autonomy supportive behaviours such as allowing time for children to work independently in their own way, praising them when they demonstrate improvement or mastery, offering words of encouragement to sustain their engagement, providing suggestions when they are not making progress, and acknowledging their perspectives (Reeve & Jang, 2006). Children with DCD may view many activities in physical education unfavourably. In order to prevent or mitigate this outcome, it is critical that teachers nurture children's inner motivational resources by incorporating their interests, preferences, and goals into activities and explaining the purpose and benefits of uninteresting activities so they internalize the value of physical education.

From a motivational perspective, environmental stressors are events that threaten or challenge the three basic psychological needs because they oppose the social contextual factors that nurture them. This means neglect, chaos, and coercion are sources of stress (Skinner & Wellborn, 1994). Neglect is a lack of involvement from important others like teachers and peers; they may be physically or emotionally unavailable, be perceived as cold or distant, or actively reject and hate others. Cases of neglect are exemplified in research conducted with children with DCD and their parents, ranging from teacher frustration directed towards students with DCD (Barnett, Dawes, & Wilmut, 2013) to children being made fun of (Missiuna, Moll, Law, King, & King, 2006), excluded from activities (Segal, Mandich, Polatajko, & Cook, 2002), and victimized by peers at school (Bejerot, Plenty, Humble, & Humble, 2013; Campbell, Missiuna, & Vaillancourt, 2012; Stephenson & Chesson, 2008). Chaos refers to physical education classes

that are arbitrary, unpredictable, inconsistent, and unfair in that expectations set by teachers are unclear, activities are not fully explained and exceed children's abilities, strategies for achieving outcomes are not well specified, and opportunities to practice are insufficient (Skinner & Wellborn, 1994). Chaotic contexts are largely associated with children's perceived lack of control over a situation (Skinner & Zimmer-Gembeck, 2011). Children with DCD may appraise transactions in physical education as stressful if the classroom climate is teacher-directed instead of child-centred. Contexts that constrain, manipulate, or control the way children behave through competition, comparison, rewards, or punishment are considered coercive (Skinner & Wellborn, 1994). Examples from the literature demonstrate children's need for autonomy being undermined by teachers through punishment. In a study by Missiuna, Moll, King, King, and Law (2007), parents expressed concern about their child being sent out to the hall, kept in at recess, and verbally criticized by their teacher for not performing at an expected level.

**Ways of Coping**

Skinner and Wellborn (1994) conceptualize regulation as "how people mobilize, guide, manage, energize, and direct their behavior, emotion, and orientation, or how they fail to do so" (p. 113). Children's responses to environmental stressors are aimed at managing their engagement or disaffection with the stressful transaction through active or passive behaviour (e.g., initiation, effort, persistence versus avoidance, passivity, giving up), positive or negative emotions (e.g., enthusiasm, happiness, curiosity versus boredom, anger, anxiety), and orientation towards or away from the event (e.g., commitment to versus alienation from the goals of developing the three basic psychological needs; Skinner & Wellborn, 1994).

Based on this definition, the ways in which children respond to stress can be viewed as a continuum with under and over regulation on opposite ends and flexible regulation in the middle

(Skinner & Wellborn, 1994). Under regulation refers to uncoordinated action of the subsystems and may include impulsive behaviour, emotional outbursts, and a non-goal-directed orientation. Children with DCD sometimes have difficulty with appropriate behavioural and emotional responses (Green, Baird, & Sugden, 2006) and display more aggression during play than their same aged peers (Kennedy-Behr, Rodger, & Mickan, 2013a), including unprovoked hitting, grabbing, and kicking (Kennedy-Behr, Rodger, & Mickan, 2013b). It is plausible that some children with DCD demonstrate maladaptive coping responses due to under regulation; although, the underlying reasons for their behaviours and emotions warrant further attention. In contrast, over regulation occurs due to rigid behaviours, suppressed emotions, and perseverance at an outcome, which are unresponsive to personal and environmental demands. When behaviour is active and intentional, emotion is channeled, and orientation is goal-directed, the subsystems are coordinated and flexible regulation occurs (Skinner & Wellborn, 1994). Because flexible regulation involves effortful control processes that can be modified if necessary, it usually produces an adaptive response in a given context (Eisenberg, Valiente, & Sulik, 2009). However, both under and over regulation seem to be associated with involuntary or reactive control processes that are less flexible and typically result in maladaptive responses.

The 12 broad categories of coping (Skinner et al., 2003) previously discussed in this review have been organized using a hierarchal framework, where higher order categories reflect the multifunctionality of their associated lower order categories or coping responses. The coping responses are intended to regulate the self or context in response to a wide range of stressors appraised as threats or challenges in order to address children's concerns about relatedness, competence, and autonomy (refer to Figure 2-2). Generally speaking, threat responses are behaviourally active or passive, emotionally negative, and oriented towards the event, whereas

challenge responses are behaviourally active, emotionally positive, and oriented towards the event (Skinner & Wellborn, 1994). Responses to loss reflect helplessness and despair. They are behaviourally passive, emotionally negative, and oriented away from the event. If harm has taken place, it is always combined with threat because it has negative consequences for the future (Lazarus & Folkman, 1984).

Researchers who conducted interviews with children with DCD about their daily struggles found that children expressed the strongest negative feelings about school sports and social activities in comparison to self-care and school writing activities. One participant said, "…When we're playing at kickball I usually don't do well, I just like quit on it" (Zwicker, Suto, Harris, Vlasakova, & Missiuna, 2018, p. 5). Another child described a negative interaction he had with a peer. "…When I'm playing out on the field with my friends and they come up and push me around, and I push them back and because they're making me really mad and I, sometimes I can't control my madness" (Zwicker et al., 2018, p. 6). It seems from these quotes that children appraise stressful encounters as threats to their needs for competence, autonomy, and relatedness. In the first quote, escaping the game allowed the child to disengage from the stressor. However, functions served by maladaptive coping responses can also be served by adaptive coping responses (Skinner & Zimmer-Gembeck, 2016). Depending on the circumstances, which one needs to know to determine whether responses are maladaptive or adaptive, the child could have alternatively escaped from the game temporarily to come up with solutions or seek information from a peer or teacher to improve his participation instead of quitting. In the second quote, the child engaged with the stressor through reactive aggression towards his peers, which may have been a non-self-determined response to coercion. Again, depending on the situation, the child could have sought help from others, or tried to negotiate

with his peers by proposing a compromise or standing his ground. In physical activity contexts where there is little perceived control and choice, it appears children with DCD primarily perceive their three needs to be threatened rather than challenged. Recurring stressful situations, coupled with maladaptive coping responses, may lead to appraisals of loss and threat. Children who continually use coping responses such as helplessness, opposition, rumination, and social withdrawal are at risk for poor outcomes (Skinner & Zimmer-Gembeck, 2016).

**Developmental Considerations and Outcomes**

Whether children currently perceive themselves to be related, competent, or autonomous will differ based on the development of their self-system processes (Skinner & Wellborn, 1994). Children who develop secure early attachments with important others are less likely to interpret a teacher's refusal of a request or a group's exclusion as "they do not like me," whereas children with low perceived relatedness are more likely to experience neglect. Children with high perceived control are less likely to feel "stupid" or incompetent following a failed attempt to complete a task compared to children who believe they cannot control the outcome and consequently becomes upset, anxious, and discouraged. And, children with an autonomy orientation tend to interpret external events as providing them with information about conditions within the environment upon which to base decisions about behaviour on (Skinner & Wellborn, 1994). Children with a control orientation, however, interpret events as controlling and pressuring them to behave in certain ways. How children interpret and respond to stress is thus shaped by their development, which is concurrently shaped by the coping responses employed by them to deal with stress (Aldwin, 2007; Compas, 1998; Skinner & Zimmer-Gembeck, 2007; Zimmer-Gembeck & Skinner, 2011).

Optimal short-term outcomes of coping require changing or adjusting to the stressor by regulating the target aspect – behaviour, emotion, or orientation - without hampering any of the others (Skinner & Wellborn, 1994). For example, responding to an attack with opposition may cause greater emotional distress and conflict with children's beliefs about violence, whereas standing their ground may lessen emotional distress and align with their beliefs. The short-term outcomes associated with certain coping responses can influence the probability of children reengaging with that stressor in the future. Coping influences children's development through their reengagement in the face of obstacles and setbacks. Long-term outcomes of coping correspond with development that supports the three needs and transforms the self and context. Social development is characterized as the capacity to love and be loved, cognitive development refers to the ability to discover and understand how to effectively produce outcomes, and personality development is the construction of a coherent self that incorporates people's unique qualities with internalized sociocultural demands (Skinner & Wellborn, 1994).

When children successfully work through a stressful encounter, they develop a repertoire of coping resources that can be used for stressful encounters in the future (Skinner & Wellborn, 1994). This includes situations where children may have coped poorly, but learned from the experience through the support of an adult (Skinner & Zimmer-Gembeck, 2016). In contrast, ways of coping that actively work against the fulfillment of needs can result in maladaptive long-term outcomes and inhibit further growth. This includes (a) coping responses that prevent, avoid, or limit interactions with the social and physical environment, (b) coping responses that overwhelm children with negative emotions, making it impossible for them to learn from the situation, and (c) coping responses that direct interactions away from the fulfillment of needs and towards other targets (Skinner & Wellborn, 1994, p. 124). Given the prevalence of anxiety and

depression among children with DCD, they may be exposed to stressors they cannot handle on their own and/or not provided quality opportunities to acquire adequate and appropriate personal and social resources to cope adaptively, which is adversely impacting their development.

## Coping with Stress Proactively Versus Reactively

Skinner and Wellborn's (1994) motivational theory may help inform our understanding of how children with DCD experience and cope with stress in physical education. Two other models of coping, though, may be useful as well. Proactive and anticipatory coping involve detecting stressors in advance of a situation in order to facilitate efforts to prevent stress or reduce its effects (Aspinwall, 2005, 2011; Aspinwall & Taylor, 1997). This differs from most conceptualizations of coping, which focus on people's reactions to stressful encounters and the consequences that unfold once they have occurred. Whether people use proactive or anticipatory coping depends on the certainty and imminence of the stressor. Proactive coping has the potential to alter the outcome of a stressful encounter through the initiation of a response to a hypothetical stressor prior to its occurrence or early in its development (Aspinwall, 2011). Anticipatory coping involves efforts used to prepare for the consequences of a stressor that is likely to take place soon (Aspinwall, Sechrist, & Jones, 2005; Aspinwall & Taylor, 1997).

Aspinwall and Taylor's (1997) proactive coping model has five interrelated steps. The first step is geared towards the accumulation of personal and social resources and acquisition of skills to prepare people as much as possible should the stressor arise (Aspinwall & Taylor, 1997). People screen the environment to detect and appraise potential stressors in the second step. After a potential stressor has been detected, the situation is appraised to determine what it might be and possibly become. If people believe the potential stressor may be a threat, they will increase attention towards it, which then helps to facilitate the fourth step, preliminary coping efforts.

People engage in active efforts to prevent or minimize the detected stressor. Acquiring information about the stressor through problem solving and information seeking are thought to be more effective than avoidant forms of coping, and orient people toward averting the problem. People then acquire and use feedback as the stressful encounter develops to determine whether their preliminary efforts were effective and whether additional coping efforts are needed (Aspinwall & Taylor, 1997).

Proactive coping has the potential to minimize the intensity of stress experienced during a stressful encounter because people are likely to have more coping resources available to them prior to the encounter; options may be constrained after the stressor has occurred. Moreover, the accumulation of resources is likely to offset the consequences of the encounter or reduce the magnitude of its effects (Aspinwall & Taylor, 1997). However, people may still experience stress if they have not accumulated the *appropriate* resources to cope with the problem effectively. Since the situation has not yet occurred, the nature and properties of the stressor may be ambiguous to people, which will influence their appraisal and subsequent coping efforts. In this circumstance, social support from others is especially valuable as they can provide relevant information about the stressor for people to plan and act accordingly. People's abilities to engage in proactive coping efforts may be compromised though if detection and appraisal of the stressor evokes negative arousal. The regulation of negative thoughts and emotions may be prioritized, diverting attention and resources away from responding to the problem (Aspinwall, 2011).

Proactive coping temporally precedes anticipatory coping (Aspinwall & Taylor, 1997), which involves short-term engagement to prepare for the consequences of a stressful encounter (Breznitz, 1983). Efforts are aimed at minimizing potential threat or harm, or reappraising the situation as less threatening, depending on people's beliefs about their abilities to cope with the

situation effectively. Examples of proactive and anticipatory coping are evident in the DCD literature. Fitzpatrick and Watkinson (2003) explored the past-lived experiences of physical awkwardness in adults. One of their themes was *avoiding awkwardness* in which participants described efforts to reduce the risk of publicly displaying their clumsiness in physical education. Participants often used avoidant efforts, which may be attributed to the negative emotions they experienced at the thought of a failed performance. Some participants feigned illness or injury to avoid participation in activities they were not skilled at and others made up excuses to be absent from physical education. Many participants discussed how they would imagine worst-case scenarios for upcoming physical education classes, which led to worrying and wondering about what might happen. Their attention and resources may have been directed towards regulating their thoughts and emotions instead of dealing with external demands. However, coping efforts to address potential stressors may have been difficult to exert due to problems in accumulating appropriate resources such as support from the teacher or their peers.

When children with DCD have opportunities to acquire resources, they appear to use active efforts to prevent a stressful encounter. Drawing on a personal example, I was previously an adapted physical activity instructor for a motor skill development program and worked with children one-on-one. Each child chose a few motor skills for the term he or she wished to improve. Children commonly chose skills that would be required in the near future in physical activity contexts such as community recreation or physical education. One child in particular wanted to learn the fundamental skills involved in roller blading before having to participate in this activity in her physical education class. By learning these basic skills in advance, it allowed the child to be on par with her peers, and likely prevented or minimized ridicule from classmates and feelings of humiliation. While participants in Fitzpatrick and Watkinson's (2003) study and

the child in this example prevented or reduced experiences of stress associated with their motor difficulties, their use of avoidant versus active efforts may have different long-term outcomes. Participants in the former example may have been successful in achieving their short-term goals of not displaying their clumsiness and feeling embarrassed; however, it was probably at the expense of their long-term development. Re-engagement with a stressful encounter is needed to overcome an obstacle and facilitate development. The child in the latter example who demonstrated ongoing engagement to prevent a stressful encounter should experience positive long-term outcomes because she acquired resources and skills that can be added to her coping repertoire for similar future encounters.

## Conclusion

Multiple perspectives of stress and coping have been presented to better understand daily hassles experienced by children with DCD in physical activity contexts and the possible application of these perspectives in research. The overarching developmental framework (Skinner & Zimmer-Gembeck, 2016) affords the opportunity to investigate ways of coping in response to stressful encounters for children of different ages and developmental levels. The social factors that shape children's reactions and attempts to reduce stress can be studied as well. Researchers can examine how teachers, coaches, and peers influence experiences of stress and coping efforts in physical activity contexts for children with DCD. However, this developmental framework is still a work in progress so an alternative is the motivational theory outlined by Skinner and Wellborn (1994). This theory shows promise in adapted physical activity as its main tenets are cross-developmental. It focuses on three basic psychological needs and social contextual factors that either satisfy or deprive need fulfillment. Understanding what children with DCD perceive as stressful and how they cope with stressors in physical activity contexts is

important for their improving their functioning and well-being. Learning more about involvement, structure, and autonomy support, or neglect, chaos, and coercion in these contexts is critical for the development of environmental interventions. Furthermore, understanding children's use of future-oriented coping, which includes proactive and anticipatory coping (Aspinwall & Taylor, 1997), to avert potentially stressful encounters can inform personal interventions. Focusing on goal setting and attainment in physical activity contexts through the accumulation of appropriate resources and acquisition of skills may enable children with DCD to prevent or minimize stressors associated with their impairment, reducing their total stress exposure and keeping chronic stress under control (Aspinwall, 2011).

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Table 2-1

*Links Between Higher Order Categories of Coping and Adaptive Processes*

| **Higher Order Categories of Coping** | **Function in Adaptive Process** | **Adaptive Process** |
|---|---|---|
| 1. Self-reliance | Protect available social resources | Coordinate reliance and social resources available |
| 2. Support seeking | Use available social resources | |
| 3. Delegation | Find limits of resources | |
| 4. Isolation | Withdraw from unsupportive context | |
| 5. Problem solving | Adjust actions to be effective | Coordinate actions and contingencies in the environment |
| 6. Information seeking | Find additional contingencies | |
| 7. Helplessness | Find limits of actions | |
| 8. Escape | Escape noncontingent environment | |
| 9. Accommodation | Flexibly adjust preferences to options | Coordinate preferences and available options |
| 10. Negotiation | Find new options | |
| 11. Submission | Give up preferences | |
| 12. Opposition | Remove constraints | |

*Note.* Adapted from Skinner, Edge, Altman, and Sherwood (2003).

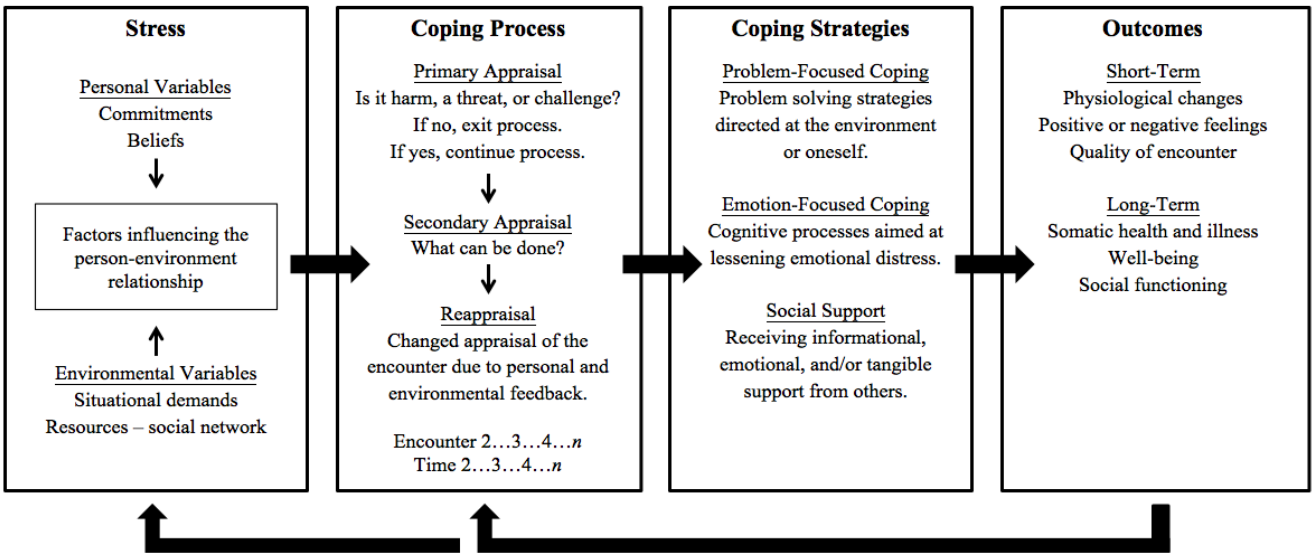


*Figure 2-1*. The theoretical schematization of stress, coping, and adaptation. Adapted from Lazarus and Folkman (1984).

| | RELATEDNESS | | COMPETENCE | | AUTONOMY | |
|---|---|---|---|---|---|---|
| | **Challenges to** | | **Challenges to** | | **Challenges to** | |
| | **Self** | **Context** | **Self** | **Context** | **Self** | **Context** |
| **Behaviour** | **Self-reliance**<br>Shouldering | **Support seeking**<br>Comfort seeking<br>Help seeking | **Problem solving**<br>Strategizing | **Information seeking**<br>Study<br>Observe | **Accommodation**<br>Cooperation<br>Concession<br>Committed compliance | **Negotiation**<br>Compromise |
| **Emotion** | Self-soothing<br>Accept responsibility<br>Concern for others | Trust | Encouragement<br>Determination<br>Confidence | Interest<br>Optimism<br>Hope | Acceptance | Blamelessness<br>Taking other's perspective |
| **Orient** | Protection<br>Shielding<br>Positive self-talk | Appreciation | Repair<br>Mastery | Prevention<br>Planning | Commitment<br>Conviction<br>Endorsement | Decision making<br>Goal setting<br>Priority setting |
| | **Threats to** | | **Threats to** | | **Threats to** | |
| | **Self** | **Context** | **Self** | **Context** | **Self** | **Context** |
| **Behaviour** | **Delegation**<br>Dependency<br>Demanding<br>Clinging<br>Pestering | **Isolation**<br>Withdrawal<br>Freeze | **Helplessness**<br>Random attempts<br>Flailing<br>Falling down the stairs | **Escape**<br>Flight<br>Avoidance | **Submission**<br>Perseverance<br>Rigidity<br>Unresponsiveness | **Opposition**<br>Aggression |
| **Emotion** | Self-pity<br>Whining<br>Shame | Loneliness<br>Desolation<br>Yearning | Self-doubt<br>Discouragement<br>Guilt | Pessimism<br>Despair<br>Fear | Self-blame<br>Disgust | Projection<br>Blame others<br>Venting<br>Explosion<br>Anger |
| **Orient** | Abandonment<br>Irritation | Cutting off | Panic<br>Confusion | Procrastination | Obsession<br>Rumination<br>Intrusive thoughts | Reactance<br>Revenge |

*Figure 2-2.* Higher order categories of coping organized around three concerns (relatedness, competence, autonomy), level of stress (challenge and threat), and target of coping (self and context). Taken from Skinner, Edge, Altman, and Sherwood (2003).

# CHAPTER 3

## Experiences of Stress in Physical Education for Elementary School Children at Risk for Developmental Coordination Disorder

The development of basic fine and gross motor skills is fundamental for positive functioning in day-to-day life. It influences children's performance of activities of daily living (e.g., zipping up or buttoning a shirt, manipulating dinner utensils; Summers, Larkin, & Dewey, 2008), activities of leisure (e.g., riding a bicycle; Dunford, Missiuna, Street, & Sibert, 2005), and academic tasks (e.g., manipulating pens and scissors, handwriting; Missiuna, Rivard, & Pollock, 2004). Furthermore, it impacts their abilities to participate in common childhood physical activity contexts such as physical education (Thompson, Bouffard, Watkinson, & Causgrove Dunn, 1994; Zimmer, Staples, & Harvey, 2016). Approximately 5 to 6% of school-aged children in North America are diagnosed with developmental coordination disorder (DCD), a neurodevelopmental disorder that results in significant and persistent difficulties in the learning and performance of coordinated motor skills (American Psychiatric Association [APA], 2013). The type and severity of motor difficulties differ amongst these children (Missiuna, Rivard, & Bartlett, 2003), yet experiences of stress in physical activity contexts at school appear to be widespread (Zimmer & Causgrove Dunn, 2019). The purpose of this study was to explore the lived experiences of children who demonstrated characteristics associated with a diagnosis of DCD, and were considered to be at risk for DCD, in physical education in order to develop a deeper understanding about what they experience as stress and how they cope with it.

Psychological stress is predominantly viewed as an experience that arises when there is a mismatch between a person's perception of a situation and his or her resources to cope with environmental demands (Aldwin, 2007; Lazarus & Folkman, 1984). Many variables contribute to and mediate the relationship between the person and the environment to collectively generate stress and influence its outcomes. Emerging evidence shows that motor difficulties are a primary source of stress for children with DCD (Cairney, Rigoli, & Piek, 2013) because they are the root

cause of many negative secondary consequences (Cairney, 2015). Researchers have extensively documented these consequences ranging from personal concerns such as poor physical fitness (Li, Wu, Cairney, & Hsieh, 2011; Rivilis et al., 2011; Schott, Alof, Hultsch, & Meermann, 2007), increased risk of obesity (Beutum, Cordier, & Bundy, 2013; Cairney, Hay, Faught, & Hawes, 2005; Cairney, Hay, Veldhuizen, Missiuna, Mahlberg, et al., 2010), low self-esteem, self-concept, and self-efficacy (Cairney, Hay, Faught, Mandigo, & Flouris, 2005; Piek, Baynam, & Barrett, 2006; Poulsen, Johnson, & Ziviani, 2011), inappropriate emotional and behavioural responses (Kennedy-Behr, Rodger, & Mickan, 2013a,b), to social concerns including few friendships, social isolation (Schoemaker & Kalverboer, 1994; Skinner & Piek, 2001; Smyth & Anderson, 2000), bullying (Bejerot, Plenty, Humble, & Humble, 2013; Campbell, Missiuna, & Vaillancourt, 2012), and inadequate support from teachers and other adults (Missiuna, Moll, King, Law, & King, 2006; Ruckser-Scherb, Roth, Lothaller, & Endler, 2013). Mental health problems, namely anxiety (Piek, Bradbury, Elsley, & Tate, 2008; Pratt & Hill, 2011) and depression (Campbell et al., 2012; Missiuna et al., 2014), seem to arise from this complex array of consequences.

A small number of qualitative studies have provided greater insight into the impact of DCD on children's experiences in different life contexts. Initially, these studies were largely from the perspectives of parents (Mandich, Polatajko, & Rodger, 2003; Missiuna et al., 2006; Missiuna, Moll, King, King, & Law, 2007; Segal, Mandich, Polatajko, & Cook, 2002; Stephenson & Chesson, 2008), but adapted physical activity scholars have recommended more research be conducted on the experiences of children with impairments from their own perspectives (Fitzgerald, 2006; Fitzgerald, Jobling, & Kirk, 2003). This is reflected in more recent studies that included children and adolescents with DCD (Barnett, Dawes, & Wilmut, 2013; Lingam, Novak, Emond, & Coad, 2014; Payne, Ward, Turner, Taylor, & Bark, 2013;

Zwicker, Suto, Harris, Vlasakova, & Missiuna, 2018), as well as adults who self-identified as demonstrating characteristics consistent with the disorder in childhood and adolescence (Fitzpatrick & Watkinson, 2003; Missiuna, Moll, King, Stewart, & Macdonald, 2008). One of the salient findings across these studies was that having DCD resulted in negative physical activity experiences at school.

**Experiences in Physical Activity Contexts at School**

According to parents, children's awareness of their motor difficulties based on peer comparisons and repeated movement failures produced emotional distress and negative self-perceptions (Mandich et al., 2003; Missiuna et al., 2007; Missiuna et al., 2006; Stephenson & Chesson, 2008). Children who were unable to play tag games on the playground and keep up with their peers often came home from school upset or in tears (Mandich et al., 2003; Missiuna et al., 2007). Parents further discussed how their children were treated more like a younger sibling than an equal by their peers (Segal et al., 2002), experienced isolation, played alone at recess or with much younger children than them (Mandich et al., 2003; Missiuna et al., 2007), and were bullied (Stephenson & Chesson, 2008). For some children, frustration that stemmed from negative physical activity experiences at school built up over time before it resulted in tearful outbursts. Missiuna and colleagues (2007) described one child who harboured her feelings about not being able to climb the ropes at school for a number of months before she told her parents. Repeated failed attempts often made children feel "stupid" to the extent that they gave up easily and stopped trying. To make matters worse, teachers at times trivialized the children's difficulties when parents requested additional help because they were not as severe as those of some other children (Mandich et al., 2003). This may reflect a lack of understanding about DCD on behalf of teachers (Missiuna et al., 2007; Missiuna et al., 2006). It appears that

children with DCD eventually learned strategies to avoid participation in activities they were not skilled at (Stephenson & Chesson, 2008) or diverted attention away from their motor difficulties (Missiuna et al., 2008; Segal et al., 2002) to avert social problems. For example, parents in Segal et al.'s (2002) study indicated that some children found alternate ways to participate in physical activities through more supportive than active roles, such as that of a scorekeeper, or negotiated a role as a teacher assistant.

Research focused on the experiences of adolescents and adults with DCD from their own perspectives revealed similar findings. Low motor competence and confidence constrained their participation in physical activities at school (Barnett et al., 2013; Fitzpatrick & Watkinson, 2003; Missiuna et al., 2008), and sometimes resulted in negative interactions with peers and teachers. Fitzpatrick and Watkinson (2003) stated that participants often felt the reactions to their physical awkwardness from others were unsupportive and hurtful. Participants recounted how failed attempts in physical education had everyone staring at them, laughing at them, or teasing them (Fitzpatrick & Watkinson, 2003; Missiuna et al., 2008). A participant in Barnett and colleagues' (2013) study described how the physical education teacher screamed at him and told him to run properly. Adolescents may be excluded by their peers or feel marginalized because they cannot participate in the same demanding and competitive activities (Missiuna et al., 2008; Payne et al., 2013). Most adolescents with DCD emphasized their dislike for competitive games and sports, and parents highlighted the need for developmentally appropriate activities (Barnett et al., 2013). The most frequent strategies adolescents used to try and hide their motor difficulties from others were avoidance and withdrawal from activities that demanded physical coordination and were too difficult (Missiuna et al., 2008).

While adolescents and adults acknowledged the negative consequences of having DCD, some still maintained a positive outlook and did not let their difficulties define them (Lingam et al., 2014; Missiuna et al., 2008; Zwicker et al., 2018). Social support offered by close friends appeared to be imperative for more positive experiences among adolescents, especially since the interests and values held by the social group influenced what was important to them (Lingam et al., 2014; Payne et al., 2013). In Lingam et al.'s (2014) study, one participant responded: "Oh, sports, is it important? No because a lot of my mates, including me, they don't really watch sports…" (p. 313). Payne and colleagues (2013) believe adolescents with DCD who identify as "not sporty," but share other interests with friends like music, may be protected from feelings of loneliness. Their participation in non-physical activities with friends may provide comparable social experiences as team sports. Participation in physical activities is most prevalent during childhood, but as children enter adolescence, these activities are often displaced by non-physical activities and interests (Gallahue & Cleland Donnelly, 2003). Participants in Missiuna, Moll, King, Stewart, and Macdonald's (2008) research talked about how their experiences at school improved over time because they were able to opt out of physical education in high school when it was no longer a required course, and focus on areas they were more competent at. Since adolescents generally have more options available to them, including withdrawal from physical activities, this may explain some of the apparent differences in the experiences of adolescents with DCD compared to children.

The findings above illustrate that most children with DCD, if not all, experience stress in physical activity contexts at school and find ways to cope. This is further supported by quantitative evidence derived from behavioural observations in physical education (Causgrove Dunn & Dunn, 2006; Thompson et al., 1994) and recess (Bouffard, Watkinson, Thompson,

Causgrove Dunn, & Romanow, 1996; Smyth & Anderson, 2000; Watkinson et al., 2001), self-perceptions of athletic competence (Piek et al., 2006; Skinner & Piek, 2001), as well as self-report measures of physical activity participation (Cairney, Hay, Faught, Corna, & Flouris, 2006; Cairney, Hay, Veldhuizen, Missiuna, & Faught, 2010). Children with DCD experienced negative interactions with peers, exhibited low perceived athletic competence, and spent minimal time engaged in both structured and unstructured physical activities and with little success. Given that physical education is part of the core curriculum in elementary schools, children with DCD need to be able to cope adaptively with stressors in this context or may be at risk for experiencing chronic stress and poor mental health. Disengagement in physical education may further worsen the motor difficulties of these children, relative to peers, if opportunities to receive instruction and practice a variety of motor skills are avoided (Wall, 1982, 2004). Exacerbation of the primary source of stress will only have a more profound effect on secondary consequences, and accumulation of stress will negatively impact their functioning and well-being.

**Theoretical Framework**

Transactions within physical education may be stressful for children with DCD because they threaten or challenge their innate psychological needs for relatedness (i.e., to have close relationships), competence (i.e., to be effective in their interactions with the environment), and autonomy (i.e., to self-direct their behaviour; Skinner & Wellborn, 1997). These three basic psychological needs are fundamental in Skinner and Wellborn's (1994) motivational perspective of stress and coping, which draws on self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2017). Coping is defined as "children's regulation of their behavior, emotion, and motivational orientation during psychological stress" (Skinner & Wellborn, 1994, p. 107). Regulation under stress differs between children and changes with age and developmental level

(Skinner & Wellborn, 1994, 1997; Skinner & Zimmer-Gembeck, 2007). The extent to which children feel their basic psychological needs are met will determine how well they cope with a stressful situation. Children actively construct beliefs about themselves, the social context, and interactions between the two, which are referred to as self-system processes (Skinner & Wellborn, 1997). Individual differences in experiences of stress are attributed to these self-system processes because they are based on children's histories of interactions with the physical and social environment, and are shaped by cognitive and social processes that help them interpret these interactions. Whether children's basic psychological needs are met is primarily determined by their perceptions of events in the social context (Skinner & Wellborn, 1994).

Events in the social context that facilitate experiences of involvement, structure, and autonomy support can fulfill children's needs for relatedness, competence, and autonomy respectively, whereas neglect, chaos, and coercion can thwart these needs (Skinner & Wellborn, 1994). Children who form warm and trusting relationships with peers and teachers are more likely to engage in physical education and seek help from others in times of need. Unfortunately, many children with DCD have experienced exclusion by their peers (Bouffard et al., 1996; Mandich et al., 2003; Missiuna et al., 2007; Missiuna et al., 2008; Payne et al., 2013). Teachers who hold negative beliefs about instructing children with impairments (Obrusnikova, 2008) can reproduce the same negative attitudes in children without impairments through the behaviours they model (Qi & Ha, 2012), making it unlikely that children with DCD will feel a sense of belonging. Structured contexts that include the provision of clear expectations for behaviour, developmentally appropriate activities, optimal challenges, instructional feedback, and peer or teacher assistance will foster children's need for competence. This contrasts with chaotic contexts, which are unpredictable, inconsistent, noncontingent, discriminatory, and unfair (Reeve,

Deci, & Ryan, 2004). Teachers often report that they feel ill equipped to instruct children with impairments in physical education because of a lack of training and professional development (Coates & Vickerman, 2008; Haegele, Zhu, & Davis, 2018; Obrusnikova, 2008). Children with DCD have been found to spend less time engaged in adaptive behaviours that improve their skill acquisition when they have low perceived competence and high perceptions of a performance-oriented climate in physical education, which emphasizes interpersonal competition, normative standards, and public evaluation (Causgrove Dunn & Dunn, 2006). The climate teachers create is important for children with DCD because of the physical demands imposed by the curriculum. Children who perceive contexts as highly chaotic will likely interpret setbacks and failures as evidence of their incompetence (Skinner & Wellborn, 1997). Experiences in physical education that involve graded performance, peer comparison, or competition may be appraised as stressful because they undermine children's autonomy, making them feel pressured by rules, rewards, and punishment to behave or express their feelings in particular ways (Deci & Ryan, 1985). Children with DCD who receive negative feedback from the environment, including criticism from teachers and movement failures that signify their inability to attain a set of standards, may lose motivation to keep trying (Skinner & Wellborn, 1997). Autonomy supportive contexts, on the other hand, will direct children's engagement towards learning activities. They will interpret environmental feedback as information that can be used to guide performance, not control it.

Ways of coping must be explored to understand how children with DCD respond to stressful situations in physical education (Skinner & Zimmer-Gembeck, 2007). To this end, Skinner, Edge, Altman, and Sherwood (2003) have identified 12 broad categories of coping that act as organizing frameworks for specific coping responses. These coping responses are intended to regulate the self or context in response to a wide range of stressors appraised as threats or

challenges in order to address children's concerns about relatedness, competence, and autonomy (Skinner & Wellborn, 1994). For a description of the 12 categories of coping, refer to Table 3-1. Specific coping responses are directed at managing children's engagement or disaffection with a stressful situation through active or passive behaviour, positive or negative emotions, and motivational orientation towards or away from the encounter. Research has indicated that children with DCD have significantly more problems regulating the self and context compared to their peers (Ruckser-Scherb et al., 2013), use fewer types of coping responses, and their responses tend to be more passive and avoidant (Watson & Knott, 2006).

Coping with stress is associated with both short- and long-term effects on development (Skinner & Wellborn, 1994). Children may cope with stress by altering interactions in the immediate context, such as avoiding an activity in physical education so their poor motor coordination is not on display. However, coping responses tend to elicit consequences and evaluations. For example, responses can influence how teachers and classmates perceive and behave towards them, which in turn, influences children's self-perceptions and coping reactions and responses in subsequent stressful situations (Eisenberg, Fabes, & Guthrie, 1997; Skinner & Wellborn, 1994). Adaptive responses to stress are typically associated with positive developmental outcomes, whereas maladaptive responses elicit negative developmental outcomes. Children who cope in more active, flexible, and positive ways are therefore more likely to experience positive short- and long-term developmental outcomes. In contrast, children who cope in more passive, inflexible, and punitive ways may experience positive short-term outcomes, but not long-term outcomes (Skinner & Wellborn, 1994). This is because avoidance may be effective in escaping from a difficult activity in the short-term to prevent embarrassment

or humiliation, but will cease or limit future engagement in similar stressful situations - along with the development of resources children need to experience growth in physical education.

### Purpose

Psychological stress appears to be a common phenomenon for children with DCD in physical activity contexts at school; however, their experiences have not been researched through a stress and coping lens. The purpose of this study was to explore the lived experiences of children at risk for DCD in physical education in order to develop a deeper understanding about what they experience as stress and how they cope with it. Children at risk for DCD were the focus of this research since the disorder is not well known in the education system or recognized by teachers (Missiuna et al., 2006). An interpretative phenomenological analysis (IPA; Smith, Flowers, & Larkin, 2009) approach was used to acquire detailed accounts from children about their experiences and inform pedagogical practices to mitigate stress and increase engagement. The central question guiding this research was "How do children at risk for DCD experience and cope with stress in physical education?"

## Method

### Methodology

The theoretical foundations of IPA are phenomenology, hermeneutics, and idiography (Smith et al., 2009). Phenomenology is the study of experience and involves the detailed examination of a participant's perception of an event from a first-person perspective. Researchers guided by this qualitative methodology consider the participant's experience to be a source of knowledge and recruit participants who have shared an experience to describe the essential qualities of the phenomenon (Creswell, 2013). This experience is to be understood as a whole rather than reduced down to its parts (Smith & Osborn, 2015). Hermeneutics refers to

interpretation and requires the researcher, as the primary instrument for data collection and analysis, to make sense of participants' sense-making and interpret the meaning behind their experience (Smith et al., 2009). Understanding what a particular experience is like for a person and how this particular person interprets what is happening to him or her is the study of idiography. This approach emphasizes understanding how particular participants experience an event before moving to general claims about their shared experiences (Smith & Osborn, 2015).

**Participants**

Ethics approval for this study was obtained from the University Research Ethics Board in a large Western Canadian city. Participants were recruited over a one-year period from two schools in similar socioeconomic areas during the months of September to June, and then through a physical activity centre at a university that offers summer camps for children who demonstrate characteristics associated with sensory, physical, and developmental impairments during July and August. Prior to commencing the study, approval was sought from the school board and physical activity centre. A purposeful sampling approach was used to recruit a total of six children. To ensure the sample was homogenous based on important features, children needed to meet the following inclusion criteria to participate in the study: (a) be in Grades 4 to 6, (b) communicate fluently in English, and (c) demonstrate characteristics associated with DCD. Children 10 to 12 years of age have the abilities to reflect on and communicate their experiences, and coping responses are relatively uniform according to the most conclusive evidence presented by Skinner and Zimmer-Gembeck (2016). Grades 4 to 6 were therefore chosen to recruit children in this age range. These grade levels also focus on similar physical education curriculum content, but of increasing complexity, because they fall within the same division. Participants were required to speak fluently in English since the primary method of data collection was interviews

and I am not fluent in other languages. A two-stage approach recommended for field-based research that involves the use of multiple methods to obtain information about the diagnostic criteria for DCD was employed to increase the probability of identifying children at risk for DCD (Missiuna et al., 2011). For a diagnosis of DCD to be made, children's acquisition and execution of their coordinated motor skills must be substantially below that expected given their chronological age and opportunity for skill learning and use (Criterion A), significantly and persistently interfere with activities of daily living appropriate for their chronological age and impact participation in various life contexts (Criterion B), emerge during the early developmental period (Criterion C), and not be better explained by an intellectual, visual, or neurological impairment that effects movement (Criterion D; APA, 2013).

The first stage of this study focused on the identification of children via use of the *Developmental Coordination Disorder Questionnaire* (*DCDQ*). This 15-item questionnaire provides an indication of a child's motor functioning for daily tasks performed at home, school, and in the community (Criterion B; Wilson et al., 2009). It is labeled the *Coordination Questionnaire* so parents are not concerned about a medical condition being evaluated. When used as a screening tool, it is to be completed by parents before standardized testing occurs to clarify the impact of the child's motor difficulties on his or her overall performance. Parents were asked to compare the degree of coordination their child had with other children of the same age for each question, which consists of a likert scale from 1 to 5 (1 = *not at all like your child*, 3 = *moderately like your child*, 5 = *extremely like your child*). Although researchers believe mothers and fathers may have different perspectives of their child's motor functioning, no studies have indicated such differences in ratings (Wilson et al., 2009). Questions represent three distinct areas of motor functioning: control during movement, fine motor/handwriting, and

general coordination. For children 10 to 15 years of age, total scores that fall between 15 and 57 indicate they have or are suspected of having DCD, while scores between 58 and 75 indicate they probably do not have DCD. Children who obtained total scores above the cut-off but whose parents rated them poorly in particular areas were considered eligible to participate. The identification of children can be quite variable depending on the sample (Blank, Smits-Engelsman, Polatajko, & Wilson, 2012). The questionnaire has lower accuracy in correctly identifying children with and without DCD in the general population, such as in regular schools, compared to clinical settings, although, it is currently recommended over other questionnaires designed to screen for children with DCD (Schoemaker & Wilson, 2015).

All children in Grades 4 to 6 of the two participating schools, and parents of children registered in summer camp, were sent home with an envelope containing an information letter, consent form, assent form, and the *DCDQ* (Appendices A through G). Written informed consent was obtained from parents and assent from children who were interested in participating. Parents who gave consent were instructed to complete the *DCDQ*, as part of the process to determine their child's eligibility, before returning the signed consent and assent forms to the principal or summer camp instructor in a sealed envelope. I collected the returned envelopes and calculated the *DCDQ* total scores for all potential participants (i.e., those with permission to participate). Children who met the criteria mentioned above and also had learning and/or attention difficulties were eligible to participate since these symptoms often co-occur with DCD (APA, 2013). However, as per the diagnostic criteria for DCD, children with conditions that might have better explained their motor difficulties such as visual, physical, and intellectual impairments were not recruited for participation. These conditions were listed as additional inclusion and exclusion criteria in the information letter sent home with children and parents (Criterion D). Parents were

responsible for determining their child's eligibility based on the presence or absence of the inclusion and exclusion criteria.

Children thought to be at risk for DCD were subsequently assessed on the *Movement Assessment Battery for Children* (*MABC-2*; Henderson, Sugden, & Barnett, 2007), as part of the second stage, to confirm their inclusion. The assessment was administered during school hours for children recruited through schools, and before or after camp hours for children recruited through the physical activity centre. The *MABC-2* is a standardized motor test commonly used in research to determine the presence of motor impairment because of its accuracy and the ability to incorporate judgment about a child's performance (Criterion A). The assessment consists of both fine and gross motor tasks divided into three skill domains: manual dexterity, aiming and catching, and balance. A total test score ≤ 16th percentile is typically used to identify children along the continuum of motor impairment and was used as the cut-off score for this study. Scoring is based on the time in which a child completes the task or the number of successful trials he or she completes. Four boys and two girls at risk for DCD who were 10 or 11 years old, with an average age of 10.3, met the eligibility criteria and participated in this research. One child was in Grade 4, three in Grade 5, and two in Grade 6. Table 3-2 contains the demographic information of the participants.

**Data Collection**

**Pre-interview activities.** Interviews are used in qualitative research as a way to learn about the thoughts and feelings of participants, and are particularly suited to seek deeper understanding of the stress and coping process in specific contexts (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). However, one of the challenges with interviews is creating conditions that afford participants the opportunity to recall significant experiences (Ellis,

2006). To address this, pre-interview activities (PIAs) were used to provide children with time and space to reflect on their experiences by illustrating what a good and bad day in physical education was like for them. Children with physical impairments in a study by Goodwin and Watkinson (2000) completed a similar activity, prior to participating in a focus group, and discussed different elements of physical education considered to underlie experiences of stress (Skinner & Wellborn, 1994). The broad nature of these PIAs also allowed children to illustrate what they felt comfortable sharing since many things could contribute to them having a good or bad day. Children were provided with instructions for completing the two PIAs, at home during quiet time, at least one week prior to the interview (Appendix H). Children were told they could make drawings, collages, or something on the computer, but all children chose to create drawings. The children were asked to bring the PIAs to the first interview. A conversational relationship was established through discussion of the drawings, which helped to build rapport for the remainder of the interview.

**Interviews.** Families had an opportunity to select the location of the two semi-structured interviews on the consent form. Locations included school, home, the university, or another place of their choice. Semi-structured interviews conducted with children at school occurred during school hours, while interviews at the families' homes took place after school or summer camp hours. I started the first interview by asking children about their experiences in school more generally to help them feel comfortable with the process (Appendix I). Examples of questions were, "Can you tell me about your school? What are some parts of school that make it good? What are some parts of school that make it hard or a challenge?" These questions led into discussion about the PIAs the children completed. Children were asked to describe what they drew and what was happening in each drawing, in whichever order they preferred. This

comprised most of the interview. Children were then asked to share additional good or bad experiences they had in physical education that were different from their PIAs. Probes such as "How did that make you feel? What were you thinking about? What did you do?" were used as necessary to prompt children to elaborate on their experiences and ways they coped with stress (Compas et al., 2001). I did not ask children about particular stressful encounters they may have experienced in physical education during the first interview, like being made fun of by peers, because IPA methodology requires the researcher to be open to hearing the lived experiences of participants (Smith et al., 2009). As a result, I asked more direct questions during the second interview. The first interviews lasted 18 to 30 minutes, with an average time of 24 minutes.

A second semi-structured interview was scheduled with the children after the transcripts from the first interviews were transcribed verbatim and analyzed. The analysis informed the development of the second interview guides, which were specific to each child. The first half of the interview included questions to obtain more in-depth information about unique experiences of stress discussed by each child in the previous interview (Appendix J). Questions were "During the first interview, you told me that you do not have as much energy as the other kids in the class. Can you tell me more about that?" or "You said that you want to leave when you have to do activities you do not like, but know you cannot. Do you feel like you have to participate? Can you tell me more about that?" The second half of the interview was meant to affirm that the participants identified with the emerging themes. One of the questions was, "Some children talked about asking the teacher for help when they could not do something in physical education. Have you done this before? Can you tell me about a time you asked your teacher for help in physical education?" A more coherent understanding of distinct and shared experiences of stress

in physical education for children at risk for DCD was developed after the second interview. These interviews ranged from 11 to 30 minutes, with a mean of 19 minutes.

**Reflective field notes.** I reflected on the research process by writing field notes. My perceptions were recorded after each interview, which included information about the time and setting of the interview, non-verbal behaviours of participants, salient topics, questions to ask participants in the second interview, and possible emerging themes. The field notes contributed to the development of the second interview guides, analysis of the findings, and creation of an audit trail of decisions made during data collection and analysis that links the raw data to the final interpretative report.

**Data Analysis**

I transcribed verbatim the audio-recorded interviews, except for personal identifiers, which were removed from all transcripts. Transcripts were given numerical codes and pseudonyms were used in place of participant names to ensure anonymity. Children were given the opportunity to choose their own pseudonym, although most did not. An electronic master list was created to store and organize pertinent information for the study such as participant names, gender, age, grade levels, interview transcript codes, pseudonyms, location of interviews, and length of interviews. I analyzed the interview transcripts using the framework outlined by Smith et al. (2009): (1) reading and re-reading, (2) initial noting, (3) developing emergent themes, (4) searching for connections across emergent themes, (5) moving to the next case, and (6) looking for patterns across cases. These steps are not meant to be linear, but iterative, and guide the researcher through the process. I began analysis by immersing myself in the data. Since IPA is committed to the detailed examination of individual cases, an idiographic approach was taken by examining the transcripts case by case (Smith & Osborn, 2015). I read the first transcript

multiple times to become familiar with the account. I then made comments in the left-hand margin of the transcript to paraphrase the significance of what the participant said, identify contradictions in sense-making, connections that came to mind, and record preliminary interpretations (Smith & Osborn, 2015). Once this process was completed for the whole transcript, I documented emerging themes in the right-hand margin. In IPA, a *theme* refers to a concise phrase that captures the essence of a participant's lived experience (Smith et al., 2009). Themes transform the initial notes made by the researcher into a higher level of abstraction, but still reflect what the participant actually said. Emerging themes represented stressors, coping responses, and short-term outcomes discussed by the participant because they helped describe *what* the child experienced and *how* he or she experienced it. Similar themes emerged throughout the transcript, but no themes were omitted or given special attention at this point.

The next step involved reordering the emerging themes - from the order in which they appeared in the transcript to a more analytical order - to search for and make sense of their connections (Smith et al., 2009). I constantly compared themes against the transcript to determine whether they should be separate or clustered with other themes sharing a similar pattern. Themes were grouped together based on similar sources of stress, functions of coping responses, and similar outcomes. The clusters of emerging themes that captured the participant's experiences were organized in a table and given names to create superordinate themes. Themes that did not fit well with the superordinate themes or were not very "rich" in evidence within the transcript were discarded. I worked through the process of moving from concise phrases of the participant's account, to the more abstract, for the remaining interview transcripts. Each new transcript was approached on its own terms in order to construct new themes (Smith et al., 2009). I then looked for patterns across the cases. Hard copy tables of superordinate themes for all

children were printed to look for connections across them. A table of superordinate themes for the group was produced to capture stressors, coping responses, and outcomes that were central to participants' experiences in physical education.

I progressed through all six steps for the first set of interviews to understand particular experiences expressed by each child, as well as those shared by the children, in order to conduct the next interview. I then completed the iterative process again for the second set of interviews, but made some modifications to align with its purpose. Each child's second transcript was compared against his or her first transcript when recording initial notes, developing emergent themes, and searching for connections across emergent themes since the children were asked to elaborate on experiences already discussed. The two interviews were not distinct and therefore, I did not treat them as such. Emerging and superordinate theme names developed during the first round of analysis were used as necessary for the second analysis to illustrate similar experiences and grouping of themes for each child. A table of superordinate and emerging themes was created for each child's second interview. Before looking for patterns across all cases, I produced a third table of themes for each child that merged his or her superordinate and emerging themes from the first and second interview. This method ensured the last step of analysis took into account all salient experiences discussed by the children. I then drew on Skinner and Wellborn's (1994) theoretical framework of stress and coping to inform the interpretation of the findings. The final superordinate themes are organized around the basic psychological need they align with most – relatedness, competence, or autonomy – because social contextual factors that support or thwart one need also impact the others. The coping responses children used to satisfy each need are described in the results section, but interpreted according to the 12 broad categories of coping in the discussion section.

**Evaluation Criteria and Strategies**

Criteria for judging the quality of IPA research include sensitivity to context, commitment and rigor, transparency and coherence, and impact and importance (Smith et al., 2009; Yardley, 2015). The researcher must acknowledge his or her integral role in the research process for the inquiry to be sensitive to context. This involves not only awareness of how his or her professional and personal background may influence the process, but how personal characteristics may impact the participants. My motivation to study the phenomenon of psychological stress came from spending time in elementary physical education classes for my master's research observing the movement performance of children to identify those at risk for DCD. While not the focus of my observations, I noticed children who were thought to be at risk for DCD often become frustrated when practicing skills, withdraw from playing games, sit on the sidelines, and continually ask the teacher to get a drink of water or go to the washroom. I wondered if these were coping responses. In some classes, I had observed teacher behaviours that could have evoked stress for the children, and resulted in efforts to cope, but questioned what else may have caused them stress. To conduct research on this phenomenon, I had to reflect on how my personal characteristics may have impacted children's engagement in the research activities. Children who viewed me as an authoritative figure, for example, might have felt uncomfortable and limited what they shared. To increase children's comfort levels, I ensured all data collection sessions occurred in a familiar setting for them such as their school, home, or the university. PIAs and open-ended interview questions were used to learn about children's experiences in a manner that allowed them more freedom to discuss what was salient to them. Throughout data collection and analysis, I attempted to suspend assumptions held from my prior experiences. I met regularly with my supervisory committee members to discuss data collection

and analysis, which enabled me to become further aware of these assumptions. A reflexive journal was kept to document my role throughout the entirety of the study and following each meeting. Reflective field notes were recorded after each interview and throughout analysis to acknowledge my biases and critique decisions made in the research process.

Commitment requires thoughtful engagement with the participants. I established rapport with the children during administration of the *MABC-2* and the two interviews. Methodological rigor was achieved through pilot testing the PIAs and first interview guide with two children in Grades 4 and 6, not included in the study, to refine the data collection methods and gather information about the research question. Given that children at risk for DCD do not have intellectual impairments or communication deficits that would impact their engagement in the interview, I pilot tested the research activities with two children not believed to be at risk for DCD. The original PIAs and interview guide included several activities and questions to get to know the children better and their experiences generally. I made revisions to simplify the methods and capture experiences more directly related to how children experienced and coped with stress in physical education. The number of PIAs was reduced to two activities that aligned with the research question. The terms stress and coping were removed from questions in the interview guide to increase their comprehensibility. Rigor was achieved during data analysis by comparing my coding of the data against the perspective of my supervisor. These discussions helped identify potential themes I had not captured and increased the coherence and comprehensibility of my interpretation.

Coherence refers to the "fit" among the theoretical approach, research question, methods, and interpretation of the data (Yardley, 2015). The research question posed focuses on children's lived experiences of stress and coping in physical education, which is consistent with IPA, as

well as the data collection and analysis methods chosen. I provided abundant details to describe the participants, data collection methods and procedures, and data analysis, thus making the research transparent. This information should help readers understand how I conducted the study and arrived at my conclusions. The impact and importance of this research relates to its theoretical and practical implications. This is the first study to use a theoretical framework of stress and coping to understand the experiences of children at risk for DCD in physical education. Skinner and Wellborn's (1994) motivational perspective of stress and coping has the potential to advance knowledge in the field of adapted physical activity and inform pedagogical practices in physical education.

## Results

Experiences of stress in physical education for children at risk for DCD can be described in three themes: (a) they hurt me, (b) it's hard for me, and (c) I have to. The children talked about experiences in which they sustained psychological and physical harm from their peers, encountered difficulties in performing activities, and felt pressure to meet the teacher's demands.

### They Hurt Me

Children discussed experiences in which they were rejected, injured, and ridiculed by their peers when participating in group activities. Rejection was most common among children who did not experience close friendships or acknowledged they had difficulty getting along with others. Jeff shared a story of asking to play badminton with a group of children. "I asked if I could play and they yelled, 'No!' Made me angry and sad." He was angry with the children for yelling at him and sad he was not allowed to play. In response to this stressful experience, Jeff explained, "I just walked away…[and] played with other children." Most children who experienced rejection sought acceptance from others to feel a sense of belonging or help from the

teacher to resolve the problem. Children who sought support from their teacher expressed that they wanted him or her to confront the group that rejected them, but were instead told to find a different group to play with. Katie recalled:

> I asked if I could join their game – mantracker - and they said, "No because you're not tough enough and fast enough to do it." [I felt] mad. I went to go get the teacher and told them what they were doing to me. She said just let them play their game and go find someone else to play with. I followed the teacher's instructions.

Even though the children did not receive the help they hoped for, they felt happy when they were included. All children eventually experienced inclusion after being rejected, but it did not occur as quickly for Daniel and Tyler. They were confused by the response from their peers. When Daniel was asked why his peers would not allow him to play, he said "…they don't really tell me why." Both Daniel and Tyler isolated themselves by playing alone and tried to rationalize why they were rejected. Neither of them was able to determine the reason though so they asked a different group of children if they could join their game once they were no longer upset.

Although the children wanted to be included by others, they worried about getting hurt in competitive games such as tag, dodgeball, and hockey. Some children, like Tyler, thought their peers intentionally targeted them to cause physical harm. He said:

> …When I get hit, someone would put me back in the game and then another person would throw a ball at me. …Someone hit me in the face with the ball. I think they said it was an accident, but I mostly think it was on purpose.

Children became angry after they were injured, but continued to play the game because they thought their teacher would make them and they were scared of getting in trouble. Katie, however, was hit in the eye with a hockey puck two times by her peer. She initially tried to work

through the problem on her own, but started to feel at a loss when the situation recurred. She explained, "I worked through the problem on my own the first time and then it kept happening so I talked to the teacher…because I felt like I can't do this anymore by myself." Katie felt relieved when the teacher talked to the child and it did not occur again. Unfortunately, her bruised eye then became a source for ridicule. "They were like to my eye, 'Oh your eye looks so disgusting like someone threw up on it.' I felt really mad. I told the teacher and then they talked to the kid." Aside from physical attributes, peers would often make fun of the difficulties children experienced in physical education by saying, "You can't do this, you can't do that." Children who felt their teacher would support them, such as Katie, asked for help to manage problems with their peers. In contrast, children who did not feel connected to their teacher or were often believed to be the instigator in problems with their peers, like Tyler, would not inform them about the situation. They would instead distance themselves from their peers who ridiculed them and try to find more supportive children to be around.

**It's Hard for Me**

Another source of stress for children was their lack of competence in performing various activities. They perceived activities like gymnastics that necessitated a range of motor abilities to be hard, as well as activities that required them to manipulate objects such as basketball, badminton, and soccer. However, most of them were able to overcome these obstacles to varying degrees. Aimee expressed that she disliked soccer because she was not good at kicking. She would get frustrated when they had to play a game of soccer in class, but attempted to improve her performance on her own in hope that she would get better (see Figure 3-1). She explained, "I try to kick it better…[and] usually get better at it after a little bit." Children who persevered when confronted with a difficult task generally experienced some success after repeated attempts.

They believed the task gradually became easier over time, which boosted their confidence. Jeff mentioned that shooting a basketball was a challenge for him because "you push the ball off and have to jump at the same time." Jeff continued to practice though despite the task being difficult because he believed he was able to do it.

Children who had a good relationship with their teacher sought guidance from them to improve their performance. They often learned effective strategies that resulted in more positive movement experiences.

> It was like scooter soccer and I wasn't quite good at it because I had to move the scooter with my feet and kick the ball with my feet so it was hard. I was like asking my teacher what do I do. She was…telling me…I could use the scooter to kick the ball. I did better. It kind of made me feel like I was good at the game. I can win. (Tyler)

These children experienced less failure than children who chose to persevere on their own because they would receive help from the teacher after a few unsuccessful trials. Repeated failures can negatively impact how children feel about themselves and their attitudes toward physical education. However, the instruction teachers provided led to larger improvements that made children feel more confident in their abilities and changed their outlook. After Eric received pointers in floor hockey, he thought he was no longer going to fail physical education. "Now I'm like this subject isn't that hard. All you need to do is put in the effort and you'll be better at the thing."

Despite children learning how to achieve certain outcomes from their teachers, some still struggled to perform activities due to limitations imposed by their bodies.

> If someone gets the birdie right at me, I try to hit it. I think I'm maybe going to hit it, but I miss…. I keep trying to get the swing. My wrist, my arms won't really let me try to hit

> it and my body doesn't want me to get a hit, but I've got a hit a few times. I don't know. It just does not want me to get a hit. (Daniel)

Daniel understood how to swing the badminton racquet to make contact with the birdie, but his body worked against him when trying to execute the skill. Though this was perplexing for him, he continued to persevere and use the strategies he was taught. All children were aware of the limitations of their bodies that prevented them from performing at the same level as their peers or keeping up with them. Children often fatigued easily when participating in activities that required lower body strength or endurance.

> This one time I was playing floor hockey and it was just like a really high paced game and I couldn't really keep up. I think it's because we were running so much and I ran out of breath. I didn't have that much energy so I felt light headed. I just sat on the stage. It made me feel better to just relax instead of being in that high paced game. (Eric)

Like Eric, other children were able to recognize their limits and temporarily withdrew from the activity to regain their energy. Some children indicated their teacher was fine with them taking time to rest, but did not comment on adaptations made to the activities so they could participate more fully. Peers tended to make fun of the children when they did not perform as well as them or needed to take a break during group activities. However, they were ridiculed less often when individually practicing skills.

**I Have To**

Children perceived physical education as stressful when they felt forced to do what the teacher instructed them to. Most children complained about the lack of choices their teacher provided for activities and sometimes questioned the value of the activities planned. They

expressed a desire to be involved in decisions and have more free time to do activities of interest to them. Eric explained:

> Sometimes kids get bored of the unit and they just want other choices to do stuff. Maybe the teacher could say, "Oh, what do you want to do today? Do you want to do dodgeball, this, or this?" instead of "Oh, we're just going to do this."

However, a lack of choice in activities was less likely to be appraised as stressful if the activities planned were fun or easy. Aimee was okay with having to participate in activities she liked or was competent at, but dreaded having to participate in activities that were too hard for her such as basketball. The children worried about having to participate in activities in which they doubted their abilities to be successful and their difficulties would be noticeable to others. In these situations, children considered avoiding the activity but subsequently chose not to, even though they wanted to, because of fear of punishment. They also refrained from expressing their views to the teacher to avoid negative repercussions.

> In this picture, it's like me running laps and it says, "I can't believe we have to run laps all gym." Laps are really tiring because when you're done the first four you're already starting to walk, and then if you have to run laps for the full 30 minutes, that's way too much! I get kind of mad because we can do anything else but we have to run like all gym. I just do the activity and stay out of trouble. (Eric; Figure 3-2)

Instead of focusing on the negative for the remainder of the class, Eric diverted his attention to pleasurable things. He ran alongside his friends and talked to them about sports. His friends played an integral role in helping him deal with the situation in a more positive way because they stayed by his side even if he became fatigued and needed to walk. Daniel, who did not have close friends, would instead think about his cats and dog. "I think about the things that make me happy

when I have a bad day. It helps a lot…because it gets me calm." Not all children were able to shift their focus of attention though. Similar to Eric and Daniel they reluctantly complied with their teacher's instructions, but became fixated on these negative experiences and continued to feel anger and frustration. These feelings intensified when the lack of choice for activities subjected them to being picked on by their peers. Tyler was not doing well in a game and soon became a target for his peers. He recalled:

> I was getting a little bit sick of it. The second and then the third time I was just done. I wanted to play another activity that I liked, but it was my teacher's decision. I think she would make me get out of the gym or something.

Children also expressed frustration over their peers not following the rules, which jeopardized their efforts to stay out of trouble. Katie mentioned several times her class was told to demonstrate good behaviour or else they would be sent to the principal's office. She explained, "[You] pay attention, use your ears, and keep your mouth shut. When you're not paying attention you get yelled at…and when you don't like do what the teacher tells you to do you usually go to the office." The thought of going to the principal's office scared her so much that she took extra precaution to avoid or minimize punishment. She would separate herself from friends who were misbehaving and notify the teacher immediately of situations she thought she might get in trouble for to persuade the teacher of her innocence. Afterwards Katie said, "I feel a bit better, relieved, so I don't get in trouble." Most children tried to distance themselves from peers who were not doing what they were told to prevent association with them. Jeff explained that he would stop talking to his friends when they were not listening because he did not want to be punished. Experiences of stress were heightened for the children when the actions of their peers conflicted with their goal of staying out of trouble. However, experiences of stress were

diminished when friends helped them achieve other goals. Tyler became fed up with his peers constantly cheating. When his friend decided to get back at the opposing team for not playing fair during a soccer game, Tyler joined in his efforts.

> When people always score, the other team always says, "It doesn't count!" They were trying to change the rules to win…and make my team lose. When the other team got a score…we were just like, "It doesn't count!" There was like an argument. [My friend] was like, "I'm goalie now." He threw the ball and then kicked it…into the other net.

Tyler knew the way he behaved was "wrong," but was more concerned at the time with seeking revenge on the opposing team. He was happy when his team won.

## Discussion

The aim of this study was to explore the lived experiences of children at risk for DCD in physical education in order to develop a deeper understanding about what they experience as stress and how they cope with it. All children at risk for DCD in the current study experienced stress in physical education. The theme *they hurt me* reflected experiences of stress characterized by psychological and physical harm from peers, *it's hard for me* represented their struggles to perform activities, and *I have to* reflected the pressure they felt to do what the teacher requested. The children appraised these stressors as both threats and challenges to their basic psychological needs for relatedness, competence, and autonomy respectively and employed different coping responses considered adaptive and maladaptive (Skinner & Zimmer-Gembeck, 2016). Children coped in more adaptive than maladaptive ways in response to stressors that impinged on their needs for relatedness and competence, but coped in an equal variety of adaptive and maladaptive ways to fulfill their need for autonomy. Close relationships with peers, and especially the teacher, seemed to impact how well children at risk for DCD coped to satisfy their needs for relatedness

and competence. Interestingly though, these social supports influenced children at times to cope in more maladaptive ways to satisfy their need for autonomy.

**Relatedness**

Children at risk for DCD who had close friends experienced less stress in physical education due to negative interpersonal interactions, whereas children without close friends experienced more instances of rejection, injury, and ridicule. Although the majority of children did not have close friendships, their relationship with the teacher was significant in alleviating experiences of stress. This is because the children coped by *seeking support* from the teacher who then intervened when they were injured or ridiculed to mitigate the problem. It is important to note, however, that teachers were less likely to intervene when children experienced rejection and instead advised them to find another group to play with. Children who did not seek support from the teacher, on the other hand, chose to *isolate* themselves from peers who rejected or ridiculed them. While isolation is typically considered maladaptive, it can be argued to be an adaptive response to stress in this circumstance. For example, Daniel and Tyler decided to reduce their exposure to stress by isolating themselves from their peers who rejected them. They used *self-reliance* to deal with their thoughts and emotions when isolated, followed by *support seeking* from a different group of peers once they felt better. Both Daniel and Tyler experienced feelings of inclusion after multiple attempts to cope. Children who followed the teacher's instructions and found a different group to play with experienced positive outcomes eventually as well. Of concern though are the outcomes these children might experience long-term. It is recommended that teachers facilitate quality peer interactions through cooperative activities (Sparks, Dimmock, Whipp, Lonsdale, & Jackson, 2015) and set a tone for the class in which all children are valued and respected by one another so they experience a sense of belonging. This may be particularly

important for children at risk for DCD who do not feel connected to their peers or the teacher. It will help them establish positive relationships and feel part of a group, and in turn, lessen instances of psychological and physical harm currently experienced as they are often targeted or made fun of because of their differences.

**Competence**

Children's relationship with the teacher also played a role in their abilities to cope with difficult or challenging activities. All children at risk for DCD initially used *problem solving* to try and successfully perform the activities they were instructed to do. Children who had a close relationship with the teacher, though, subsequently coped through *information seeking* when their efforts were unsuccessful. Strategies provided by the teacher led to greater experiences of success compared to children who attempted to master the activity on their own and experienced little to moderate success at best. While the latter children tried to hold positive beliefs about their efforts, repeated failure may result in them coping in more maladaptive ways such as *helplessness* or *escape* in the future without appropriate supports - particularly as the physical education curriculum becomes more advanced with increasing grade level. It is critical that teachers are able to identify children who struggle in physical education and provide individualized instruction and feedback to enhance their learning (Haegele & Sutherland, 2015). This includes adaptations to large group games as some children at risk for DCD needed to temporarily *escape* from more strenuous activities. Withdrawal from activities is more noticeable when children are playing games with others versus individually practicing skills. Adaptations might decrease the likelihood of them being ridiculed and mitigate possible negative effects on their self-esteem.

**Autonomy**

Unlike relatedness and competence, children at risk for DCD used an equivalent mix of adaptive and maladaptive responses to deal with feeling coerced by the teacher to do what they were told. Children continually used the phrase "have to" when describing these experiences, which indicates the teacher may have used controlling language. Some children also shared that their teacher threatened to punish students who exhibited undesirable behaviour. Two children used *accommodation* to take their mind off the source of stress, but most children coped through *submission* when they felt coerced to participate in individual activities, and *isolation* or *opposition* when pressured to participate in group activities. Submission is a maladaptive response, which for children at risk for DCD, seems to be marked by repetitive negative thoughts about a stressful encounter. Throughout the two interviews, children brought up these experiences many times and it was apparent from their body language these experiences bothered them. In contrast, isolation once again was considered adaptive in the short-term because it helped children remove themselves from peers who interfered with their efforts to stay out of trouble and lessened experiences of stress. As well, opposition reduced stress for Tyler when his peers were cheating during a game and therefore arguably could be adaptive. However, prolonged use of isolation and opposition will likely result in negative long-term consequences since children will continue to experience similar encounters in the future without efforts to minimize the source of stress. It would be more beneficial for children to *negotiate* with their peers by persuading them to change their behaviour or standing firm against them, or *seek support* from the teacher if they are available, to decrease these occurrences. The ways of coping children used may reflect their internalization of values and practices from those they feel most connected to (Katartzi & Vlachopoulos, 2011). Teachers should be careful of the expectations

they set for the class, such as telling children not to say anything or keep their opinions to themselves without discussion of circumstances in which it is appropriate, and their adoption of certain practices.

The use of rewards rather than punishment to control classroom behaviour may be appraised as less of a threat and more of a challenge to children, influencing their ways of coping. Daniel was the only child who shared how his teacher used a reward system where points earned for good behaviour were exchanged for free time. Daniel looked forward to earning points since it meant he would be able to engage in any activity of his choice. Rewards are often used to increase participation of children, especially for nonintrinsically motivating activities, although the value of these activities may not be internalized (Sun, Li, & Shen, 2017). If teachers explained the benefit of the activities planned, in addition to using a reward system, children at risk for DCD may be less reluctant to participate in certain activities. Controlling teacher behaviours thwart children's need for autonomy and may explain why they did not cope as well with feelings of coercion or pressure. Researchers have found that teachers who develop activities based on children's preferences, competencies, sense of challenge and fun, communicate using noncontrolling language free of pressure and coercion, attentively listen to them, and accept their negative feelings as valid reactions to demands are generally perceived to be more autonomy supportive (Reeve et al., 2004; Reeve & Jang, 2006).

What children at risk for DCD perceived to be stressors in physical education was consistent with the literature that examined children's experiences from their own perspectives. Sources of stress included being teased (Barnett et al., 2013) and excluded by peers (Payne et al., 2013), as well as struggling to participate in activities such as competitive games and sports (Barnett et al., 2013; Lingam et al., 2014; Zwicker et al., 2018). While children sometimes

discussed problems they had with their teacher, parents were more concerned about the lack of support the teacher provided (Mandich et al., 2003; Missiuna et al., 2007; Missiuna et al., 2006). Similar to the current study, children with DCD reported dealing with adverse situations in a variety of ways that would be considered adaptive and maladaptive. However, it appears from parent interviews that children with DCD mainly cope poorly with stress in physical activity contexts at school unless intervention is provided (Mandich et al., 2003; Missiuna et al., 2007; Missiuna et al., 2006) or they are able to conceal their difficulties (Segal et al., 2002). This discrepancy may be attributed to the perspectives from which these experiences were examined.

Developing physical competence is a central goal of learning in physical education (Sun & Chen, 2010) and a stressor reported by all children in previous research and the current study. Most researchers who examined children's experiences first hand focused on 12 to 16 year olds, with the exception of Zwicker et al. (2018) who interviewed 8 to 12 year olds. The age of the children and their history of experiences may contribute to how well they cope with stress. Physical activity participation among children with DCD is related to their self-efficacy, which influences persistence, skill acquisition, and choice of activities (Engel-Yeger, 2015). Children who believe they are able to accomplish a task are more likely to persist when tasks are difficult, whereas children with low self-efficacy may give up or avoid certain tasks. Adolescents with DCD tend to have poorer perceptions of their physical competence compared to younger children with DCD (Piek et al., 2006), which may be due to a history of movement failures. Children with DCD who are not provided quality opportunities to develop skills and resources to cope adaptively in physical education may appraise more situations as threats over time, especially towards their need for competence. They may become overwhelmed by stress and find

it difficult to cope in more adaptive ways until they reach high school and have more autonomy in the selection of subjects.

### Limitations

There are a couple limitations in this study that should be noted. First, IPA requires a homogenous sample of participants to understand the essence of their lived experiences (Smith et al., 2009). While all children had motor impairment, the type and severity of their impairment differed. Children with more severe motor impairment, particularly in gross motor skills, may experience stress in physical education to a greater degree than children with more mild or fine motor impairments. However, Green and Payne (2018) believe children's perceptions of their own limitations caused by their impairment may be more important in understanding their participation in certain contexts than the actual severity of their impairment. Second, children's abilities to recall experiences of stress in physical education are limited by their memory of events. Children were provided PIAs at least one week in advance of the first interview, though, to stimulate thoughts about their experiences.

## Conclusion

Psychological stress is a common phenomenon experienced by children at risk for DCD in physical education. While previous qualitative studies demonstrate evidence of experiences of stress in physical activity contexts at school, and researchers make reference to ways of coping, this is the first study to explore the lived experiences of children at risk for DCD in physical education to understand what they experience as stress and how they cope with it. Children at risk for DCD were confronted with stressors that interfered with their innate commitment to fulfill their basic psychological needs for relatedness, competence, and autonomy, but largely used adaptive responses to cope and lessen experiences of stress. Coping responses address

particular demands and are shaped by the resources available to children within the context where the transaction occurs (Skinner & Zimmer-Gembeck, 2007). It requires researchers to understand what is happening as a stressful encounter unfolds to make interpretations about "how well" children coped and possible short- and long-term effects. Because coping is a subjective process, it necessitates learning about these experiences from a first-person perspective. Future research should continue to understand stress in physical education for children with DCD from their own perspectives, which may vary among children of different ages and with access to different supports, and further investigate environmental factors that contribute to and mitigate these experiences. The perspectives of peers, teachers, and paraprofessionals who support children with DCD in managing their stress could be examined to supplement children's experiences and inform intervention.

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Table 3-1

*Descriptions of the 12 Broad Categories of Coping*

| Category of Coping | Description |
|---|---|
| Self-reliance | Desiring, choosing, or attempting to deal with a stressful event on one's own. |
| Support seeking | Requesting or approaching a caregiver, teacher, adult, friend, or peer for advice or emotional support. |
| Delegation | Dependency, maladaptive help seeking, complaining, whining, and self-pity. |
| Isolation | Staying away from or preventing a caregiver, teacher, adult, friend, or peer from knowing about a stressful situation or its emotional effects. |
| Problem solving | Strategizing or generating alternate means for changing the stressful situation. |
| Information seeking | Attempts to learn more about a stressful situation, including its course, causes, consequences, and meanings as well as strategies for intervention and remediation. |
| Helplessness | Giving up, passivity, or confusion in the face of demands. |
| Escape | Physically leaving the site of a stressful situation or mentally withdrawing from a stressful situation. |
| Accommodation | Active attempts to change one's view of a stressful situation in order to see it in a more positive light or take one's mind off a stressful situation through engaging in an alternative pleasurable activity. |
| Negotiation | Active attempts to work out a compromise between the priorities of the individual and the constraints of the situation. This may include priority setting, proposing a compromise, persuasion, reducing demands, trade-offs, and deal making. |
| Submission | Repetitive negative or anxious thoughts about a past, current, or future stressful episode. |
| Opposition | Refusing to cooperate, active non-compliance, or doing the opposite of what is requested or expected. This may include projection, reactance, anger, aggression, discharge, venting, and blaming of others. |

*Note.* Adapted from Skinner, Edge, Altman, and Sherwood (2003) and Zimmer-Gembeck and Skinner (2011).

Table 3-2

*Demographic Information of Children at Risk for DCD*

| Pseudonym | Gender | Age | Grade | DCD-Q Total Score | MABC-2 Percentile | Interview Location |
|---|---|---|---|---|---|---|
| Katie | Female | 10 | 4 | 60 | 16 | School |
| Jeff | Male | 10 | 5 | 28 | 0.5 | School |
| Tyler | Male | 10 | 5 | 35 | 1 | Home |
| Daniel | Male | 11 | 5 | 42 | 9 | Home |
| Aimee | Female | 10 | 6 | 38 | 16 | School |
| Eric | Male | 11 | 6 | 58 | 16 | School |

*Note.* DCDQ = Developmental coordination disorder questionnaire; MABC-2 = Movement assessment battery for children (2nd ed.)

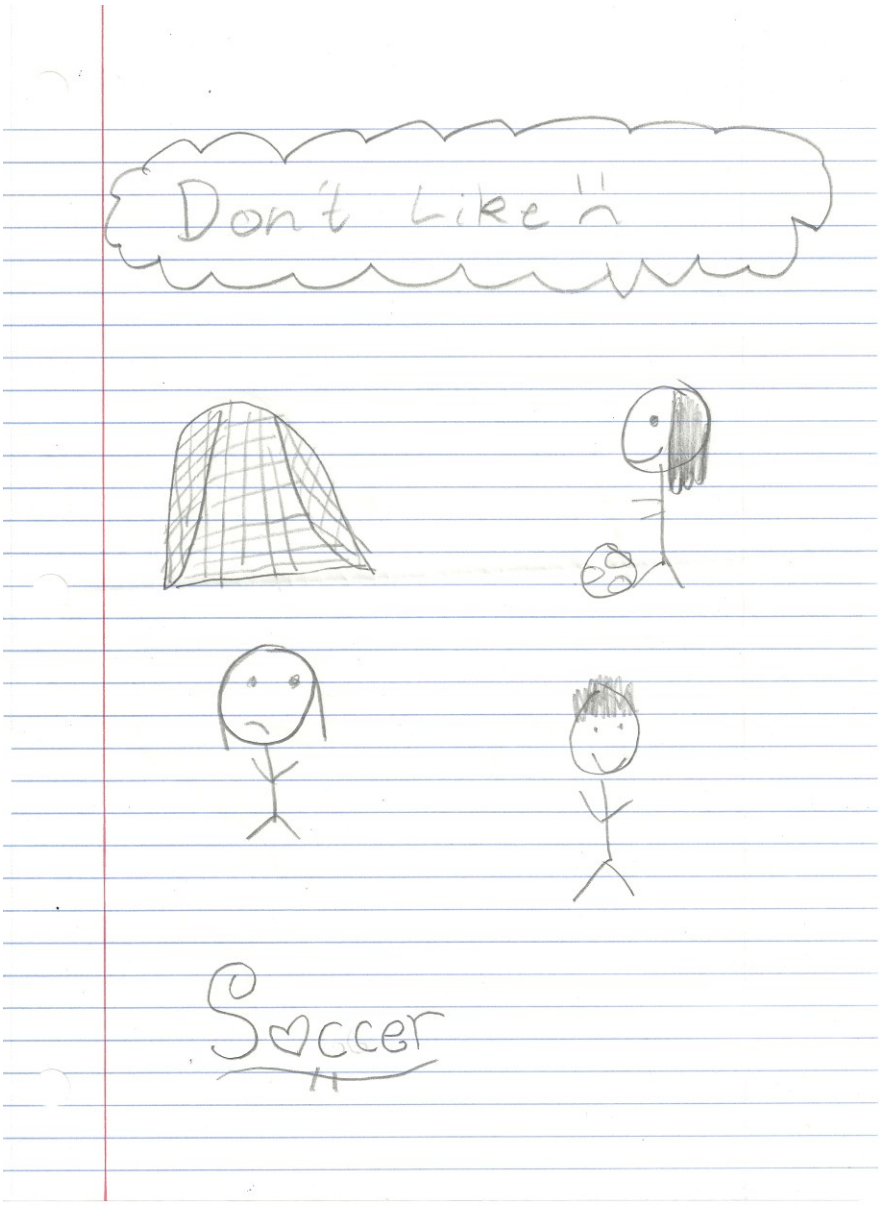


*Figure 3-1.* Aimee's drawing of a bad day in physical education.


*Figure 3-2.* Eric's drawing of a bad day in physical education.

# CHAPTER 4

## Elementary Generalist Teachers' Perspectives of and Experiences with Children Thought to be at Risk for Developmental Coordination Disorder in Physical Education

Children who experience substantial difficulties with learning and performing coordinated motor skills appropriate for their chronological age that significantly and persistently interfere with their daily functioning in various life contexts, meet the primary diagnostic criteria for developmental coordination disorder (DCD; American Psychiatric Association [APA], 2013). Unfortunately, many adults in these children's lives such as their parents, physicians, and teachers do not seem to understand the underlying reasons for their motor problems and therefore consider them to be transitory or self-correcting (Cairney, 2015). DCD places unique challenges on children and has more recently been considered a primary source of stress (Cairney, Rigoli, & Piek, 2013). Psychological stress is as an experience that arises from a mismatch between a person's perception of a situation and his or her resources to cope with environmental demands (Aldwin, 2007). Research has shown that children with DCD experience negative psychosocial consequences as a result of their motor difficulties that often lead to depressive and anxious symptomatology in childhood and adolescence (Mancini, Rigoli, Cairney, Roberts, & Piek, 2016; Mancini, Rigoli, Roberts, & Piek, 2019). Elementary school years may expose children with DCD to new and greater demands like achieving normative standards and interacting with people outside their immediate family, impacting their activity limitations and participations restrictions.[2] It is imperative that adults who play a significant role in these children's day-to-day lives, such as teachers who regularly work with them, understand their needs and help guide them through difficult experiences. Chronic stress can arise from persistent hardships faced over

[2] The biopsychosocial model conceptualizes *disability* as "a complex phenomenon, reflecting the interaction between features of a person's body and features of the society in which he or she lives" (World Health Organization, 2001). The term represents *impairment* (i.e., problem in body function or structure), *activity limitations* (i.e., difficulty encountered by a person in executing a task), and *participation restrictions* (i.e., problem experienced by an individual's involvement in life situations).

a prolonged period of time, but can be mitigated through supportive conditions and instead enable children with DCD to flourish.

**Awareness and Understanding of DCD**

Movements described as clumsy, slow, and inaccurate emerge during the early developmental years among children with DCD (APA, 2013). While most parents have reported that they recognized these motor difficulties early on, they struggled to receive appropriate support for their child. Many parents characterized the process of obtaining a diagnosis for their child as a long and frustrating journey because DCD is not well known and under recognized in educational and medical communities (Maciver et al., 2011; Missiuna, Moll, King, King, & Law, 2007; Missiuna, Moll, Law, King, & King, 2006). A diagnosis is typically not made before 5 years of age because of the variability in the rate at which children acquire motor skills. Identification generally occurs during elementary school years when learning demands are increased and performance is compared against standards (Missiuna, Pollock, et al., 2008). In order for children to access specialized services, they must receive a diagnosis from a medical professional as the education system approaches disability from a medical model[3] (Haegele & Hodge, 2016). Only children whose difficulties are considered "severe" enough to warrant a diagnosis are typically provided support from a multidisciplinary group of professionals. Teachers are often the ones who refer children for diagnostic assessment since they have the opportunity to observe and evaluate the pervasiveness of children's difficulties across many curricular areas (Missiuna, Moll, Law, et al., 2006). However, teachers have been found to

[3] The medical model conceptualizes *disability* as an abnormal or problematic biological trait directly equated to diagnosis (Peers, Spencer-Cavaliere, & Eales, 2014). The aim of intervention, under this model, is to correct the problem within the child.

provide the least accurate referrals to medical professionals (Dunford, Street, O'Connell, Kelly, & Sibert, 2004).

In a study by Wilson, Neil, Kamps, and Babcock (2013), between 92 and 97% of teachers were familiar with neurodevelopmental disorders such as autism, specific learning disorder, and attention-deficit/hyperactivity disorder, but only 23% were familiar with DCD. Variables such as age, gender, and type of motor difficulties seem to influence identification of these children. Younger children who demonstrated below average movement performance were sometimes mistaken for having DCD when it was attributable to developmental variability (Kourtessis et al., 2008). Teachers reported more concern for gross motor difficulties in boys and fine motor difficulties in girls, which was thought to be due to socialization and early stereotypical messages of gender-based movement activities (Rivard, Missiuna, Hanna, & Wishart, 2007). Boys who demonstrate poor performance in physical education are thus more likely to be identified than girls, whereas girls who demonstrate poor performance for classroom-based tasks are more likely to be identified than boys. When teachers familiar with DCD in Wilson et al.'s (2013) study were asked to identify specific features of the disorder, 74% reported they were aware of common motor features such as motor learning difficulties and fine and gross motor delays, while less than 43% were aware of common non-motor features like poor physical fitness, sensory processing challenges, poor social skills, low self-esteem, and anxiety. Teachers seemed to only be able to identify emotional and behavioural concerns when they were more severe or pervasive (van den Heuvel, Jansen, Reijneveld, Flapper, & Smits-Engelsman, 2016). However, researchers are concerned that teachers who recognize these non-motor difficulties may then focus on them to the detriment of children's motor difficulties (Rivard et al., 2007).

Teachers in Rivard and colleagues' (2007) study believed it was more important to seek intervention for children with gross motor difficulties than fine motor difficulties. Researchers have speculated this may be because teachers lack confidence in the remediation of gross motor difficulties compared to fine motor difficulties since most of the school day is spent in the classroom (Green et al., 2005; Junaid, Harris, Fulmer, & Carswell, 2000). On the other hand, teachers may have recognized the importance of gross motor skills in children's abilities to engage with peers in physical activities and the ridicule and rejection that may have resulted for children who demonstrated poor performance of these skills. Approximately 85% of teachers surveyed felt the education system could not adequately support children with DCD because of a lack of awareness and understanding of the disorder (Wilson et al., 2013). It is essential that elementary generalist teachers obtain a greater understanding of children with DCD given that they instruct them across curricular areas. The way in which teachers perceive children with impairments can influence their expectations of and interactions with them, impacting children's engagement in learning activities (Causgrove Dunn & Zimmer, 2019; Haegele & Hodge, 2016). Relative to other school personnel, teachers have the greatest opportunity to positively contribute to the well-being of children with DCD through the use of supportive pedagogical practices.

**(Perceived) Needs of Children with DCD**

Jasmin, Tétreault, and Joly (2014) explored the needs of elementary school children with DCD from multiple perspectives – children, parents, teachers, and service providers. Most children had positive perceptions of their self-esteem and about half reported positive sociability and determination. However, nearly all children experienced challenges with fine and gross motor skills and many found physical education problematic. The children did not request specific supports related to their skills, but parents, teachers, and service providers did. They

believed children needed supports to improve their fine and gross motor skills, organizational skills, social skills, and management of their emotions. Children seem to view themselves in a more positive light than parents and teachers (Missiuna & Pollock, 2000; Missiuna, Pollock, Law, Walter, & Cavey, 2006) and express different expectations for support, whereas the perceptions of various adults are consistent. Parents in Izadi-Najafabadi, Ryan, Ghafooripoor, Gill, and Zwicker's (2019) study indicated that unsuitable programs, lack of resources for teachers to provide necessary supports, and the physical, cognitive, and social demands of activities at school had a negative impact on their child's participation. All of the children in Jasmin et al.'s (2014) study had a diagnosis of DCD and therefore, the majority of them received remedial education in class from service providers and teachers. Although, teachers felt they had insufficient access to information and training on DCD. They requested more educational opportunities on academic learning intervention approaches, additional services at school such as occupational therapy, and access to adaptations and special materials.

Teachers frequently report that they receive minimal preparation and professional development opportunities to effectively instruct children with impairments, especially in physical education (Coates & Vickerman, 2008; Haegele, Zhu, & Davis, 2018). The beliefs teachers hold about the outcomes of teaching children with impairments are thought to influence their attitudes toward instructing them (Azjen & Fishbein, 1980). Several researchers have found teachers' perceived competence for teaching (Kowalski, & Rizzo, 1996; Rizzo & Kirkendall, 1995), quality of teaching experiences (Folsom-Meek, Nearing, Groteluschen, & Krampf, 1999), and adapted physical education course work (Combs, Elliott, & Whipple, 2010) were associated with their attitudes toward teaching children with impairments in physical education. In addition, their years of experience instructing children with impairments was significantly correlated with

their perceived competence and quality of teaching experiences (Obrusnikova, 2008). Overall, most teachers have ill feelings toward the inclusion of children with impairments in physical education because of their inadequate training and lack of experience (Block & Obrusnikova, 2007). Though, teacher attitudes vary based on the type of impairment children have. They tend to hold negative beliefs about instructing and including children with emotional, behavioural, attentional, and learning impairments (Hersman & Hodge, 2010; Morley, Bailey, Tan, & Cooke, 2005), largely due to their perceived inabilities to accommodate them (Obrusnikova, 2008).

Teachers may contribute to experiences of stress for children with DCD when they do not understand their needs and ways to address them. Zimmer and Causgrove Dunn (2019) reviewed the research on the physical activity experiences of children with DCD at school and concluded that many of them seem to perceive physical education, in particular, as stressful. They struggle to engage in the same physical activities as their peers (Mandich, Polatajko, & Rodger, 2003; Missiuna et al., 2007; Missiuna, Moll, King, Stewart, & Macdonald, 2008; Payne, Ward, Turner, Taylor, & Bark, 2013) and participate less frequently in both structured and unstructured activities than them (Bouffard, Watkinson, Thompson, Causgrove Dunn, & Romanow, 1996; Cairney, Hay, Veldhuizen, Missiuna, & Faught, 2010; Jarus, Lourie-Gelberg, Engel-Yeger, & Bart, 2011). This may be because their motor functioning has been found to be a significant predictor of their participation (Izadi-Najafabadi, Ryan, Ghafooripoor, Gill, & Zwicker, 2019) and their performance of fundamental movement skills, which are needed to be successful in physical education, is poor (Zimmer, Staples, & Harvey, 2016). Children with DCD eventually learned to avoid physical activities they were not competent at, though, to prevent negative psychosocial consequences that may have intensified experiences of stress (Fitzpatrick & Watkinson, 2003; Missiuna, Moll, King, et al., 2008). For example, some teachers became

frustrated with children and verbally criticized them for not achieving expected outcomes (Barnett, Dawes, & Wilmut, 2013; Missiuna et al., 2007). These attitudes, manifested through behaviours, can be reproduced in children without impairments (Qi & Ha, 2012). Participants in Fitzpatrick and Watkinson's (2003) study recalled the reactions of peers to their physical awkwardness. While they perceived the reactions of some to be empathetic, sympathetic, supportive, or helpful, most reactions were perceived to be unsupportive and hurtful. The attitudes of teachers might partially explain why many children with DCD are rejected (Segal, Mandich, Polatajko, & Cook, 2002), ridiculed (Fitzpatrick & Watkinson, 2003), and excluded (Zwicker, Suto, Harris, Vlasakova, & Missiuna, 2018) by their peers without DCD.

**Pedagogical Practices in Physical Education**

The purpose of physical education is to effectively prepare children to be active for life by learning *through* the physical body (Ennis, 2010). The ways in which teachers support engagement among children with DCD is critical given that their motor impairment often makes it difficult for them to participate. One of the implications of using a medical model in the education system, however, is that a child with an impairment "must be adjusted to fit into the existing classroom practices, rather than reshaping classroom practices for the child" (Reindal, 2008, p. 137). Scholars in adapted physical activity advocate that physical education curriculum should be *adapted* to meet the diverse needs, abilities, and interests of children, and professionals should be *adaptive* or continually engaging with their attitudes and pedagogical practices (Sherrill, 2004). In most provinces and territories across Canada, generalist teachers are responsible for physical education instruction at the elementary level (Mandigo, 2010). Elementary generalist teachers can influence experiences of stress for children with DCD through pedagogical practices that satisfy or deprive the fulfillment of their innate psychological

needs for relatedness, competence, and autonomy (Deci & Ryan, 1985; Ryan & Deci, 2017; Skinner & Wellborn, 1994). These basic psychological needs are essential for physical, psychological, and social health (Deci & Ryan, 2000) and are highly relevant in the context of physical education (Sun, Li, & Shen, 2017). Relatedness is the need to feel connected to others and experience a sense of belonging, competence is the need to approach and master achievement-oriented tasks, and autonomy is the need to endorse and self-determine one's behaviour (Deci & Ryan, 1985).

Children's engagement in physical education is impacted by teacher behaviours that influence relationships with peers, development of skills, expression of views, and pursuit of interests (Curran & Standage, 2017; Reeve, 2012). Children with DCD will feel more connected to teachers who communicate in warm and friendly ways, encourage and facilitate peer cooperation, and demonstrate care and concern (Sparks, Dimmock, Whipp, Lonsdale, & Jackson, 2015). They will develop competencies when teachers provide clear expectations for behaviour, support, and feedback (Curran & Standage, 2017; Skinner & Wellborn, 1994). However, teachers should consult children about their needs, interests, and goals in physical education to provide more individualized instruction (Coates & Vickerman, 2008). Children will perceive themselves to be more autonomous in their learning if teachers attentively listen to them, allow time for independent work, praise them when they demonstrate improvement or mastery, offer words of encouragement, provide suggestions when required, and acknowledge their perspectives (Reeve & Jang, 2006). Although limited, previous research indicates some teachers have undermined children's needs through neglect (Barnett et al., 2013), performance-oriented climates (Causgrove Dunn & Dunn, 2006), and coercion (Missiuna et al., 2007).

**Purpose**

It is apparent from the extant literature that the majority of teachers lack awareness of DCD and knowledge of its consequences, as well as adequate training to support children's participation in physical education. However, it is not entirely clear what teachers' understanding of DCD is since researchers asked only teachers familiar with the disorder to identify its specific features (Wilson et al., 2013) or provided them scenarios with clinical descriptions of children with DCD to understand the variables that influenced their perceptions (Rivard et al., 2007). Further, how teachers address the perceived needs of children with DCD in physical education has not been examined. The purpose of this study was to explore elementary generalist teachers' perspectives of and experiences with children thought to be at risk for DCD in physical education to determine areas where additional training is needed to support children's innate psychological needs, increase their engagement, and promote positive outcomes. Because perceptions can influence behaviour, this interpretive description study examined the relationship between the following research questions: (1) What is elementary generalist teachers' understanding of DCD? and (2) What is their role in addressing the perceived needs of children thought to have DCD in physical education? Teachers' perspectives of and experiences with children believed to demonstrate characteristics associated with DCD were investigated due to the unfamiliarity of the disorder in the education system at large, and also specifically where this research took place. Children were referred to as having movement difficulties (MD) because the term reflects functional problems with fine and/or gross motor skills that are readily observable. Common labels used in previous studies to refer to children thought to have the disorder, such as at risk for DCD, were intentionally avoided since the suggested presence of a medical condition may have skewed or limited teachers' perspectives.

# Method

## Methodological Approach

Qualitative methodology provides an organizing framework of processes and procedures to explore questions in greater depth. Specifically, the methodological framework of interpretive description (Thorne, 2008) bridges the gap between research and practice by generating understandings of complex phenomena in a manner that are optimally relevant and useful to practice (Thorne, 2016). The foundational underpinnings of interpretive description straddle constructivism and pragmatism. It adopts the philosophical assumptions of constructivism in that it emphasizes the perspectives of professionals, which reflects multiple and shared realities that are constructed through lived experience and interactions with others (*ontology*; Thorne, 2008). The relationship between the researcher and the participant is inseparable because they interact and influence one another (*epistemology*). Interpretive description explicitly values and attends to subjective and experiential knowledge as one of the fundamental sources of practical insight (Thorne, 2008, p. 74), and asserts that careful attention should be given to the time and context in which these experiences are expressed. However, interpretive description also draws on some of the philosophical assumptions that underlie pragmatism because it views reality as that which is useful and practical (*ontology*). Pragmatists are concerned with what works and solutions to problems, so instead of a focus on methods, importance is placed on the problem being studied and the questions asked about the problem (Creswell, 2007). This means researchers can look to many approaches to collect and analyze data because they are free to choose methods, techniques, and procedures that best meet their needs and purposes (*methodology*).

## Participants

Ethics approval for this study was obtained from the University Research Ethics Board,

before receiving permission from two school districts in a large Western Canadian city and surrounding area. A combination of purposeful and snowball sampling approaches was used to recruit elementary generalist teachers who could offer practical insight about the research questions and were recommended to participate by colleagues (Patton, 2002). A maximum variation sampling strategy was employed to capture perspectives from diverse teachers in terms of their years of teaching experience, current grade level, and knowledge of physical education. Principals of participating schools and the health and wellness consultant for one of the two school districts were provided study documents, which included an information letter and consent form (Appendices K and L), to distribute to teachers who met the following inclusion criteria: (a) instructed children in Kindergarten to Grade 6, (b) had at least one year of experience teaching physical education, (c) were considered a generalist teacher at their school, (d) and communicated fluently in English.

Teachers who taught children in Kindergarten to Grade 6 were the focus of this research to understand their perceptions of children with MD across all elementary years. Teachers had to have a minimum of one year of experience instructing physical education in order to provide specific examples of children they had taught who they believed had MD, and to discuss how they interacted with these children. To be considered a generalist, teachers were required to instruct the majority of curricular areas for their class. Teachers also had to communicate fluently in English since the primary source of data collection was an interview. Written informed consent was obtained electronically via email from teachers who were interested in participating. A total of 12 teachers (3 men, 9 women) were recruited who represented all elementary grade levels, had 2.5 to 20 years of teaching experience ($M$ = 8.9), and completed 0

to 20 post-secondary physical education courses ($M$ = 8.6). Table 4-1 includes demographic information of the participants**.**

**Data Collection**

**Interviews.** Teachers were given the opportunity to select the location of the interview on the consent form, which included their school, home, or another location of their choice. One semi-structured interview was conducted with each teacher. The interviews took place during or after school hours for teachers who chose school as their preferred location, and outside school hours for teachers who preferred for it to occur at their home or another location of their choice. I began the interview by asking teachers background information to learn about them and their experiences. An interview guide was then used to gain insight into teachers' perspectives of and experiences with children with MD in physical education (see Appendix M). Teachers were initially asked questions about their general experiences teaching physical education such as "Can you describe what a typical physical education class is like for you?" to build rapport and help them feel comfortable with the process. Most of the interview questions revolved around the problem being explored. These questions enabled me to gather information relevant to the study, while allowing teachers more freedom to discuss what was of importance to them (Patton, 2002).

The first cluster of questions focused on teachers' understanding of MD. One of the questions was, "What kinds of things come to mind when you hear the term movement difficulties?" After teachers had an opportunity to respond, I provided an explanation of MD so teachers shared specific experiences they had with these children in their class for the remaining questions. I added the explanation to the interview guide after it was pilot tested with two elementary teachers, not included in the study, because they talked about children with a diagnosis of cerebral palsy and physical impairments. Teachers were told the term was used in

the academic literature to describe those who look like "average" children in that they do not have visible attributes often associated with physical impairments. However, they experience significant difficulties with fine and/or gross motor skills. While their primary difficulties are physical in nature, they often experience problems in other developmental domains. I chose to give teachers a broad description, rather than the diagnostic criteria for DCD, to avoid as much influence as possible on teachers' perspectives. The last cluster of questions then concentrated on teachers' roles in addressing the perceived needs of children thought to have MD in physical education. Questions in this cluster included, "What have you done to address the concerns you have for children with MD?" and "What are some of the challenges you face in addressing concerns you have for children with MD in physical education?" The interviews lasted 19 to 34 minutes, with an average time of 24 minutes.

**Reflective field notes.** I recorded field notes after each interview to document my reflections on what the teacher said, changes that should be made to the interview guide, and preliminary thoughts about initial themes. These notes contributed to the creation of an audit trail to record and critique decisions made throughout the research process.

**Data Analysis**

I transcribed the audio-recorded interviews verbatim and removed all personal identifying information. Transcripts were numerically coded and pseudonyms replaced all names mentioned in the interviews to ensure anonymity. An electronic master list was created to organize interview transcript codes, participant names, contact information, pseudonyms, background information, length and location of interviews in a single file. I then analyzed the interview transcripts thematically. Interpretive description does not consist of a specific set of procedures for researchers to follow; it is a more pragmatic approach (Thorne, 2008). The researcher must

make informed choices that align with his or her epistemological stance, disciplinary agenda, and problem being investigated (Thorne, 2016). I chose to use Braun and Clarke's (2006) thematic analysis process because it is suited for different epistemological positions such as a constructionist perspective, can be data- versus theoretically-driven, and is useful for describing the perceptions and experiences of participants. Their process consists of six phases: (1) familiarizing oneself with the data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report.

I began the process by reading the interview transcripts multiple times to become familiar with the data. Ideas for semantic codes were noted in the left-hand margins. *Semantic codes* are words or phrases that describe content within the data that may be potentially relevant to the research questions, but stay close to the participants' meanings (Braun & Clarke, 2012). To understand the teachers' meanings, I asked myself questions such as: "How do teachers make sense of their experiences? What assumptions do they make in interpreting their experiences?" Once notes were recorded throughout the transcripts, initial codes were generated in the right-hand margins. Because the analytic process involves progression from description to interpretation, initial codes did not go beyond what teachers said and their use of language (Braun & Clarke, 2006). I worked systematically through the transcripts, giving full and equal attention to all data as much as possible, to identify relevant content that might form the basis for themes.[4] The same codes were applied across the transcripts where appropriate. A long list of codes was produced from the transcripts. Individual codes were organized in separate word documents, with their associated data extracts, to collate the data.

[4] When asked to describe children in their class who they thought had MD, two teachers talked about children diagnosed with autism and an additional two about children with physical impairments despite the explanation provided. Teachers' perceptions of and experiences with these children were not coded. However, their discussions about other children were.

Interpretive description requires the researcher to go beyond words and expressions to develop themes, which capture important elements that relate to the research questions and represent some level of patterned responses (Thorne, 2008). I grouped codes that shared some unifying feature together to create more meaningful and parsimonious units of analysis (Braun & Clarke, 2012). A thematic map was created to visually organize the themes and subthemes (i.e., themes within a theme). Relationships among the themes and subthemes were questioned during this phase by asking questions Thorne, Kirkham, and O'Flynn-Magee (2004) suggest such as: "Why is this here? Why not something else? And what does this mean?" Codes that did not fit well with the themes were discarded. The data extracts associated with each theme were then collated into word documents. Before moving on to the next phase of analysis, I met with my supervisor to discuss the thematic map. The goal of the meeting was to reach reasonable consensus, yet challenge alternative perspectives. After a set of themes was agreed upon, I reviewed them. All of the coded data extracts related to each theme were examined. Themes that did not have enough data to support them were eliminated, while themes that were similar were collapsed. I then went back and read all of the interview transcripts to refine the themes. During this phase, I had to determine if the thematic map accurately reflected the meanings within the data as a whole (Braun & Clarke, 2006). Additional data that related to the themes were coded. The thematic map was revised until I was satisfied with the coherence of the themes.

Through ongoing refinement of the analysis, I clearly defined what was unique about each theme and developed names from participant quotes. The collated data extracts for each theme were organized into logical and consistent accounts to identify their essence or what they were about (Braun & Clarke, 2006). How each theme related to one another, as well as the research questions, was considered to ensure there was not too much overlap between the themes.

I began to write narratives around the themes to inform readers of my interpretation of the data and its meaning. I had regular meetings with my supervisor to discuss the results. In interpretive description, findings represent what pieces of data mean individually and in relation to each other, and the variables that elucidate those relationships (Thorne, 2016). The final report captures the important elements of teachers' understanding of MD and their role in addressing the perceived needs of children with MD in physical education. Given that this is an exploratory study in which I worked inductively from what teachers said, the results are more descriptive. Relationships among themes are elaborated on in the discussion section.

**Evaluation Criteria and Strategies**

The evaluation of qualitative inquiry involves the use of criteria to judge the overall design of the study and the rigor with which it was conducted (Merriam, 2002). There are not specific criteria to evaluate interpretive description research since researchers must use data collection methods and analysis techniques suited to answer their research questions, but Thorne (2008) notes that all qualitative research with an interpretive approach is expected to demonstrate epistemological integrity, representative credibility, analytic logic, and interpretive authority. Epistemological integrity refers to consistency between the stated epistemological standpoint of the researcher and the research questions, as well as the interpretation of the data that follows logically from questions (Thorne, 2008). The research questions were generated out of practical concern so interpretive description was considered the most appropriate methodological framework to answer these questions and use the knowledge gained to improve pedagogical practices. A systematic data analysis process was selected (Braun & Clarke, 2006) to ensure the themes, and relationships among them, were illuminated and answered the research questions.

Representative credibility is demonstrated through thoughtful engagement with participants and the data. I communicated with teachers prior to the first interview to answer any questions they had about the study. The demographic questions in the interview guide helped me learn more about the teachers. After the interviews were completed and I transcribed the audio recordings, teachers were provided their transcript to check for accuracy of the data. A summary of the research results was emailed to teachers near the completion of the study to ensure my interpretation of the data was comprehensible and coherent. No changes to the results were suggested. Readers need to be able to understand how the researcher arrived at the study conclusions from his or her inevitable fore-structure (Thorne, 2008). Analytic logic was achieved through abundant detail and an audit trail. Details about relevant participant demographics and the context in which the interviews were conducted were presented in a table. The data analysis process was also thoroughly discussed to document how I worked from coding of the transcripts to writing the final report.

Interpretive authority requires the researcher to acknowledge his or her subjective role throughout the research process, including personal biases, assumptions, motivations, and theoretical perspectives that may influence the study topic, design, and data collection and analysis. My motivation to conduct this research came from my experience trying to recruit children at risk for DCD in elementary schools for my master's research. I initially asked generalist teachers to rate the abilities of all children in their class to learn and perform basic motor skills, or at the very least those who they thought demonstrated difficulties with fine and/or gross motor skills. Some teachers expressed not feeling confident in their ratings and others incorrectly identified children whom they thought were at risk for DCD. This was confirmed by subsequently administering a standardized motor test to children who were rated

poorly to determine if they met the inclusion criteria. This series of events prompted me to observe the movement performance of children in physical education classes to identify potential participants. During my observations, I noticed children thought to be at risk for DCD become easily frustrated and withdraw from or avoid activities. Some teachers indicated they were aware of these behaviours, but believed the children were disruptive, poor sports, or unable to follow instructions. The negative perceptions these teachers had of the children seemed to be reflected in their actions toward them; some teachers intentionally targeted "disruptive" children in a game of dodgeball or dismissed the views of children who were "poor sports." Before commencing this study, I reflected on how my professional background and personal characteristics might impact the engagement of teachers in the research activities. I thought teachers might view me as an expert in physical education and feel uncomfortable talking about their pedagogical practices. To increase teachers' comfort levels, I was available to answer questions they had about the study prior to participating. At the start of the interview, I emphasized that it was intended to be a conversation. I had prepared questions to learn about teachers' perspectives of and experiences with children with MD, but teachers could share additional experiences they felt were important at the end. However, I seemed to share language and a common professional base with some teachers that helped to build rapport. Throughout data collection and analysis, a reflexive journal was kept to document how my previous research experiences, background, and characteristics may have influenced the process. I met regularly with my supervisory committee members to discuss data collection and analysis, which helped me become further aware of my assumptions. Field notes were recorded following each interview and throughout the data analysis process to analyze and critique decisions made.

# Results

## "I Think It Can Be Different Things"

Teachers believed the underlying cause of MD could be attributed to two factors: an impairment or unhealthy lifestyle. Based on the children teachers referred to and described, six teachers attributed MD to a single cause – an impairment ($n = 4$) or unhealthy lifestyle ($n = 2$) - while the other half of teachers believed it could be the consequence of both. Teachers who spoke about children in their class who they believed had MD due to an undiagnosed impairment focused on the limitations children experienced as a result of it. Teachers discussed how children were unable to do certain types of movement because of their impairment, which in turn, they perceived to hinder children's full movement potential. For example, Jacqueline explained, "If they have special needs they can't physically move like the other kids, or can't walk properly, or can't run." Children with MD were often compared to other children in their class considered "typical." Teachers described their movements as being different and mentioned how they failed to perform normative motor skills that other children already mastered. When talking about a girl in his class who he suspected had an impairment that was effecting her movement, Brayden expressed "it's impacting her in a negative way because she's not getting that full developmental increase of where she should be for her age." Teachers thought that with more supports, particularly specialized services like occupational therapy for children in lower grade levels, children with MD were capable of improving their skills and experiencing greater success in physical education.

Teachers who talked about children in their class who they believed had MD due to an unhealthy lifestyle, on the other hand, discussed at length children's physical inactivity and sedentary behaviour. Teachers felt that children's home environment did not promote physical

activity and therefore they lacked essential childhood physical activity experiences. Karen indicated that children with MD were "kids that haven't been exposed to enough movement. They come to school, go home, and parents prop them in front of a video game. Movement difficulties come from just not moving." Although, some teachers also felt children's poor nutrition played a role. Lauren explained, "Nutritionally, I see what they bring for lunch and it's all sugary foods that kind of cause the tiredness and being lethargic and things like that so I think that also in turn affects their movement." Teachers often compared the physical activity behaviours of children with MD in their class with their own experiences growing up, acknowledging that norms have changed. Julia recalled:

> When I grew up, we had a lot of opportunity for free play and those were the things we would entertain ourselves with whether it was monkey bars, or jump rope, or swings, or the merry go round. It was all that and now you look at it. There's so much time spent in front of the screen.

Children today are not meeting physical activity guidelines and are more sedentary than they used to be, which some teachers associated with increases in overweight children in their class. However, teachers believed that if children adopted healthier habits that consisted of adequate physical activity, less screen time, and proper nutrition, children with MD were capable of catching up or being at a motor skill level appropriate for their chronological age.

**"It Encompasses a Lot"**

Teachers were aware of a range of difficulties children with MD experienced. The most common difficulties teachers reported were associated with the physical domain of development ($n$ = 12), followed by difficulties in the emotional ($n$ = 11), cognitive ($n$ = 9), and social domains ($n$ = 8). This trend in reported difficulties was also apparent in the concerns teachers had for

children with MD, where the highest concerns were expressed with regards to children's physical ($n$ = 12) and emotional well-being ($n$ = 9) and lowest concerns for their cognitive ($n$ = 6) and social well-being ($n$ = 2).

**Physical difficulties and concerns.** Teachers recognized that children with MD could experience difficulties with fine and/or gross motor skills. However, it was their gross motor difficulties that were most evident in physical education and of greatest concern. Teachers talked about how difficult it was for children with MD to perform basic movement skills such as running, kicking, throwing, and catching that came so naturally for most children. Teachers often used the words *awkward* and *uncoordinated* to describe the appearance of their movements and were confounded by the random and peculiar nature of the movements they observed. Carolyn explained, "She struggles not just in a physical education setting, but in here she's the one who will walk into a table, and fall off a chair, and trip on this floor when there's nothing there." Even activities like yoga that develop balance and stability skills were a struggle for some children. "They have a hard time bending, and moving, and holding those positions, and balancing, whereas the other kids don't have a hard time" (Natalie). Teachers largely attributed these difficulties to either a lack of ability or poor physical fitness. However, despite the reason, they were most concerned about children's physical competence. They worried that if children with MD did not master basic movement skills they would experience less success as the physical education curriculum became progressively harder and more complex with increasing grade level. They discussed the impact this could have on other areas of development, especially children's self-esteem. Jacqueline believed it was most important to address children's MD because difficulties in other domains would then be remedied.

> I think that if you're getting them at their level that will boost their confidence and help them be proud of themselves. From there you can springboard and move into the next stage that they are capable of doing. If these kids need to be walking, standing straight, hopping, or skipping, that's what you need to focus on. Hopefully that would help them become more confident and not worry about what everyone else is doing.

**Emotional difficulties and concerns.** Teachers were aware of the greatest breadth of difficulties children experienced in the emotional domain. The most prevalent difficulties teachers discussed were children's low self-confidence, reluctance to engage in activities, problems regulating their emotions, and lack of motivation. When Julia worked with a boy in her class to improve his jump rope technique, she was quickly met with resistance. "He started with, 'I'm not doing this, I'm never going to do this, I can't do this!'" Some children expressed to their teachers that certain skills and activities were difficult for them, while others tried to manage problems on their own. Teachers noticed when the latter children started to retreat from activities they were not skilled at or had a look of defeat on their face. Their emotions were described as being up and down. Sometimes they appeared fine, but other times they cried or became angry. Teachers believed some children with MD dreaded physical education because they had to participate in activities they knew they struggled with. Consequently, many children attempted to avoid particular activities or physical education altogether. Natalie explained:

> They don't want to participate in Phys Ed. They want to sit on the benches. They make any excuse to not be in Phys Ed - asking to go to the bathroom a million times or asking to get a drink. They try to avoid it at any cost.

In addition to avoidance, teachers touched on other coping strategies children used in difficult situations including humour to protect their self-esteem, withdrawal to prevent embarrassment, and victim playing to seek attention.

> If we asked him to catch a ball, it would be very delayed. He would have his arms out and open. Then we would throw the ball and it would hit him and he would close his hands. Then he would be silly because he would try to cover up that he didn't know how to do those kinds of things. (Jacqueline)

Teachers were most concerned about children's overall self-esteem and confidence to participate in physical education. Teachers of lower grade levels believed that children with MD would avoid activities in physical education when the discrepancy in their skills, relative to others, increased. They also thought unsuccessful experiences in physical education might lead to learned helplessness over time in which children give up easily when confronted with difficult activities because they believe failure is inevitable.

**Cognitive difficulties and concerns.** Several teachers indicated children with MD did not understand what to do when given verbal instructions and how to make their bodies move in certain ways. They believed their brain was unable to process the information or they required more thorough instructions. Karen said, "You can see them trying to do it, but just that whole if you say kick, not sure where to put the planted foot, not sure where to start the kick and end the kick." Teachers of higher grade levels thought children were hyperaware of their skills for their age and recognized that they were unable to keep up with everyone else. Kurt felt that children with MD might perceive physical education differently than others because they are not as physically capable and thus, more concerned about their difficulties being publicly exposed.

Children with MD in lower grade levels, though, had not yet recognized how they fared compared to others and were therefore less effected, according to teachers.

Two teachers acknowledged that children's interests in activities may have contributed to their (un)willingness to participate in physical education. Natalie said:

> We kind of cover everything and it's not always in the form of games. It's just body movements and skills so it could just be that they're not interested. They would rather just play basketball all day [laugh]. We can't do that in Phys Ed class. We have to reach all the students and be able to develop all their skills and then maybe they can learn what they enjoy doing.

Teachers were concerned that children with MD would become disheartened to physical education and physical activity as they got older, resulting in negative perceptions and poor motivation for their participation. David said, "If a student doesn't have a good experience in physical education, then they are never going to want to participate in Phys Ed." When physical education is no longer mandatory, teachers thought children with MD would choose not to take it and refrain from trying out for sports teams in high school.

**Social difficulties and concerns.** Teachers most commonly reported that children experienced difficulties in forming relationships with their classmates. Many children were reserved and often struggled to find a partner for cooperative activities or a group to play with during free time in physical education. Some even clung to the teacher because they preferred to participate in activities with them over other children. Jacqueline explained, "He always kind of depended on the adults so he wouldn't really connect with any of the kids. If we said go play with the other children, he would say, 'But I want to stay with you.'" Classmates sometimes excluded children with MD from activities, which made them feel upset. Lauren recalled:

> They do have problems where they'll say, "They're not including me or nobody wants to play with me." Especially with the one boy in particular, he gets isolated because he can't keep up with everybody else so he's always the last one to find a partner.

Teachers felt that children's lack of friendships may have contributed to their reluctance to engage in activities. Leslie believed that children who felt discomfort in group settings did not experience a sense of belonging. Teachers were concerned about the rejection and ridicule children with MD experienced and how it might become worse with age. They thought children with MD in higher grade levels might find it particularly difficult to interact with others when close friendships have already been established and the physical education curriculum includes more competitive games. Julia had already begun to notice these concerns among children in Grade 1. "You already see that they're like I don't want them on my team and I don't want them with me. [It's] so crushing."

**"I Try to Make it a Positive Experience"**

Given the widespread difficulties observed among children with MD, all teachers thought their overarching role was to facilitate positive experiences for them in physical education. They discussed three different ways in which this could be achieved. Nearly all teachers believed increasing children's success would result in positive experiences ($n$ = 11), followed by fostering their interest in and enjoyment of physical education ($n$ = 5) and creating an inclusive environment ($n$ = 5).

**Increasing success.** Teachers felt they were responsible for finding ways to facilitate growth in children with MD, no matter how big or small, and collectively reported 16 different strategies they used. The most common strategies included delivering structured lessons ($n$ = 11), adapting tasks ($n$ = 8), providing one-on-one support ($n$ = 7), requesting support from specialized

professionals ($n$ = 7), seeking advice from colleagues ($n$ = 7), and breaking skills and activities down ($n$ = 6). Almost all teachers planned lessons that followed a routine. They started the lesson with a warm-up and then moved into teaching specific skills and concepts. Children were then provided time to practice these skills, or engage in activities to learn the concepts, before applying them and ending with a cool down. Kayla expressed "I think Phys Ed class worked better when we had more structure [and] more clear objectives we were trying to accomplish." Most teachers tried to plan lessons that accommodated the various ability levels of children in their class, including those with MD, but made adaptations when children struggled. They often altered the task goal to make individual activities easier for them or the equipment they were using. Brayden said:

> I know especially when it comes to anything coming towards her, whether it's on the ground or through the air, her first instinct is to turn or to cover and protect herself. If we do basketball, we will alter to something a little larger so she doesn't have to have as [good] fine motor skills for catching or as good hand-eye [coordination].

Other times, teachers worked one-on-one with children to help them understand how to perform the skill and offer feedback to improve their performance. Kurt supported a child with MD when he was unable to serve a birdie over the net. He explained:

> A lot of the kids were picking it up quickly and I said, "Can I be your partner and I'll show you?" and he's like "Yeah." He's like, "Well how do you hit it?" I talked to him about moving his hands up and then just dropping the birdie and he finally got it.

Teachers of lower grade levels thought it was effective to break skills down into their most basic parts. "Sometimes we don't necessarily realize how far back we have to break things down. Things that we think are very easy still need to be broken down further" (Carolyn). A skill as

simple as walking on a line, for example, was taught as one foot in front of the other with a wall within reach for support. Teachers of higher grade levels used this same strategy when teaching children more complex skills such as throwing a football.

Teachers did their best to increase experiences of success for children with MD in physical education, but recognized when help was needed. They requested support from specialized professionals, mainly occupational therapists and consultants, when their strategies were ineffective and they were unsure what to do. Teachers found this support beneficial because the therapists and consultants were able to identify additional difficulties that went unnoticed, provide different perspectives on the source of children's difficulties, and equip teachers with new strategies. However, when wait times for these professionals to visit were long or children's difficulties were not considered major concerns, teachers turned to their colleagues with more experience or expertise in physical education for advice. Their colleagues often gave them resources and new ideas. Sometimes they were even able to provide more background information about particular children they taught previously and strategies they used that they believed were effective.

**Fostering interest in and enjoyment of physical education.** Teachers believed it was their responsibility to develop children's interest in and enjoyment of physical education, or at the very least, willingness to try activities to discover their preferences. Strategies teachers used included being a role model ($n$ = 4), encouraging children to persevere ($n$ = 4), supporting their needs and desires ($n$ = 3), and acknowledging their perspectives ($n$ = 2). All teachers valued physical education, but teachers who identified as "sporty" or "athletic" often participated in activities with the children in order to be viewed as a positive role model. They thought children would be more inclined to participate if they were engaged. Only one teacher, though, was

cognizant that his participation could have the opposite effect. Brayden was aware that children with MD might become discouraged if they saw him perform skills with ease. Because of this, he would ask children to demonstrate skills for the class and emphasized that making mistakes is okay. Julia demonstrated skills herself, but deliberately made errors from time to time to teach the children that mistakes are part of the learning process. She explained:

> Every time I make a mistake, I'm like "Boys and girls did you just see what I did? I just made a mistake. Did anything happen?" And they're like "No." I say, "Did the world end? No, so it's okay to make mistakes. That's what we're here for."

Teachers believed the most important thing was to encourage children with MD to try their best and not give up if they experienced failure. However, this required learning about the children's needs and goals to ensure they were not pushed too far. Kayla said: "I think it's a very fine line going from encouraging to pushing too hard or too fast. Everyone is an individual and responds differently." Teachers also tried to understand children's perspectives by putting themselves in their shoes. When children with MD were not enthusiastic about activities, teachers reflected on why that might be to rationalize their feelings. Some teachers who knew children were uncomfortable with certain activities allowed them to not participate or assigned them another activity. Natalie provided an alternative option for a girl who did not enjoy everybody's it tag.

> I tell her that she has to walk the perimeter. It's okay that she's not participating, but we still need to be moving. A lot of times I'll walk with her so she's not alone and make her feel comfortable in that way.

On the other hand, Chelsea provided opportunities for children in her class to contribute to activity decisions. During their gymnastics unit, she said "We built stations all around the gym

that the kids came up with. They worked on balance skills, rolling skills, different locomotor skills, and they loved it."

**Creating an inclusive environment.** Teachers believed it was their responsibility to ensure children with MD felt included in physical education. Strategies teachers used involved fostering a supportive classroom climate ($n$ = 5), planning individual and cooperative activities ($n$ = 4), and facilitating peer interactions ($n$ = 2). Teachers thought it was important to create a safe space for children where they would not retreat. This often necessitated communicating expectations with the entire class. Julia and Karen, who were teachers of lower grade levels, encouraged children to celebrate others' successes but not ridicule them for their failures. They tried to impart on the children that everyone was successful in their own way and they did not have to be as good as someone else. This same sentiment was expressed by teachers of higher grade levels. Chelsea said:

> Right from day one in my classroom, I make it clear that we are a community of learners. Everybody's at a different level so let's be cognizant of that and let's work together to grow. …Instilling that value of [taking] everybody's concern into consideration…took way more work than planning a lesson.

At the beginning of the school year, teachers spent a significant amount of time on individual and cooperative activities to encourage positive interactions among children. Several teachers perceived these experiences as some of the most successful for many reasons. David explained:

> I play a game called cross the pond where you try to get the kids to work from one end of the gym to the other end using communication [and] cooperation. …You can put kids that you never think will work together…and they end up working the best. It doesn't

matter their physical skill set. Just because you aren't athletic or love Phys Ed, you can still participate.

When children started to become competitive in these activities, teachers reminded them that they are all at different skills levels and everyone is important. Natalie said, "This group is very hard to teach. They're very competitive in their learning. When I see them cooperate and actually understand that they need to work as a team, that's when I know I did my job." However, children with MD were still reluctant at times to participate or were excluded from activities. Teachers would first partner up with the children to build their confidence before assigning them a different partner. Other times, they would find one or two children in the class who were more accepting to partner with these children so they had a better experience.

**"I Am Like a Jack of All Trades, Master of None"**

Teachers spoke about the challenges they experienced as a generalist responsible for addressing the needs of all children across different curricular areas. Most teachers found physical education, in particular, quite difficult. Although, four teachers felt they experienced very few or no challenges at all in facilitating positive experiences for children with MD in physical education.

**It is not my specialty.** The majority of teachers were quick to acknowledge that physical education was not their specialty ($n$ = 8). One teacher even admitted that it was her least favourite subject to teach. Lauren said, "This is not my forte so I struggle with that. I kind of almost wish they could have a better Phys Ed teacher because that could provide them with a little bit more." These teachers lacked confidence in their abilities to teach physical education and found it difficult to get through the curriculum. On average they had access to the gym three days a week for 30 minutes, and as a result, thought the units were not adequately covered. They

were concerned that children were not getting what they needed out of the subject. The short time blocks also made it difficult for teachers to effectively identify and address children's needs. Some teachers started to become concerned about the amount of time they spent with children with MD relative to others, and questioned if all children's needs were being met. Julia explained: "I usually tend to go to those who need the most help, but then I think about the ones who didn't really need help. Did I push them to be stronger today?"

Teachers recognized they had more to learn and could benefit from additional resources and educational opportunities. Teachers thought more adaptive materials and equipment would better enable them to increase children's success, as well as resources that outlined ways for them to develop self-esteem and physical competence in children. Several teachers thought more professional development would be valuable, particularly if it covered specific topics. Teachers believed sessions that focused on effective strategies to identify and address the needs of children with specific impairments, activities to meet grade specific outcomes, and hands-on versus classroom-based training would increase their knowledge and skills the most. They also thought more impairment specific and hands-on training during their post-secondary education would have been beneficial. Chelsea said:

> I don't remember a single time where we were taught okay if you have a student like this, this is how you can meet their needs. It would have been way more successful and effective to teach us these are some of the things you'll walk into, some of the students that will cross your path, and these are things to help them the most.

Teachers indicated greater field experiences, aside from their practicum, would have helped them understand how to deliver the curriculum better and work with children of different skills levels. However, many ultimately felt that physical education specialists were needed in schools. Karen

explained, “I think if we don’t start at the elementary level with people who are trained properly and confident themselves to teach, [children with MD] will continue to just be wallflowers and won’t take Phys Ed in high school.”

**I should not be expected to do it all.** Although all teachers believed it was their role to facilitate positive experiences for children with MD in physical education, most felt they should not be solely responsible for children’s outcomes ($n$ = 8). Teachers thought children would experience greater physical success with increased support from other school personnel and physical activity opportunities outside of school. During physical education classes, most teachers did not have support from an educational assistant, occupational therapist, or consultant. While teachers of higher grade levels typically did not perceive this as a detriment, teachers of lower grade levels did. They advocated for more services to support children with MD, which at times proved difficult because of long wait times and lack of urgency on the part of professionals. Julia explained:

> Our OT is overwhelmed with how many schools she works with…but when I call, it’s for a reason. Not just because I felt like filling [her] day. I really notice a problem here and to have it brushed off was kind of frustrating. I just pushed again and was like, “No, I want a full assessment.”

Teachers felt it was the responsibility of professionals to take their concerns more seriously, and the responsibility of the district to ensure there was adequate access to specialized services.

Teachers also thought the amount of time allotted for physical education was a barrier to addressing the needs of children with MD. They expressed that leadership in schools and the district must prioritize physical education and parents needed to step up. Kayla believed she

could not significantly help children with MD improve their physical skills in three physical education classes for 30 minutes a week. She said:

> Is that enough time to increase their physical ability? We can practice and give them skills, and strategies, and ideas, but I think it's so important that that stuff also gets carried on at home as well to make a large improvement.

Some teachers struggled to motivate children with MD to participate in physical education due to perceived inconsistencies between school and home. Teachers tried to instil the value of an active and healthy lifestyle in children, but believed their home environment did not promote such values. They thought parents should take greater responsibility for their children's health, as they believed the development of healthy habits started at home. However, they felt parents should be more receptive to the feedback they provided on children's progress at school and recommendations to increase their success. Chelsea said:

> It can be very difficult to get them on board sometimes whether it be my child isn't capable of doing those things versus my child can do it, I know they can, even though they are more restricted than the parent likes to admit. You have two extremes and need them to be on the same page as you and trust you that you know that their child can't do it right now, but with a little bit of differentiation or whatever it is they need, they will be on the right path to get there.

If all involved shared a common vision and worked together, teachers thought children with MD would experience physical education more positively. David thought it was his, and his fellow teachers' responsibility, to lead the way.

I think it's the job of the teacher to work with the whole community of parents, the school, the district to make sure physical education is a place where kids can feel safe and also grow with their passion and interests.

## Discussion

Elementary generalist teachers play a significant role in shaping the experiences of children with DCD at school, including physical education. Children at risk for DCD who perceive their innate psychological needs to be supported by their teacher often view stressful situations in physical education as a challenge, whereas children who are inadequately supported perceive these situations as a threat (Zimmer & Causgrove Dunn, 2019). This study aimed to explore elementary generalist teachers' perspectives of and experiences with children thought to be at risk for DCD to determine areas where additional training is needed to support children's innate psychological needs, increase their engagement, and promote positive outcomes. The term *DCD* will be used in this section to interpret teachers' perspectives and the phrase *thought to be at risk for DCD* to discuss their experiences with children. The results of this study illustrated that teachers have two different views on the etiology of DCD – one biological (impairment) and the other environmental (unhealthy lifestyle). In recent years, researchers have challenged a strictly medical model definition of DCD because it does not acknowledge environmental factors that impact children's functioning in their daily lives (e.g., Ferguson, Jelsma, Versfeld, & Smits-Engelsman, 2014; Whittal & Clark, 2016). Although one study in particular found there are specific genes and/or gene networks involved in the development and function of neural circuits associated with DCD, providing support for a genetic basis of the disorder (Mosca et al., 2016), Dewey and Bernier (2016) have called for investigation into environmental mechanisms such as movement experiences and nutrition. Interestingly, several teachers believed these same lifestyle

factors were potential causes of DCD. Though this may be related to increased awareness of physical inactivity levels, sedentary behaviour, and rates of obesity among children, as well as the focus of some public health interventions, this finding warrants further attention. Researchers should attempt to uncover why teachers hold these views as the way they conceptualize DCD can have implications for children's engagement in physical education (Haslett & Smith, 2019).

Despite what teachers believed to be the cause of DCD, they were aware of difficulties children experienced that spanned all domains of development. Many of these difficulties overlapped with the common features identified by teachers in Wilson et al.'s (2013) study, with poor gross motor skills, physical fitness, and low self-esteem being the most commonly recognized and information processing challenges and poor social skills being the least recognized. Teachers of lower grade levels, in the current study, tended to report more difficulties and concerns than teachers of higher grade levels. They believed it was important to prevent negative consequences early on and felt it was their role to ensure children received appropriate supports to remediate their difficulties. While the age of the children may have influenced their perceptions, specialized services were primarily provided for children in lower grade levels in the school districts in which this research was conducted. Greater concern about children not achieving milestones typical for their chronological age was expressed by teachers of higher grade levels who attributed DCD to an undiagnosed impairment, compared to teachers of lower grade levels with the same perceptions. Again, the school districts prioritizing specialized services for younger children may explain the discrepancy, although the difficulties older children demonstrated may have been more obvious to teachers because their gap in skills relative to other children may have been larger (Wall, 2004). The physical education curriculum is also more advanced for older children and teachers may have had greater expectations of them.

Teachers who attributed DCD to an unhealthy lifestyle did not express the same level of concern around normative development as teachers with differing views from them. These teachers seemed to believe lifestyle factors were more amenable to change and therefore, thought these children could meet grade level expectations and outcomes if their home environment encouraged them to adopt healthy habits.

Given that the central goal of physical education is to develop physical competence and the hallmark of DCD is functional problems with fine and/or gross motor skills, it is not surprising that almost all teachers thought it was their responsibility to increase children's success. Teachers more likely to create an inclusive environment though were those who discussed social difficulties and concerns. Similarly, teachers who noticed children's reluctance to participate and avoidant behaviour were more likely to develop their interest in and enjoyment of physical education. However, the latter teachers also embodied an active lifestyle or stated they did not want children thought to be at risk for DCD to be like them when they got older. David was the only teacher whose discussion of responsibilities corresponded with all three. Teachers with the most teaching experience or knowledge of physical education experienced few, if any, challenges in fulfilling these responsibilities and thought they were solely responsible for children's outcomes, complementing previous research (Kowalski, & Rizzo, 1996; Obrusnikova, 2008; Rizzo & Kirkendall, 1995). In contrast, teachers with fewer years of experience and who completed minimal physical education courses during their post-secondary education believed the whole school community and parents should be responsible for children's outcomes as well. Teachers who attributed DCD to a suspected impairment felt specialized professionals in particular should be more involved, whereas teachers who attributed DCD to an unhealthy lifestyle thought parents should contribute more. While no teachers seemed to have negative

attitudes toward instructing children thought to be at risk for DCD in physical education, the outcomes they thought children were able to obtain differed based on the cause of their DCD and their own confidence and competence teaching.

A staged approach to service delivery has been recommended to more efficiently address the needs of children with DCD (Camden, Wilson, Kirby, Sugden, & Missiuna, 2015; Missiuna et al., 2012). Intervention is to begin at the population level by creating environments that foster the development of functional motor skills and participation of all children (Missiuna, Polatajko, & Pollock, 2015). Occupational therapists work with teachers to build their capacity to identify and manage the needs of children with DCD, and only children who do not respond well are then referred to specialized professionals for one-on-one services. This model has been implemented in elementary schools in Ontario. Evidence thus far shows that when teachers were able to create a positive learning environment, many children with DCD experienced success (Missiuna et al., 2015; Missiuna et al., 2012). Such training for elementary generalist teachers seems to better enable them to address the activity limitations and participation restrictions of children with DCD. However, more training is needed to support children's basic psychological needs for relatedness and autonomy, which appear to be overlooked. Experiences of stress in physical education for children at risk for DCD are characterized by more than difficult activities. They include negative interactions with peers that result in rejection, injury, and ridicule and pressure to meet the teacher's demands and expectations (Zimmer & Causgrove Dunn, 2019). In order to foster optimal functioning and well-being among these children, all three needs must be supported (Ryan & Deci, 2017).

## Limitations

There are some limitations that should be acknowledged. First, this research topic may have impacted teachers' openness to share certain perspectives and experiences. I tried to minimize the potential for teachers to feel evaluated by developing open-ended questions, stating at the start that the interview was intended to be a conversation, and allowing them to provide additional information they thought would be useful upon completion of the interview. Second, I provided teachers with a description of MD during the interview after they had an opportunity to convey their understanding of the term. Although the description was meant to focus teachers' responses on children in their class who fit the description, it is not known whether the children they talked about are at risk for DCD. Lastly, recruitment of participants was successful when interviews were scheduled with teachers during the school day, but time was restricted because interviews had to be completed in a single period.

## Conclusion

Teachers play an integral role in how children with DCD experience physical education since they control the learning environment through planning and delivering lessons, cultivating the classroom climate, and monitoring learning and achievement. Teachers who create supportive conditions can foster greater engagement among children and positively contribute to their holistic well-being. However, many teachers are unfamiliar with DCD and lack training to properly support these children, according to previous research. This study explored the relationship between elementary generalist teachers' understanding of DCD and their role in addressing the perceived needs of children thought to be at risk for DCD in physical education to identify areas where additional training is needed.

Teachers believed DCD was caused by an impairment and/or unhealthy lifestyle. Their perception of the etiology of DCD seemed to primarily influence their concerns around children's normative development, beliefs about their physical education attainment, and views about who should be responsible for assisting these children to improve their outcomes. Regardless of the perceived cause of DCD, many teachers found it difficult to ensure children had a positive experience. The strategies teachers used to facilitate positive experiences were influenced by their perceptions of children's difficulties and concerns to some extent. Nearly all teachers focused their efforts on building children's confidence and competence, with few teachers creating an inclusive environment or fostering children's interest in and enjoyment of physical education. More training for teachers is required to support children's innate psychological needs for relatedness and autonomy. Future research should further investigate the pedagogical practices of elementary generalist teachers and how certain strategies prevent or mitigate experiences of stress in physical education for children with DCD. Skinner and Wellborn's (1994) theory of stress and coping, which draws on self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2017), could be used as it focuses on social contextual factors that support or thwart children's basic psychological needs. Moreover, post-secondary education courses and professional development sessions should focus on increasing teachers' knowledge and abilities to address children's three needs, with greater emphasis on ways to support relatedness and autonomy, which would benefit *all* children.

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Table 4-1

*Demographic Information of Elementary Generalist Teachers*

| Pseudonym | Gender | Current Grade Level | Years of Teaching Experience | Number of PE Courses Taken | Interview Location |
|---|---|---|---|---|---|
| Jacqueline | Female | K | 14 | 1 | School |
| Kayla | Female | 1 | 2.5 | 0 | School |
| Carolyn | Female | 1 | 19 | 2 | School |
| Julia | Female | 1 | 15 | 1 | School |
| Lauren | Female | 2 | 7 | 1 | School |
| Karen | Female | 2 | 8 | 20 | School |
| Leslie | Female | 3 | 20 | 3 | Home |
| Brayden | Male | 4 | 4 | 7 | School |
| Kurt | Male | 5 | 3 | 12 | School |
| Natalie | Female | 5/6 | 5 | 2 | School |
| Chelsea | Female | 6 | 5 | 4 | Other |
| David | Male | 6 | 4 | 20 | School |

*Note.* PE = physical education

# CHAPTER 5

# Conclusion

Psychological stress is a phenomenon that seems to be experienced by many children with developmental coordination disorder (DCD) in physical activity contexts at school (Barnett, Dawes, & Wilmut, 2013; Lingam, Novak, Emond, & Coad, 2014; Payne, Ward, Turner, Taylor, & Bark, 2013; Zwicker, Suto, Harris, Vlasakova, & Missiuna, 2018), particularly physical education (Fitzpatrick & Watkinson, 2003; Missiuna, Moll, King, Stewart, & Macdonald, 2008), due to the emphasis on children's motor abilities and skills. Physical education is part of the core curriculum in elementary schools and is intended to foster the knowledge, skills, and attitudes necessary for children to lead an active, healthy lifestyle (Physical and Health Education Canada, 2018). Persistent problems experienced in this context will negatively impact children's functioning and well-being unless they learn to cope with stress in adaptive ways. Teachers can help guide children with DCD through stressful experiences to build their coping repertoire, as well as enable them to flourish through the use of supportive pedagogical practices. However, most teachers have reported that they are unaware of who these children are (Wilson, Neil, Kamps, & Babcock, 2013) and lack adequate training to support them (Jasmin, Tétreault, & Joly, 2014). Children thought to demonstrate characteristics associated with DCD were the focus of this thesis research since the disorder is unfamiliar in the education system (Missiuna, Moll, King, King, & Law, 2007; Missiuna, Moll, Law, King, & King, 2006). Children were referred to as at risk for DCD, unless otherwise specified.

The purpose of the first study was to explore the lived experiences of children at risk for DCD in physical education in order to develop a deeper understanding about what they experience as stress and how they cope with it. Skinner and Wellborn's (1994) stress and coping theory provided greater insight into personal and environmental factors that contributed to these experiences. Interviews were conducted with children to learn about people and events in the

social context that thwarted their basic psychological needs for relatedness, competence, and autonomy, resulting in appraisals of stress and coping responses. Sources of stress for children consisted of psychological and physical harm caused by peers, difficulties encountered in performing activities, and pressure to meet the teacher's demands. The results complemented previous qualitative research from children's perspectives. They are often teased (Barnett et al., 2013) and excluded by peers at school (Payne et al., 2013), as well as struggle to participate in competitive games and sports (Lingam et al., 2014; Zwicker et al., 2018). Children coped more adaptively in response to stressors that impinged on their needs for relatedness and competence than autonomy. Social support, primarily from the teacher, seemed to influence how well children coped. It is important that teachers provide quality opportunities for children at risk for DCD to develop personal skills (e.g., self-efficacy, intrinsic motivation) and social resources (e.g., relationships) as growth and resiliency can occur from adapting well to adverse situations (Zimmer-Gembeck & Skinner, 2016).

The purpose of the second study was to explore elementary generalist teachers' perspectives of and experiences with children thought to be at risk for DCD in physical education to determine areas where additional training is needed to support children's innate psychological needs, increase their engagement, and promote positive outcomes. Children were referred to as having movement difficulties (MD) since the term reflects functional problems with fine and/or gross motor skills that are visible to others, but does not suggest a medical condition is present. This label was thought to limit influence on teachers' perspectives. Teachers believed DCD was the consequence of an impairment and/or unhealthy lifestyle. They were aware of numerous difficulties children experienced across all developmental domains, many of which were consistent with the literature (Wilson, et al., 2013). While the difficulties observed

and discussed did not seem to be influenced by their perceptions of DCD, the concerns they had for children were. Teachers who attributed DCD to an undiagnosed impairment were concerned about children not achieving grade level expectations and outcomes without specialized services such as occupational therapy. Teachers who attributed DCD to an unhealthy lifestyle were less concerned about children's normative development. They seemed to believe lifestyle factors were more susceptible to change and children could meet grade level standards if their home environment encouraged them to be more physically active and consume healthy foods. Regardless of their perspective, teachers thought their primary role was to ensure children had a positive experience in physical education. To achieve this, they implemented strategies that generally supported one or two of children's needs for relatedness, competence, and autonomy, with the strategies they used appearing to align with the difficulties they noticed and concerns they had for children.

Stress may be inevitable for children with DCD in physical education because of their motor impairment; however, challenges can serve as building blocks for healthy development. The goal is to prevent children from becoming overwhelmed by stress (Skinner & Wellborn, 1997). The collective results illustrate that teachers have varied perspectives of DCD, but try to mitigate sources of stress for children in physical education. Teachers largely spoke about their efforts to increase success among children and advocate for greater support from specialized professionals and parents to improve their outcomes. There was little mention about their attempts to fulfil children's needs for relatedness and autonomy. Given that social support seems to mediate how well children with DCD cope with stress (Wilson, Piek, & Kane, 2013), teachers must first and foremost develop relationships with these children. They should learn about children's interests and goals, as well as take into account their perspectives as they prepare

lessons, deliver the curriculum, and evaluate their performance. Teachers should also aim to create an inclusive environment in order for children to experience a sense of belonging and feel significant among others. Further, autonomy support is critical since it can disrupt satisfaction of the other needs (Ryan & Deci, 2017). Children at risk for DCD coped the most poorly with stressors that interfered with the fulfillment of their need for autonomy. They perceived certain teacher behaviours as controlling and refrained from expressing their views to avoid punishment. According to Ryan and Deci (2017), children are more likely to participate with interest and enthusiasm when they perceive their behaviours to be self-endorsed and congruent with their interests and values. Optimal functioning and well-being will be experienced by children at risk for DCD when all three needs are met.

## Future Directions

There are now increasing ways to conceptualize *disability*, which makes it important for researchers to disclose their viewpoint (Haslett & Smith, 2019; Peers, Spencer-Cavaliere, & Eales, 2014; Withers, 2012). The biopsychosocial model of disability (World Health Organization, 2001) informed this thesis research because it allowed me to explore personal and environmental factors that contributed to experiences of psychological stress in physical education for children at risk for DCD. As knowledge of DCD increases, more researchers are using this model to better understand contextual factors that contribute to motor impairment and impact the activity limitations and participation restrictions children experience. One of the primary challenges with conducting such research, however, is identifying children with the disorder. Haegele, Lee, and Porretta (2015) examined trends in research published in the *Adapted Physical Activity Quarterly*, the official journal of our field, over a 10-year span. The authors found there was a movement towards research on issues affecting people with specific

impairments, as opposed to various impairments, in recent years compared to previous decades. The breakdown of impairment categories showed that more research on DCD, in particular, was being published in the journal due to growing international interest.

Researchers have advocated for decades for increased rigor in identifying children with DCD for inclusion in research to advance our understanding of the disorder. Because the biopsychosocial model centers on problems within the body and is medically grounded, it necessitates certain methods and procedures to not only detect motor impairment among children, but also specify the type and severity of impairment to compare and generalize results of studies. It is currently recommended that researchers (Schoemaker & Wilson, 2015) and healthcare professionals (Blank et al., 2019) use a multiple assessment process to ascertain children demonstrate all symptoms associated with a diagnosis of DCD. A two-stage approach developed for field-based research (Missiuna et al., 2011) was used in the first study to identify the full spectrum of children with motor impairment, and who were considered at risk for DCD, by obtaining information about all four diagnostic criteria. However, researchers should consider alternative ways to recruit children and learn about contextual factors impacting their experiences in light of increasing conceptualizations of disability. A shift in how disability is viewed will enable researchers to understand DCD at individual, social, and cultural levels. The use of other models of disability will also allow researchers to challenge dominant practices in physical education and teacher education.

Scholars have conceptualized models of disability that are more responsive to context and culture such as the social relational model (Thomas, 2004a,b). Unlike the biopsychosocial model which views disability as a physical disadvantage in performing normative activities and roles made worse by contextual factors, the social relational model views disability as the oppression

people face due to biomedical (e.g., impairment effects) and social factors (e.g., relationship with social structures and human beings; Dalkilic & Vadeboncoeur, 2016). Impairment directly impacts a person's embodied functioning in the social world. But, disability does not simply arise from impairment as in the biopsychosocial model; rather, social factors determine whether impairment will lead to disablement or restrictions in life activities, aspirations, and well-being. Social factors encompass both social structures - the organization of social institutions and their relationships - and human beings - attitudes and behaviours of people in society. First, people can be excluded from opportunities, activities, and services because of social structures and feel humiliated or disrespected (Haslett & Smith, 2019). Certain services and supports offered within educational institutions, for example, are often restricted to children with diagnosed medical conditions (Haegele & Hodge, 2016). Because the motor difficulties of children who experience DCD[5] are often trivialized since they are not as severe as those of other children (Mandich, Polatajko, & Rodger, 2003), they can be denied access to additional services and supports. Children who experience DCD may then be subsequently excluded from activities in physical education as the curriculum focuses on culturally relevant motor skills deemed necessary to be active for life. Second, people can encounter negative social interactions with others that are hurtful, hostile, or inappropriate and result in emotional distress. Children who experience DCD feel the reactions of teachers and peers to their poor motor coordination are unsupportive and hurtful (Barnett et al., 2013; Fitzpatrick & Watkinson, 2003; Missiuna et al., 2008). Some children also believe that their peers inflict intentional harm on them in physical education, evoking experiences of psychological stress (Zimmer & Causgrove Dunn, 2019).

[5] The phrase *children who experience DCD* acknowledges variations in embodied sensations, social structures, cultural understandings, and identities related to disability (Peers, Spencer-Cavaliere, & Eales, 2014).

In addition to social oppression, people can experience internalized oppression from living in a culture that views disability negatively, leading to low self-worth and intrinsic value (Haslett & Smith, 2019). Athletic competence is an attribute that is highly valued in Western culture and cultivated in physical education. Researchers have found children who experience DCD rate their general self-worth and athletic competence lower than peers (Piek & Rigoli, 2015). People who have internalized ableist norms, such as being able to perform particular motor skills proficiently in physical education, may conceal their impairment to avoid negative reactions from others, which is a behaviour demonstrated by these children (Fitzpatrick & Watkinson, 2003; Segal, Mandich, Polatajko, & Cook, 2002). Since these social factors undermine people's psycho-emotional well-being, it may cause children who experience DCD to avoid physical education, which limits not only what they can do but what they can become (Haslett & Smith, 2019). A social relational model would therefore be useful to better understand DCD and experiences of psychological stress in physical education. It enables researchers to (a) understand that impairment effects extend beyond restrictions caused by the body, harming psycho-emotional well-being, as the term is socially-constructed and culturally-specific, (b) acknowledge that impairments limit daily functioning, but prioritize social factors that lead to oppression, and (c) distinguish between restrictions children experience in physical education due to impairment effects and socially imposed factors that are either "barriers to doing" or "barriers to being" (Haslett & Smith, 2019). Researchers might recruit children who self-identify with these disability experiences in physical education (Peers et al., 2014) or have the children's parents assist them in determining their eligibility to participate.

How disability is conceptualized in physical education will have an impact on the pedagogical practices of teachers. As was evident in the second study, how teachers understood

MD influenced the concerns they had for children, beliefs around their physical education attainment, strategies they used to facilitate positive experiences, and the type of supports they thought would improve their outcomes. In their review, Camden, Wilson, Kirby, Sugden, and Missiuna (2015) recommend teachers be provided training to ensure accurate identification of children with DCD and referrals if warranted, as well as training to efficiently address their needs. Training programs created for teachers seem to focus on increasing their understanding of DCD based on the diagnostic criteria, identification of children who demonstrate clinical characteristics (Kourtessis et al., 2008), and management of the disorder through increased knowledge of typical motor development and promotion of motor skills through general curriculum-based activities (Missiuna, Polatajko, & Pollock, 2015). Given that DCD is an often unfamiliar and under recognized disorder, there is a unique opportunity for researchers to investigate how training programs that conceptualize DCD in various ways influence how teachers perceive and engage them in physical education.

Post-secondary educators should blend knowledge from adapted physical activity and critical pedagogy to nurture the pedagogic sensibilities of pre-service teachers (Connolly & Harvey, 2018). The purpose of adapted physical activity is to enable professionals to interact with children who experience disability (Standal, 2014) by understanding what it is like for them to experience movement and movement contexts (Goodwin & Watkinson, 2000). However critical pedagogy (Freire, 1970), an application of critical social theory, interrogates socially constructed and taken-for-granted assumptions inherent in dominant discourses and practices such as ableism and hegemonic normalcy. Connolly and Harvey (2018) believe an interdisciplinary dialogue between the two is timely. In their paper, they presented two case-based scenarios to illustrate how the ways students engaged with participants with neurodiverse

profiles[6] in a one-on-one movement program might have been influenced by their education, preconceptions, and priorities. Both students were exposed to critical dialogue, prior to the program, through at least one critical disability studies course and two critical pedagogy courses taught using an interdisciplinary approach. Despite this, one student did not critically reflect on her actions throughout the program to recognize how her engagement impacted the learning of the participant, resulting in a lack of conscious decisions made to adapt accordingly (Connolly & Harvey, 2018). Had she challenged her preconceptions and actions, she would have understood the meaning of certain supports (e.g., use of visual schedules) and instructional strategies (e.g., timing of activities and transitions) for the participant and what was in the participant's best interest. It is important that pre-service teachers learn to be reflexive in order to offer meaningful movement experiences for all children along the movement spectrum (Connolly & Harvey, 2018). Post-secondary educators should consider how to nurture reflexivity through course work.

[6] The phrase *neurodiverse profiles* reflects a broad range of neurological differences people experience that are a natural part of human variation.

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# APPENDICES

## Appendix A: Parent Information Letter (School)

**Study Title:** The experience of stress and coping in physical education for elementary school children with movement difficulties

**Principal Investigator:**
Chantelle Zimmer, PhD Candidate
Faculty of Kinesiology, Sport, & Recreation
University of Alberta
Edmonton, AB T6G 2H9
Email: czimmer@ualberta.ca
Phone: (xxx) xxx-xxxx

**Supervisor:**
Janice Causgrove Dunn, PhD
Faculty of Kinesiology, Sport, & Recreation
University of Alberta
Edmonton, AB T6G 2H9
Email: janice.causgrovedunn@ualberta.ca
Phone: (780) 492-0580

Dear Parent or Guardian:

My name is Chantelle Zimmer and I am a doctoral student at the University of Alberta. I am conducting a research study that is part of my degree program, with guidance from my supervisor Dr. Janice Causgrove Dunn.

**Background:** At this time I am asking children in Grades 4 to 6 who demonstrate difficulties with basic movement skills, which are needed to perform tasks in the classroom and in the gymnasium, to participate in three research activities to learn about their experiences at school, mainly in physical education. The difficulties children experience should *not* be the result of a medical or neurological condition affecting their movement such as cerebral palsy or muscular dystrophy, physical impairment where they may wear a prosthetic limb or use a mobility aid, visual or hearing impairment, or other impairments such as autism and Down syndrome. However, children who do not have any of the impairments outlined above, but experience learning or attention difficulties may be eligible to participate.

**Purpose:** The purpose of this study is to understand how children with movement difficulties experience and cope with stress in physical education. Specifically, I am interested in the problems children may experience and the positive and negative ways they deal with them.

**Study Procedures:** To determine if your child is eligible to participate, please take 10 to 15 minutes to complete the coordination questionnaire to the best of your ability. Depending on the score your child obtains on the questionnaire, they may be asked to complete a standardized motor test involving manual dexterity, aiming and catching, and balance activities for confirmation. This will take about 15 to 20 minutes and be done during school hours. Your child will be asked to participate in the remainder of the study only if they meet the inclusion criteria. You may be asked to provide information about specific difficulties your child experiences or diagnoses they have received to help confirm their inclusion in the study.

Should your child be eligible to participate they will be asked to make two pictures at home during quiet time to reflect on how they experience and cope with stress in physical education. For example, your child may be asked to make two pictures to show what a good and bad day in physical education is like for them. After your child has created the two pictures, I will schedule an interview with them to learn about their experiences. Your child should bring their pictures to the interview so we can talk about them. This interview will take between 20 and 30 minutes. A second interview will be arranged with your child later in the study to provide them the opportunity to give feedback on the initial findings. This feedback will help me to compare what each child said with what other children have said to find similarities and differences in experiences of stress and coping in physical education. The second interview will last about 15 to 20 minutes. Both interviews will be audio-recorded and typed out, your child's name will be removed, and the typed interviews will be given a code.

The two interviews will be completed with your child at their school during school hours, or if you prefer, at your home or another location such as the university during after school hours. Please select your preferred location for the two interviews on the attached consent form and include a phone number or email address you can be reached at. If you would like the interviews with your child to take place outside of school or if the interviews cannot be conducted at their school because of time constraints, I will contact you to make arrangements. Your child will only be asked to complete the motor test and three research activities if they return the signed consent and assent forms that are attached, and the completed coordination questionnaire, in the envelope provided to the principal at their school. If you would like you can also contact me directly by

phone or email to express your interest in the study. To make sure your child knows what their participation may involve, please explain the purpose and procedures of this study to them in a level appropriate to their understanding. If your child would like to participate in this study, I ask that you complete the attached consent form and coordination questionnaire and your child complete the assent form and return them to the school.

**Benefits:** Participation in this study will have no direct benefits for your child. I hope that by hearing from children I will be able to understand what they experience as stress in physical education and the ways they cope with it. This knowledge could help teachers become aware of and understand how children think and feel in physical education, and in turn, help them to manage difficult experiences.

**Risks:** There are no foreseen physical risks involved in this study. Information for this study will be gathered through pictures and two interviews so it is possible your child might experience some discomfort thinking about any negative experiences they may have had in physical education. However, the pictures may help manage potential discomforts because your child can take their time and choose which stories they want to share. Open-ended questions will be asked during the interviews so that your child will have the freedom to discuss what they feel comfortable sharing or what is important to them. I will also explain to your child that they can choose not to answer any questions they do not feel comfortable answering.

**Confidentiality:** Paper copies of any information gathered from your child will be stored in a locked office and electronic data files will be stored on a secure Internet server. Only the researchers involved in the study will be able to access the information. This information may be presented at conferences, in class lectures, and/or published in professional journals. Although a copy of your child's original pictures or direct quotations from the interviews may be presented, all identifying information such as their name will be removed. All information collected will be destroyed five years after the completion of the study.

**Voluntary Participation:** Your child has the choice to participate. Your child will be reminded that at any point during the study they can withdraw with no questions asked. If they stop taking part, they will not be asked any other questions. Information collected from children that leave the study will be destroyed right away if they wish for this to be the case. Withdrawal of the information is possible up to one month after the second interview is completed.

**Incentive:** Upon completion of the study, an educational resource such as a book will be given to each classroom involved to show appreciation for their time contributed to the study.

**Further Information:** If you have any further questions or concerns regarding this study please feel free to contact the principal investigator, Chantelle Zimmer, at czimmer@ualberta.ca, or her supervisor, Janice Causgrove Dunn, at janice.causgrovedunn@ualberta.ca. The plan for this study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615.

Thank you for your consideration,

Chantelle Zimmer, MSc
PhD Candidate

## Appendix B: Parent Consent Form (School)

**Study Title:** The experience of stress and coping in physical education for elementary school children with movement difficulties

**Principal Investigator:**
Chantelle Zimmer, PhD Candidate
Faculty of Kinesiology, Sport, & Recreation
University of Alberta
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Email: czimmer@ualberta.ca
Phone: (xxx) xxx-xxxx

**Supervisor:**
Janice Causgrove Dunn, PhD
Faculty of Kinesiology, Sport, & Recreation
University of Alberta
Edmonton, AB T6G 2H9
Email: janice.causgrovedunn@ualberta.ca
Phone: (780) 492-0580

| | | |
|---|---|---|
| Have you received and read a copy of the attached information letter? | Yes | No |
| Do you understand that your child has been asked to be in a research study? | Yes | No |
| Do you understand that your child will only be asked to complete the motor test and three research activities if they meet the inclusion criteria? | Yes | No |
| Do you understand you may be asked to provide information about specific difficulties your child experiences and diagnoses they have received to help determine their eligibility? | Yes | No |
| Do you understand the benefits and risks involved in your child's participation in this research study? | Yes | No |
| Do you understand the steps that will be taken to ensure confidentiality? | Yes | No |
| Do you understand who will have access to your child's information? | Yes | No |
| I understand my child's pictures may be used for public presentations and publications and give permission for this use. | Yes | No |

Do you understand that your child is free to refuse to participate or to withdraw from the study at any time up to one month after the second interview has been completed, without consequence, and that your child's information will be withdrawn at your request? Yes No

I agree to allow my child to take part in this research study. Yes No

I would like the two interviews with my child to take place at: Home/Other Location School

| | |
|---|---|
| **Signature of Parent/Guardian** | **Date** |
| **Printed Name** | **Phone Number or Email Address** |

## Appendix C: Child Assent Form (School)

**Study Title:** The experience of stress and coping in physical education for elementary school children with movement difficulties

**Principal Investigator:**
Chantelle Zimmer, PhD Candidate
Faculty of Kinesiology, Sport, & Recreation
University of Alberta
Edmonton, AB T6G 2H9
Email: czimmer@ualberta.ca
Phone: (xxx) xxx-xxxx

**Supervisor:**
Janice Causgrove Dunn, PhD
Faculty of Kinesiology, Sport, & Recreation
University of Alberta
Edmonton, AB T6G 2H9
Email: janice.causgrovedunn@ualberta.ca
Phone: (780) 492-0580

I want to tell you about a research study I am doing. A research study is a way to learn more about something. I would like to find out more about problems children may have in physical education and the positive and negative ways they deal with them.

If you agree to join this study, you may be asked to do a test where you trace a picture, throw and catch a ball, and walk on a line of tape to make sure you are a good match for the study. If you are a good match, you will be asked to make two pictures to show what a good day and bad day in physical education is like for you. You should create these pictures at home by yourself. You will also be asked to meet two times with me at your school, home, or another place like the university to talk about your experiences.

It is possible you might feel a little bit uncomfortable talking about what physical education is like for you. When you create your two pictures, you can choose what you feel comfortable making and talking about to me. During the meetings, you do not have to answer my questions if you do not want to. Just tell me you do not want to answer.

You do not have to join this study. It is up to you. Even if your parents give their permission for you to be in the study, you are allowed to say no. You can agree now and change your mind later. All you have to do is tell me you want to stop. No one will be mad at you if you do not want to be in the study or if you join the study and change your mind later and stop.

Before you say yes or no to being in this study, I will answer any questions you have. If you join the study, you can ask questions at any time. Just tell me that you have a question.

Yes, I will be in this research study. No, I do not want to do this.

_____ _____

**Printed Name of Child** **Date**

_____

**Signature of Child**

## Appendix D: Coordination Questionnaire

Year/Month/Day

Name of Child: _____ Today's Date: _____

Person Completing Questionnaire: _____ Child's Date of Birth: _____

Relationship to Child: _____ Child's Age: _____

Most of the motor skills that this questionnaire asks about are things that your child does with his or her hands, or when moving. A child's coordination may improve each year as they grow and develop. For this reason, it will be easier for you to answer the questions if you think about other children that you know who *are the same age as your child*.

Please compare the degree of coordination your child has with other children of the same age when answering the questions. Circle the *one* number that best describes your child. If you change your answer and want to circle another number, please *circle the correct response twice*.

If you are unclear about the meaning of a question, or about how you would answer a question to best describe your child, please contact Chantelle Zimmer, the principal investigator of this study, at czimmer@ualberta.ca or (xxx) xxx-xxxx for assistance.

| | **Not at all like your child** | **A bit like your child** | **Moderately like your child** | **Quite a bit like your child** | **Extremely like your child** |
|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** |
| 1. Your child *throws a ball* in a controlled and accurate fashion. | 1 | 2 | 3 | 4 | 5 |
| 2. Your child *catches* a small *ball* (e.g., tennis ball size) thrown from a distance of 6 to 8 feet (1.8 to 2.4 meters). | 1 | 2 | 3 | 4 | 5 |

| | Not at all like your child | A bit like your child | Moderately like your child | Quite a bit like your child | Extremely like your child |
|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** |

3. Your child *hits* an approaching *ball* or *birdie* with a bat or racquet accurately.

   1 2 3 4 5

4. Your child *jumps* easily *over* obstacles found in garden or play environment.

   1 2 3 4 5

5. Your child *runs* as fast and in a *similar* way to other children of the same gender and age.

   1 2 3 4 5

6. If your child has a *plan* to do a motor *activity*, he/she can organize his/her body to follow the plan and effectively complete the task (e.g., building a cardboard or cushion "fort," moving on playground equipment, building a house or a structure with blocks, or using craft materials).

   1 2 3 4 5

7. Your child's printing or *writing* or drawing in class is *fast* enough to keep up with the rest of the children in the class.

   1 2 3 4 5

8. Your child's printing or *writing* letters, numbers and words is *legible*, precise and accurate or, if your child is not yet printing, he or she *colors* and *draws* in a coordinated way and makes pictures that you can recognize.

   1 2 3 4 5

9. Your child uses appropriate *effort* or tension when printing or writing or drawing (no excessive pressure or tightness of grasp on the pencil, writing is not too heavy or dark, or too light).

   1 2 3 4 5

10. Your child *cuts* out pictures and *shapes* accurately and easily.

    1 2 3 4 5

11. Your child is interested in and *likes* participating in *sports or active* games requiring good motor skills.

    1 2 3 4 5

| | Not at all like your child | A bit like your child | Moderately like your child | Quite a bit like your child | Extremely like your child |
|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** |

12. Your child learns *new motor tasks* (e.g., swimming, rollerblading) easily and does not require more practice or time than other children to achieve the same level of skill.

    1 2 3 4 5

13. Your child is *quick and competent* in tidying up, putting on shoes, tying shoes, dressing, etc.

    1 2 3 4 5

14. Your child would ***never*** be described as a "*bull in a china shop*" (that is, appears so clumsy that he or she might break fragile things in a small room).

    1 2 3 4 5

15. Your child does ***not*** *fatigue easily* or appear to slouch and "fall out" of the chair if required to sit for long periods.

    1 2 3 4 5

## Appendix E: Parent Information Letter (Physical Activity Centre)

**Study Title:** The experience of stress and coping in physical education for elementary school children with movement difficulties

**Principal Investigator:**
Chantelle Zimmer, PhD Candidate
Faculty of Kinesiology, Sport, & Recreation
University of Alberta
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Phone: (xxx) xxx-xxxx

**Supervisor:**
Janice Causgrove Dunn, PhD
Faculty of Kinesiology, Sport, & Recreation
University of Alberta
Edmonton, AB T6G 2H9
Email: janice.causgrovedunn@ualberta.ca
Phone: (780) 492-0580

Dear Parent or Guardian:

My name is Chantelle Zimmer and I am a doctoral student at the University of Alberta. I am conducting a research study that is part of my degree program, with guidance from my supervisor Dr. Janice Causgrove Dunn.

**Background:** At this time I am asking children in Grades 4 to 6 who demonstrate difficulties with basic movement skills, which are needed to perform tasks in the classroom and in the gymnasium, to participate in three research activities to learn about their experiences at school, mainly in physical education. The difficulties children experience should not be the result of a medical or neurological condition affecting their movement such as cerebral palsy or muscular dystrophy, physical impairment where they may wear a prosthetic limb or use a mobility aid, visual or hearing impairment, or other impairments such as autism and Down syndrome. However, children who do not have any of the impairments outlined above, but experience learning or attention difficulties may be eligible to participate.

**Purpose:** The purpose of this study is to understand how children with movement difficulties experience and cope with stress in physical education. Specifically, I am interested in the

problems and challenges children may experience and the positive and negative ways they deal with them.

**Study Procedures:** To determine if your child is eligible to participate, please take 10 to 15 minutes to complete the coordination questionnaire to the best of your ability. Depending on the score your child obtains on the questionnaire, they may be asked to complete a standardized motor test involving manual dexterity, aiming and catching, and balance activities for confirmation. This will take about 15 to 20 minutes and occur before or after day camp hours. Your child will be asked to participate in the remainder of the study only if they meet the inclusion criteria. You may be asked to provide information about specific difficulties your child experiences or diagnoses they have received to help confirm their inclusion in the study.

Should your child be eligible to participate they will be asked to make two pictures at home during quiet time to show what a good and bad day in physical education is like for them. After your child has created the two pictures, I will schedule an interview with them to learn about their experiences. Your child should bring their pictures to the interview so we can talk about them. This interview will take between 20 and 30 minutes. A second interview will be arranged with your child later in the study to provide them the opportunity to give feedback on the initial findings. This feedback will help me to compare what each child said with what other children have said to find similarities and differences in experiences of stress and coping in physical education. The second interview will last about 15 to 20 minutes. Both interviews will be audio-recorded and typed out, your child's name will be removed, and the typed interviews will be given a code.

The two interviews will be completed with your child during before or after day camp or at your home. To make sure your child knows what their participation involves, please explain the purpose and procedures of this study to them in a level appropriate to their understanding. If you would like your child to participate and your child expresses interest in this study, please complete the attached consent form and have your child complete the assent form. Your preferred location for the two interviews should be indicated on the consent form. I ask that you email me the signed forms and completed coordination questionnaire so I can begin to determine your child's eligibility.

**Benefits:** Participation in this study will have no direct benefits for your child. I hope that by hearing from children I will be able to understand what they experience as stress in physical education and the ways they cope with it. This knowledge could help teachers become aware of and understand how children think and feel in physical education, and in turn, help them to manage difficult experiences.

**Risks:** There are no foreseen physical risks involved in this study. Information for this study will be gathered through pictures and two interviews so it is possible your child might experience some discomfort thinking about any negative experiences they may have had in physical education. However, the pictures may help manage potential discomforts because your child can take their time and choose which stories they want to share. Open-ended questions will be asked during the interviews so that your child will have the freedom to discuss what they feel comfortable sharing or what is important to them. I will also explain to your child that they can choose not to answer any questions they do not feel comfortable answering.

**Confidentiality:** Paper copies of any information gathered from your child will be stored in a locked office and electronic data files will be stored on a secure Internet server. Only the researchers involved in the study will be able to access the information. This information may be presented at conferences, in class lectures, and/or published in professional journals. Although a copy of your child's original pictures or direct quotations from the interviews may be presented, all identifying information such as their name will be removed. All information collected will be destroyed five years after the completion of the study.

**Voluntary Participation:** Your child has the choice to participate. Your child will be reminded that at any point during the study they can withdraw with no questions asked. If they stop taking part, they will not be asked any other questions. Information collected from children that leave the study will be destroyed right away if they wish for this to be the case. Withdrawal of the information is possible up to one month after the second interview is completed.

**Incentive:** At the end of the second interview, your child will be given a small gift as a token of appreciation for their time and energy participating in this study.

**Further Information:** If you have any further questions or concerns regarding this study please feel free to contact the principal investigator, Chantelle Zimmer, at czimmer@ualberta.ca, or her supervisor, Janice Causgrove Dunn, at janice.causgrovedunn@ualberta.ca. The plan for this study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615.

Thank you for your consideration,

Chantelle Zimmer, MSc
PhD Candidate

## Appendix F: Parent Consent Form (Physical Activity Centre)

**Study Title:** The experience of stress and coping in physical education for elementary school children with movement difficulties

**Principal Investigator:**
Chantelle Zimmer, PhD Candidate
Faculty of Kinesiology, Sport, & Recreation
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Phone: (xxx) xxx-xxxx

**Supervisor:**
Janice Causgrove Dunn, PhD
Faculty of Kinesiology, Sport, & Recreation
University of Alberta
Edmonton, AB T6G 2H9
Email: janice.causgrovedunn@ualberta.ca
Phone: (780) 492-0580

| | | |
|---|---|---|
| Have you received and read a copy of the attached information letter? | Yes | No |
| Do you understand that your child has been asked to be in a research study? | Yes | No |
| Do you understand that your child will only be asked to complete the motor test and three research activities if they meet the inclusion criteria? | Yes | No |
| Do you understand you may be asked to provide information about specific difficulties your child experiences and diagnoses they have received to help determine their eligibility? | Yes | No |
| Do you understand the benefits and risks involved in your child's participation in this research study? | Yes | No |
| Do you understand the steps that will be taken to ensure confidentiality? | Yes | No |
| Do you understand who will have access to your child's information? | Yes | No |
| I understand my child's pictures may be used for public presentations and publications and give permission for this use. | Yes | No |
| Do you understand that your child is free to refuse to participate or to withdraw from the study at any time up to one month after the second interview has been completed, without consequence, and that your child's information will be withdrawn at your request? | Yes | No |

I agree to allow my child to take part in this research study. Yes No

I would like the two interviews with my child to take place at: Day Camp Home

| | |
|---|---|
| _____ | _____ |
| **Signature of Parent/Guardian** | **Date** |
| _____ | _____ |
| **Printed Name** | **Phone Number or Email Address** |

## Appendix G: Child Assent Form (Physical Activity Centre)

**Study Title:** The experience of stress and coping in physical education for elementary school children with movement difficulties

**Principal Investigator:**
Chantelle Zimmer, PhD Candidate
Faculty of Kinesiology, Sport, & Recreation
University of Alberta
Edmonton, AB T6G 2H9
Email: czimmer@ualberta.ca
Phone: (xxx) xxx-xxxx

**Supervisor:**
Janice Causgrove Dunn, PhD
Faculty of Kinesiology, Sport, & Recreation
University of Alberta
Edmonton, AB T6G 2H9
Email: janice.causgrovedunn@ualberta.ca
Phone: (780) 492-0580

I want to tell you about a research study I am doing. A research study is a way to learn more about something. I would like to find out more about problems children may have in physical education and the positive and negative ways they deal with them.

If you agree to join this study, you may be asked to do a test where you trace a picture, throw and catch a ball, and walk on a line of tape to make sure you are a good match for the study. If you are a good match, you will be asked to make two pictures to show what a good day and bad day in physical education is like for you. You should create these pictures at home by yourself. You will also be asked to meet two times with me at day camp or home to talk about your experiences.

It is possible you might feel a little bit uncomfortable talking about what physical education is like for you. When you create your two pictures, you can choose what you feel comfortable making and talking about to me. During the meetings, you do not have to answer my questions if you do not want to. Just tell me you do not want to answer.

You do not have to join this study. It is up to you. Even if your parents give their permission for you to be in the study, you are allowed to say no. You can agree now and change your mind later. All you have to do is tell me you want to stop. No one will be mad at you if you do not want to be in the study or if you join the study and change your mind later and stop.

Before you say yes or no to being in this study, I will answer any questions you have. If you join the study, you can ask questions at any time. Just tell me that you have a question.

Yes, I will be in this research study. No, I do not want to do this.

_____ _____

**Printed Name of Child** **Date**

_____

**Signature of Child**

## Appendix H: Pre-Interview Activities

[Date]

Dear [child's name],

Thank you for agreeing to take part in an interview with me. I am interested in getting to know you a little better and learning about what physical education classes are like for you.

Before the interview, I would like you to make two pictures if you can. You should create these pictures by yourself at home during quiet time. The pictures can be a drawing, collage, or something made on the computer. You may use pen, pencil, coloured markers, pencil crayons, crayons, stickers, or other arts and crafts material, and any type of paper you have at home.

1. Make a picture to show what a <u>good day</u> in physical education is like for you. Feel free to use thought bubbles or speech bubbles.
2. Make a picture to show what a <u>bad day</u> in physical education is like for you. Feel free to use thought bubbles or speech bubbles.

Please remember to bring the two pictures to the interview at [location] on [date]. Making the pictures may help you to remember more details about your experiences and talk to me about them during the interview. If I can look at the pictures while you tell me about them, it will also help me to know what you mean.

If you have any questions about the pictures, just let me know.

Chantelle Zimmer
Email: czimmer@ualberta.ca
Phone: (xxx) xxx-xxxx

## Appendix I: Child Interview Guide #1

To start, I will ask you some questions that will help me to learn more about you and then we will talk about the pictures you made. As a reminder, there are no right or wrong answers to the questions; this is not a test. I am interested in what you have to say. You do not have to answer a question if you do not want to, just tell me. Do you understand?

I will be recording this interview so that I can listen to it again later. No one will be able to listen to the recording after the interview except for me. This means your principal and teacher will not hear what you tell me and I will not tell them what you said either. If I use what you tell me in a presentation or a paper for my school, no one will know that it came from you. You can turn the audio recorder off at any time or we can stop the interview if you feel uncomfortable. Does everything sound good?

**Part 1: General Questions**

1. Can you tell me about your school? Class? Teacher? Friends?
    - What are your favourite or least favourite places in school?
    - What is your favourite or least favourite subject?
    - What is your teacher like?
    - What are your friends like?
2. What are some parts of school that make it good? Is there a school day you can remember that stands out as being really good?
    - What happened?
    - How did you feel?
3. What are some parts of school that make it hard or a challenge? Can you remember a school day that was really hard?
    - What happened?
    - How did you feel?
    - What did you do to make yourself feel better?

**Part 2: Grand Tour Questions - Transition to the Two Pictures**

4. Can you describe what a good day in physical education is like for you?
    - What happens during a good day in physical education for you?
    - What makes these parts of physical education good?
    - How do you feel?
    - What are some of the things you think about?
    - What do you do?
    - Have you experienced this more than once in physical education?
5. Can you tell me what a bad day in physical education is like for you?
    - What happens during a bad day in physical education for you?
    - What makes these parts of physical education bad?
    - How do you feel? Which feeling is the strongest?
    - What thoughts come into your head?
    - What do you do to feel better? Does it work? What are some reasons you think it works or does not work?
    - Have you experienced this more than once in physical education?
        - How did you feel when it happened again?
        - What did you do that was the same or different from what you did before?
        - Why did you choose to do or not do something different?
        - Did it change the situation or make it stay the same?
6. Can you tell me about another good day you had in physical education that is different from the picture you made? What about a bad day?

**Part 3: Wrap-up Questions**

7. If you could change physical education classes any way you wanted to make them better for you, what would you change?
    - How would that make physical education better for you?
8. What else do you think is important for me to know?

## Appendix J: Child Interview Guide #2

To start, I will ask you some questions that will help me learn more about the experiences in physical education you told me about during the last interview. Then, I will ask you some questions based on what I heard from other children in the study. As a reminder, there are no right or wrong answers to the questions; this is not a test. I am interested in what you have to say. You do not have to answer a question if you do not want to, just tell me. Do you understand?

I will be recording this interview so that I can listen to it again later. No one will be able to listen to the recording after the interview except for me. This means your principal and teacher will not hear what you tell me and I will not tell them what you said either. If I use what you tell me in a presentation or a paper for my school, no one will know that it came from you. You can turn the audio recorder off at any time or we can stop the interview if you feel uncomfortable. Does everything sound good?

**Part 1: Participant Specific Questions**

1. During the first interview, you told me that you sometimes dislike having to follow a unit in physical education. Can you tell me about a time in physical education when you had to follow a unit?
    - What was the unit?
    - How did it make you feel?
    - What did you think about?
    - What did you do to make yourself feel better? Did it work?
    - How is this experience different from when your teacher gives you free time?
2. You also told me that you do not have as much energy as the other kids in the class. Can you tell me more about this?
    - What activities are difficult for you in physical education because of this?
    - How does having low energy make you feel?
    - What are some things you think about?
    - What do you do when you have low energy?

3. After having a bad day in physical education, have you ever thought about it later?
    - What did you think about?
    - How did this make you feel?
    - Did you talk to anyone about it?
    - What did you do to make yourself feel better? Did it work?

**Part 2: Shared Experience Questions**

4. Some children talked about how their friends make physical education a more positive experience for them. Do your friends make physical education better? Can you tell me about a time your friends made physical education better for you?
    - What happened?
    - What did you do with your friends?
    - How did it make you feel?
5. Some children talked about how other children in their class make fun of them or do not include them in a game. Have you experienced this before in physical education? Can you tell me about a time other children in your class were not so nice to you?
    - What happened?
    - How did you feel?
    - What did you think?
    - What did you do to make yourself feel better? Did it work?
6. Some children talked about asking the teacher for help when they could not do something in physical education. Have you done this before? Can you tell me about a time you asked your teacher for help in physical education?
    - What happened?
    - What did the teacher do?
    - How did you feel?
    - What are some reasons you think asking your teacher for help makes you feel better?

7. Some children talked about activities that are difficult for them in physical education and how they do the activity even though they think it is hard. Have you done this? Can you describe a time when you kept trying to do an activity in physical education you thought was hard?
    - What was the activity?
    - What happened?
    - How did you feel?
    - What did you do to make yourself feel better? Did it work?

**Part 3: Wrap-up Questions**

8. If you could tell teachers or other children how to make physical education classes better for everyone, what would you say?
9. Is there anything else you think is important for me to know?

## Appendix K: Teacher Information Letter

**Study Title:** Understanding elementary teachers' perspectives of children with movement difficulties in physical education and how this informs their pedagogical practices

**Principal Investigator:**
Chantelle Zimmer, PhD Candidate
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Phone: (xxx) xxx-xxxx

**Supervisor:**
Janice Causgrove Dunn, PhD
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Dear Teacher:

My name is Chantelle Zimmer and I am a doctoral student at the University of Alberta. I am conducting a research study that is part of my degree program, with guidance from my supervisor Dr. Janice Causgrove Dunn.

**Background:** At this time I am asking K-6 elementary teachers who have at least one year of experience instructing children in physical education to participate in a study. A face-to-face interview will be conducted with interested teachers to learn about their perceptions of children who demonstrate movement difficulties and how this influences their pedagogical practices in physical education.

**Purpose:** The purpose of this study is to understand how your awareness and understanding of children who demonstrate movement difficulties in physical education informs your roles and responsibilities. Specifically, I am interested in how you perceive children with movement difficulties in physical education, concerns you have for these children, and how you address these concerns.

**Study Procedures:** The interview will take between 45 and 60 minutes and occur at your school (not during school hours though), home, or other location of your choice, depending on your preference and availability. The audio-recorded interview will be typed, your name will be removed, and the typed interview will be given a code. You will be emailed the interview transcript to check for accuracy of the data and provide feedback that will help inform my interpretation of the data. I will compare what each elementary teacher said with what other teachers have said to find similarities and differences in experiences instructing and supporting children with movement difficulties in physical education. A summary of the research findings will be emailed to participants near the completion of the study to ensure my interpretation of the data represents what was said and is comprehensible. Only the teachers who contact me by phone or email, and sign the attached consent form, will be asked to complete the interview. Again, I ask that you contact me if you would like to participate in this study. I will obtain the signed consent form from you at the time of the interview.

**Benefits:** There are no direct benefits for elementary teachers who participate in this study. I hope that by hearing about your perspective of children who demonstrate movement difficulties in physical education, I will learn about your understanding of these children and how you address their perceived needs. This knowledge may lead to the development of resources to help other teachers become aware of who these children are and ways to address their needs in physical education.

**Risks:** There are no foreseen physical or psychological risks involved with your participation.

**Confidentiality:** Hard copy data will be stored in a locked office and electronic data files will be stored on a secure Internet server and only researchers involved in the study will be able to access the information. This information may be presented at conferences, in class lectures, and/or published in professional journals. Although direct quotations from the interview may be presented, all identifying information (e.g., name) will be removed from the data. All data will be destroyed five years after the completion of the study.

**Voluntary Participation:** You are under no obligation to participate in this study and can withdraw at any point with no questions asked. Data from teachers who choose to leave the study will be destroyed right away if they wish for this to be the case. Withdrawal is possible up to one month after the interview is completed.

**Further Information:** If you have any further questions or concerns regarding this study please feel free to contact the principal investigator, Chantelle Zimmer, at czimmer@ualberta.ca, or her supervisor, Janice Causgrove Dunn, at janice.causgrovedunn@ualberta.ca. The plan for this study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615.

Thank you for your consideration,

Chantelle Zimmer, MSc
PhD Candidate

## Appendix L: Teacher Consent Form

**Study Title:** Understanding elementary teachers' perspectives of children with movement difficulties in physical education and how this informs their pedagogical practices

**Principal Investigator:**
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**Supervisor:**
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| | | |
|---|---|---|
| Do you understand that you have been asked to be in a research study? | Yes | No |
| Have you received and read a copy of the attached information letter? | Yes | No |
| Do you understand the benefits and risks involved in participating in this research study? | Yes | No |
| Do you understand the steps that will be taken to ensure confidentiality? | Yes | No |
| Do you understand who will have access to your information? | Yes | No |
| Do you understand that you are free to refuse to participate or to withdraw from the study at any time up to one month after the interview has been completed, without consequence, and that your information will be withdrawn at your request? | Yes | No |
| I agree to take part in the face-to-face interview. | Yes | No |
| I would like the interview to take place at: | School | Home | Other |

_____ _____
**Signature** **Date**

_____ _____
**Printed Name** **Email Address**

_____
**Phone Number (Optional)**

## Appendix M: Teacher Interview Guide

There are no right or wrong answers; this is intended to be a conversation. I have come up with some questions, but if there are questions I do not ask you and you are able to share additional information, please do so. Any information about your experiences working with children with movement difficulties in physical education will be useful.

**Demographic Questions**

- Can you tell me about your academic education?
- Did you complete any physical education courses during your undergraduate program? How many?
- Do you have any other certifications or professional training?
- How many years have you been teaching at the elementary level?
- What grade level do you currently teach?
- How many children are in your class? Is that typical?
- Have you taught any other grade levels? Which ones?
- How many times a week do you teach physical education and for how long?

**Questions about Participants' Experiences Teaching Physical Education**

1. Can you describe what a typical physical education class is like for you?
2. What are some of the things you like about teaching physical education?
3. Can you tell me about a physical education class you taught that you thought was a successful learning experience?

**Questions about Participants' Understanding of Movement Difficulties**

4. What kinds of things come to mind when you hear the term movement difficulties?
5. Can you describe the characteristics of the children in your class who demonstrate movement difficulties?
    - What specific skills do these children struggle with? Physical, cognitive, emotional, or social skills?
    - What might be the reason(s) for these difficulties?

6. How do these children's movement difficulties impact their experiences in physical education?
    - How does it impact their engagement and learning?
    - How do these children feel?
    - How do these children interact with others in the class?
7. What are some of the concerns you have for children with movement difficulties in physical education? Physical, cognitive, emotional, or social concerns?

**Questions about Participants' Role in Addressing the Perceived Needs of Children with Movement Difficulties in Physical Education**

8. What do you think your role is in physical education for a child who has movement difficulties?
    - Who do you think is responsible for supporting or assisting these children in physical education? Why?
    - How do you think children with movement difficulties benefit from this support or assistance in physical education?
9. What have you done to address the concerns you have for these children?
    - What do you think worked or did not work?
    - What are some of the reasons you think it worked or did not work?
    - Is there anything you wish you had done differently?
10. What are some of the challenges you face in addressing concerns you have for children with movement difficulties in physical education?
11. What kinds of things would enable you to better address the needs of children with movement difficulties in physical education?
12. What advice would you give to a newly hired teacher who has to instruct physical education, and has a student in his or her class with movement difficulties?