SOCIAL-EMOTIONAL LEARNING CLASSES AND RISKY PLAY IN KINDERGARTEN:

A PERSON-CENTRED APPROACH

by

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A THESIS SUBMITTED IN PARTIAL FUFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

in

THE FACULTY OF GRADUATE AND POSTDOCTORAL STUDIES

(Early Childhood Education)

THE UNIVERSITY OF BRITISH COLUMBIA

(Vancouver)

April 2026

The following individuals certify that they have read, and recommend to the Faculty of Graduate and Postdoctoral Studies for acceptance, the thesis entitled:

Social-Emotional Learning Classes and Risky Play in Kindergarten: A Person-Centred Approach

submitted by Karen Dsouza in partial fulfilment of the requirements for the degree

Of Masters of Arts

in Early Childhood Education

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Abstract

Social-emotional functioning in early childhood is a strong predictor of later academic achievement, mental health, and social adjustment. Research on outdoor risky or adventurous play highlights potential benefits for social skills, emotion regulation, and prosocial behaviour. Utilizing both areas of research, Social emotional learning (SEL) profiles at kindergarten were examined in a sample of 14,609 children in British Columbia, Canada using teacher reported SEL through the Early Development Instrument (EDI) and parent-report measure of children's disposition toward, and opportunity for, risky play through the Childhood Experiences Questionnaire (CHEQ).

Mean-level comparisons relative to Class 1 (Overall high SEL profile) indicated Class 2 (Compliant–Reserved) and Class 3 (Moderately Compliant–Anxious) profiles showed lower disposition and opportunity than Class 1, whereas Class 4 (Moderately Compliant–Restless) Class 4 and Class 5 (Non-compliant and Disruptive) profiles showed higher levels on both, suggesting broad alignment between children's inclination and affordances. In contrast, the Class 6 (Overall Low SEL) combined elevated disposition with reduced opportunity, suggesting a mismatch between interest and access.

Mediation models suggested that opportunity partly explained lower risky-play dispositions in some compliant profiles, fully explained them in others, and showed an inconsistent mediation pattern for Class 6 (Overall Low SEL group), where opportunity also appeared to constrain dispositions. Moderation analyses showed that the opportunity–disposition link was stronger for females, especially those in anxious profiles. Implications of how parents and educators understand risky play across SEL groups are discussed.

Lay Summary

Children's social and emotional skills in the early years are closely linked to later success in school and beyond. Risky or adventurous play (for example climbing high or moving fast) may support these skills by helping children practise managing fear, emotions, and social situations. This thesis drew on teacher and parent reports for 14,609 kindergarten children in British Columbia to examine how different social-emotional learning (SEL) profiles relate to children's interest in, and opportunities for, risky play. Six SEL profiles were identified. Compared with the high-skill group, some profiles (Compliant–Reserved, Moderately Compliant–Anxious) showed less interest in risky play and fewer opportunities, while others (Moderately Compliant–Restless, Non-compliant and Disruptive) showed more of both. Children with broadly low SEL stood out: they were keen on risky play but had fewer opportunities. For some groups, limited opportunity partly explained lower interest, whereas for the lowest-SEL group it seemed to restrict an existing strong interest, with patterns generally weaker for females.

Preface

This thesis is the original, independent, intellectual and unpublished work by the author, Karen Dsouza. Dr. Laurie Ford supervised this project. The study was reviewed and approved by the University of British Columbia Ethics Board (BREB), with the certification approval number H24-03958**.** Occasionally, An AI language model (Perplexity, powered by GPT-5.1) was used to support writing tasks. Specifically, AI assistance was used to a) Suggest alternate phrasing for words when needed b) Check clarity of explanations for technical sections. All research questions, study design, data analysis, and final interpretations were my own, and any AI-suggested text was critically reviewed and revised before inclusion in the thesis.

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Acknowledgements

I would like to thank the many people who have been instrumental in my research journey. First, I am deeply grateful to my supervisor, Dr. Laurie Ford, for her guidance, enthusiasm, and unwavering encouragement to pursue this work. I also wish to thank my committee member, Dr. Barry Forer, whose generosity, wisdom, and positivity made it possible for me to complete this thesis. I am grateful to Dr. Amery Wu, my external examiner and one of the finest instructors I have had. I also thank my research lab members and peers for their support, their willingness to listen, and the many conversations that helped shape my ideas. Finally, I would like to thank my family. To my husband, Rohan, thank you for your constant love, patience and belief in me. To my daughter, Zarah, thank you for being my cheerleader and my joy. To my mother, Irin, I am because of you.

Chapter One: Introduction

Chapter One Overview

In this chapter, I present a concise overview of my thesis topic. I begin with a broad introduction, then outline the rationale and purpose of my study. I define key terms and conclude the chapter by stating my positionality as a researcher.

Overview

The Canadian Position Statement on Active Outdoor Play emphasizes the critical importance of providing children with opportunities for active play in nature and outdoor environments, despite the inherent risks involved. It highlights that access to active play in nature and outdoors, with its associated risks is essential for healthy child development (Tremblay et al., 2015). Over the past few years, children's opportunity to play, especially outdoors has significantly reduced (Gray, 2013).

While extensive research has demonstrated the significant benefits of outdoor play for children's physical development (Brussoni et al., 2015; Engelen et al., 2013; Pellegrini & Smith, 1998), there remains gaps in empirical evidence regarding the impact of risky play on children's social emotional learning (SEL). SEL is widely recognized as crucial focus areas in early childhood development and serve as key indicators of school readiness (Blair & Raver, 2015; Durlak et al., 2011). Existing evidence suggests that risky outdoor play can support children's social and emotional development but less is known about how these associations vary across different configurations of SEL strengths and difficulties or how they depend on the opportunities children have for risky play.

Purpose of the Study

The purpose of this retrospective cohort study is to examine how distinct social-emotional learning (SEL) latent classes in Kindergarten-aged children (5–6 years) are associated with their predisposition to engage in outdoor risky play, and how this relationship may differ by gender and by the opportunities children have for risky play in the Canadian context.

Key Terms

Risky Play

Risky play is defined as thrilling and exciting forms of play that involve a risk of physical injury (Sandseter, 2009). Risky play can be classified into six distinct categories: 1) play with great heights 2) play with high speed 3) play with dangerous tools that can lead to injuries, 4) play near dangerous elements like fire 5) rough-and-tumble play (Sandseter, 2009).

Outdoor

In this study, "outdoor" refers to any open-air environment beyond the confines of houses or school buildings, where children have opportunities for unstructured and potentially risky play. This encompasses a wide range of settings, including: 1) natural environments including forests, parks, beaches, and other green spaces, 2) Built outdoor spaces including playgrounds, sports fields, and urban areas, 3) semi-wild areas including vacant lots, undeveloped land, and areas on the periphery of human settlements

Social Emotional Learning (SEL)

Social Emotional Learning (SEL) is the process through which all young people and adults acquire and apply the knowledge, skills, and attitudes to develop healthy identities, manage emotions and achieve personal and collective goals, feel and show empathy for others,

establish and maintain supportive relationships, and make responsible and caring decisions (Collaborative for Academic, Social and Emotional Learning [CASEL], 2007).

Positionality

As a researcher examining the relationship between children's engagement in outdoor risky play and their social competencies in Vancouver, Canada, it is crucial to acknowledge my positionality and how it may influence my work. My life experiences, identity and worldview significantly impact my work, my encounters, and the processes I chose and the interpretations I will choose to make (Foote and Bartell, 2011). Reflecting on my own preconceptions will allow me to situate my role in the broader context of how I think and what I do.

I identify as a woman of color, originally from India, with extensive experience working with children and young people in low-income backgrounds across India, Malaysia, Kenya, and the United States. This diverse international experience has provided me with a unique perspective on how socioeconomic factors significantly impact child outcomes. Growing up in Mumbai, I witnessed stark poverty, which initially desensitized me. However, my experiences working in low-income communities as a teacher transformed my understanding of poverty's realities and sparked my passion for education.

My professional background spans over 15 years, encompassing work in various contexts including low-income schools, high-income private institutions, childcare institutes, nonprofits, and youth homes. This breadth of experience has reinforced my understanding of how crucial socioeconomic factors are in shaping adult outcomes. I approach education and my research through a social justice lens, recognizing that while education can be transformational, it is just one of many factors influencing outcomes.

Working with vulnerable populations, including children of sex workers, trafficked children, and abandoned children, has deepened my awareness of the multi-generational impacts of trauma and Adverse Childhood Experiences (ACEs). This background will be invaluable when analyzing data on children's social competencies in Vancouver, as I recognize that these skills may be influenced by factors beyond just engagement in risky play.

As someone who has worked in both urban and rural settings, I am attuned to the importance of environmental characteristics in child development. This awareness aligns well with my research aim to identify potential moderating factors, including environmental characteristics, that may influence the relationship between risky play and social competencies. My commitment to inclusion and recognizing the diverse backgrounds of children will be particularly relevant in the Canadian context, where multiculturalism is a key aspect of society. This perspective will help me consider how cultural factors might influence both engagement in outdoor risky play and the development of social competencies.

While my previous work has been primarily in developing countries, I acknowledge that the Vancouver context may present unique challenges and opportunities. I am committed to approaching this research with an open mind, ready to learn from the secondary data and adapt my understanding accordingly. My experiences have led me to adopt a positivist approach, aiming to produce findings that can be applicable across a wide variety of settings. However, as a researcher working with secondary data, I must be aware of the limitations and potential biases inherent in the datasets I'm using. I will approach the data critically, considering the methods used to collect it and any potential gaps or biases in the information available.

By acknowledging these aspects of my positionality, I aim to conduct this research with awareness of my own perspectives and biases, ensuring a more nuanced and comprehensive

understanding of the relationship between outdoor risky play and children's social competencies in Vancouver, while also recognizing the potential broader applicability of the findings.

Chapter One Summary

In this chapter the thesis is introduced with its focus on the relationship between children's engagement in outdoor risky play and their social competencies. It begins by highlighting the Canadian Position Statement on Active Outdoor Play, which focuses on the critical importance of outdoor play for healthy child development despite inherent risks. It then outlines the gap this study addresses, namely how children's SEL profiles shape their disposition toward risky play. Key terms such as "risky play," "outdoor," and "social emotional learning" are defined to provide clarity. The chapter also includes a positionality statement, where I reflect on my experience working with children in various socioeconomic contexts. This background informs a social justice approach, emphasizing the importance of considering cultural and environmental factors in child development.

Chapter 2: Literature Review

Play and Child Development

Defining Play

The concept of play, while universally recognized, defies simple definition due to its multifaceted nature. Alden and Pyle note that Play is often overused but maybe not fully understood all (Alden and Pyle, 2019). Sutton Smith (1997) in his book 'The ambiguity of Play.' emphasized that play's essence lies in its flexibility rather than precise categorization, highlighting the dynamic nature of playful activities. Gray's (2013) play framework identifies five essential elements that characterize authentic play: 1) self-chosen and self-directed; (2) intrinsically motivated; (3) structured by mental rules; (4) imaginative; and (5) produced in an active, alert, but non stressed frame of mind. Eberle (2022) offers a definition of play that considers its dynamic nature. He proposes six basic elements of play: anticipation, surprise, pleasure, understanding, strength and poise. Eberle explores the emotional, physical, and intellectual dimensions of these elements. He argues that play needs to be recognized as evolution-based and developmentally beneficial. However, Eberle insists that at its most fundamental level, play always promises fun. He contends that any activity lacking these six elements does not fully qualify as play.

Benefits of Play

The universal recognition of play's benefits, particularly in early childhood development, stands in contrast to the challenges in defining it. Play has been known to impact overall child development social and emotional development, physical development, cognitive development (Hughes, 2010; Karpov, 2005; Whitebread et al., 2011).

The importance of play is widely acknowledged on an international scale and is enshrined in the United Nations Convention on the Rights of the Child. Within Canada, this

recognition is reflected in the Early Years Framework, emphasizing play's essential role in children's development and well-being. The framework's seventh principle explicitly states that play is integral to both well-being and learning, highlighting its fundamental contribution to developmental processes. Moreover, the framework expands the concept of play by incorporating terms such as engagement, experimentation, inquiry, building theories, participating, making meaning and investigating. These terms illustrate the multifaceted nature of play and its capacity to foster various aspects of learning and development. While the definition of play may be fluid and adaptable, its significance in supporting child development remains unequivocal.

Understanding Risky Outdoor Play

Conceptualizing Risk and Risky Play

Outdoor play is a crucial component of childhood development, characterized by activities that are freely chosen and driven by children themselves in open-air, natural settings. This form of play encompasses a broad spectrum of experiences, from quiet observation to vigorous physical activity, enabling children to explore, discover, and learn about their environment. Within this broader context, risky play stands out as a significant subcategory. As noted by Stephenson (2003), it is difficult to define play without incorporating elements of risk-taking behavior. Risky play involves thrilling and exciting activities that carry the potential for physical injury (Sandseter, 2007a, 2007b). When children are given the time, space, and freedom for unstructured play, risky play often naturally emerges (Brussoni, 2020).

The term risky carries various connotations, encompassing both positive and negative outcomes (Madge and Barker, 2007). Stephenson, drawing on the work of other scholars, explores the etymological roots of the term risk to reveal its complex historical perception. The

term's evolution demonstrates that risk has been viewed through a multifaceted lens, encompassing positive, negative, and ambivalent connotations. This dichotomy in perception is fundamental to understanding the complexity of risk as a concept. Risk is subjective; what one person perceives as a risk may not be viewed the same way by another. This social construction of risk influences individual perceptions and responses. Furthermore, risk is frequently confused with hazard (Sandseter, 2007a). Ball et al. (2008) clarify this distinction by explaining that hazards are environmental dangers beyond a child's capacity to assess and manage safely, whereas risks are challenges within the play environment that children can recognize and potentially learn to navigate.

Cooke et al. (2021) provide a nuanced understanding of risky play by distinguishing between two key concepts: being at risk and risk-taking. This distinction offers valuable insight into the nature of children's engagement with risky play. "Being at risk" refers to a state of vulnerability where an individual faces potential harm, often involuntarily. This situation typically implies a passive position, where the person has little control over their exposure to potential negative outcomes. In contrast, risk-taking involves an active, voluntary decision to engage in activities with uncertain outcomes. These activities may result in either positive or negative consequences, but the crucial element is the child's choice and willingness to face potential challenges or rewards. In the context of risky play, the focus is primarily on the latter concept of risk-taking. Children actively seek out thrilling and exciting forms of play that involve uncertainty and a potential risk of physical injury. This aligns with Sandseter's (2009) definition of risky play as "thrilling and exciting forms of physical play that involve uncertainty and a risk of physical injury (p.4).”

Categories of Risky Play

Sandseter's (2007a, 2007b) groundbreaking research on risky play in children has significantly shaped our understanding of this crucial aspect of child development. Through extensive observation and analysis, Sandseter identified six distinct categories of risky play:

1. Play at great heights: This includes activities like climbing trees or structures, balancing on elevated surfaces, or jumping from high places.
2. Play with high speed: Encompassing activities such as cycling at high speeds, sliding, or swinging on playground equipment.
3. Play with dangerous tools: Involving the use of potentially harmful objects like knives, axes, or ropes, under appropriate supervision.
4. Play near dangerous elements: This category includes activities near fire, deep water, or cliff edges.
5. Rough-and-tumble play: Involving physical contact, wrestling, or play-fighting with peers.
6. Play where children can disappear or get lost: Exploring unfamiliar areas or hiding in spaces away from adult supervision.

These categories have been widely adopted in the literature on risky play, providing a framework for understanding and studying children's risk-taking behaviors in play contexts. Recent research has expanded on Sandseter's work, recognizing that risky play extends beyond physical risks to encompass emotional, cognitive, and social dimensions (Sandseter et al., 2021). This broader perspective acknowledges that children engage in risk-taking behaviors that challenge their emotional resilience, cognitive abilities, and social skills.

In conclusion, it can be summarized that risks present opportunities for children to make decisions, assess their capabilities, and learn from their experiences. This distinction is crucial for creating play environments that are both safe and developmentally beneficial, allowing children to encounter manageable risks while being protected from genuine hazards.

Reasons for Children Taking Risks

Risk-taking in play is a natural part of children's play (Smith, 1997). Risky play has been viewed as crucial component of the evolutionary process (Sandseter, 2011). In one of the classic works on animal and human play Aldis (1975) points out that much of children's play is related to fear, and that young children actively seek out the thrills of fearful situations such as swinging and jumping from high places.

When mammals engage in play which is risky, animals learn how to deal with unexpected situations, both physically and emotionally (Spinka et al., 2001). When animals play, they're practicing how to handle surprises and loss of control. This is termed as 'training for the unexpected'. Risky play serves as a fundamental developmental mechanism that helps children navigate their innate fears (Sandseter & Kennair, 2011). Children are born with inherent protective fears, such as the fear of heights and strangers, which serve as natural safety mechanisms. Through risky play, children systematically confront and gradually overcome these fears in a controlled environment. This process involves encountering manageable challenges and setbacks that activate their stress response system in measured ways, enabling them to develop robust strategies for managing physiological and emotional responses to stressful situations. We cannot learn crucial skills needed in our daily life such as climbing stairs, swimming, riding a bicycle, boiling an egg, and driving a car if we do not take risks in our life (Eager & Little, 2011).

Emotional regulation theory provides compelling evidence for the developmental significance of risky play in young mammals' emotional maturation. Through engagement in dangerous play activities, young mammals develop sophisticated mechanisms for managing fear and anger - two fundamental emotions that require careful regulation for successful social interaction. This process unfolds naturally as they encounter manageable fears and learn to adapt to various challenges in their play environment. When minor injuries or setbacks occur during play, young mammals learn valuable lessons in emotional control. Rather than allowing anger or frustration to overwhelm them, they develop the capacity to modulate these emotions to maintain social connections and continue playing with peers. This ability to regulate emotional responses in challenging situations is crucial for their development. The process serves multiple developmental purposes: it helps young mammals calibrate their emotional responses to various situations, develop resilience in the face of challenges, and build the social-emotional skills necessary for complex social interactions. As they repeatedly encounter and overcome manageable risks during play, they gradually build a robust emotional regulatory system that helps them navigate real-world challenges without being overwhelmed by negative emotions. This natural training ground proves invaluable in developing the emotional competencies necessary for successful adaptation to their environment (LaFreniere, 2011).

The cognitive and behavioral perspective on risky play suggests that adventurous activities provide children with valuable opportunities to develop resilience against anxiety. A conceptual model proposed by Dodd and Lester (2019) propose adventurous play as a mechanism for reducing risk for childhood anxiety. By engaging in thrilling, slightly scary play experiences, children learn to manage fear, cope with uncertainty, and understand their body's responses to excitement. This approach indicates that such play helps children build positive

expectations about handling challenges, reduces their tendency to catastrophize, and increases their tolerance for uncertainty. This perspective argues that allowing and encouraging adventurous play may serve as a protective factor against the development of anxiety disorders in children by enhancing their cognitive and behavioral coping mechanisms.

Sandseter's 2010 study involving 23 preschoolers aged 4-5 revealed that the 'walk on the dangerous edge' was a central aspect of risky play. The research employed Reversal Theory to analyze children's behaviors in two distinct states: the paratelic (excitement-seeking) and telic (anxiety-avoiding) modes. When the paratelic state prevailed, children embraced potential fear through arousal-increasing strategies, maintaining their engagement in play. Conversely, when the telic state dominated, children exhibited arousal-avoidance strategies and ultimately withdrew from play activities. The study uncovered that the phenomenological structure of children's risky play was characterized by rapid alternations between paratelic and telic states, resulting in a mix of pleasant and unpleasant emotions. This ambiguous nature of quick reversals between states appeared to be a key motivator for children to engage in risky play, with the 'walk on the dangerous edge' emerging as a primary goal.

Influences in Risk Taking Behavior

The propensity for engaging in risky play and the readiness to embrace physical risks varies significantly among individuals. Sandseter (2009) proposes that risks can arise because of subjective and objective risks. Risks that arise from the individual characteristics of the child, which are considered subjective risk. This involves how individual children perceive and respond to risk in different situations. Subjective risk is influenced by factors such as the child's personal characteristics, past experiences with risky play, individual risk assessment abilities and sensation-seeking personality traits. Multiple studies have emphasized that subjective risk

assessment is deeply personal, shaped by individual perceptions and evaluations of potentially risky situations (Caspi & Silva, 1995; Cook et al., 1999). This individualized disposition of risk perception means that what one child considers thrilling and manageable might be perceived as overwhelming or dangerous by another, highlighting the importance of understanding individual differences in risk assessment and tolerance when considering children's engagement in risky play.

Research has demonstrated that environmental factors and available equipment significantly influence the levels of risk children encounter during play. These objective risks, as defined in the literature, represent concrete, measurable elements inherent in the physical environment or activity itself. Sandseter's (2009) research identifies several key categories of objective risks in children's play environments: play near dangerous elements (steep cliffs, bodies of water, campfires), activities at significant heights, play involving high speeds. However, the concept of risk itself is not an absolute reality but rather a socially constructed phenomenon that varies across individuals and contexts (Beck, 2006; Doron, 2016). An environment or activity that one child or community perceives as hazardous might be viewed as perfectly acceptable by another, depending on their previous experiences, cultural background, and personal comfort levels. The interpretation of environmental risks is deeply influenced by individual experiences and cultural contexts (Dietz & Shwom, 2017). For instance, a child who has grown up near water might perceive water play differently from a child with limited exposure to aquatic environments. Similarly, children who regularly climb trees might have different risk assessments of height-related activities compared to those who have had limited opportunities for such experiences.

Morrongiello and Lasenby-Lessard (2007) proposed comprehensive model of children's risk-taking behavior provides a sophisticated framework that extends beyond individual traits to encompass broader familial and social influences. Their integrative approach identifies multiple interconnected factors that shape children's risk-taking behaviors: family and parental influences, socialization processes, teaching methodologies, parental modeling behaviors, diverse parenting styles, individual parental characteristics, sibling dynamics and relationships

Cultural variations in risk perception manifest distinctly in childcare practices across different societies, highlighting how risk assessment is deeply influenced by cultural norms and traditions. Caregivers from Nordic countries, particularly Denmark, where parents routinely place infants outdoors to sleep in cold temperatures (New et al., 2005). This practice, rooted in cultural beliefs about its benefits for sleep quality and immune system development, illustrates how what one society considers beneficial might be viewed as dangerous in another cultural context.

The evolution of risk perception within societies over time further demonstrates its dynamic nature. A notable example is the shifting attitude toward children's independent mobility in Australia. While walking to school unaccompanied was once considered a normal part of childhood, contemporary parents and society generally view this practice as unacceptably risky without adult supervision (Cooke et al., 2021). This transformation in risk perception reflects broader societal changes in how childhood safety is conceptualized and managed. These contrasting examples highlight how risk perception is not universal but rather shaped by cultural contexts, historical periods, and societal values.

Understanding risk perception and management in children's play reveals a complex interplay of individual, familial, and societal factors that collectively shape how risk is perceived,

managed, and experienced. The evidence presented demonstrates that risk-taking in play is not merely a matter of individual choice or environmental conditions, but rather a sophisticated interaction between personal characteristics, parental influences, and broader cultural contexts.

Sex Influencing Risky Play

Research also suggests how the sex of the child also has an influence in the way children approach risk as well as parental expectations and responses to play that involves risks (Morrongiello,1998; Ginsburg & Miller, 1982; Morrongiello & Dawber, 1999; Morrongiello & Hogg, 2004). In a study by Ginsburg and Miller (1982) 480 children between the ages of 3 to11 were observed in four risky situations: an elephant ride, a feeding exhibit with a warning slip, a petting zoo and a steep river embankment and counted how may males versus females engaged in such behavior. Across all situations, significantly more boys took part in these risky behaviours. Research by Hillier and Morrongiello (1998) also revealed significant sex differences in children's risk-taking behaviors. Females typically perceived high-risk situations as more dangerous than males did. Moreover, they tended to attribute injuries to their own behavior, while males more often attributed injuries to chance or luck.

In their examination of socialization processes, Morrongiello and Dawber (1999) uncovered significant sex-based differences in how parents approach risk situations with their preschool children. Their research revealed a distinct pattern: parents tend to foster independence in boys by providing verbal instructions and encouraging autonomous problem-solving, while girls typically receive more direct physical assistance and safety-oriented warnings. This gendered approach to risk management reflects deeper societal patterns in how children are socialized to handle potentially dangerous situations.

Morrongiello and Hogg (2004) examined parental responses to risk-taking behaviors in children aged 6 to 10, focusing on whether parents prioritized safety or disciplinary issues when faced with potentially inappropriate or rule-breaking behaviors. The research uncovered notable sex differences in maternal reactions. Mothers predominantly felt anger when their sons misbehaved, only showing concern if the misbehavior resulted in at least moderate injury. In contrast, mothers experienced disappointment when their daughters misbehaved and expressed concern even for minor injuries resulting from such behavior. These findings highlight the complex interplay between parental emotions, gender expectations, and safety considerations in child-rearing, suggesting that maternal responses to children's risk-taking behaviors are influenced by both the child's gender and the perceived severity of potential consequences.

Decline of Risky Play

Decline in Outdoor and Free Play

The decline of children's play opportunities in the Western world has been well-documented, with recent studies highlighting a stark generational shift. A 2023 survey conducted involving 3,000 participants in England, revealed a significant decrease in outdoor play among children compared to previous generations (Play England, 2023). Only 25% of today's children regularly engage in outdoor play in their neighborhoods, a dramatic drop from the 75% reported by their grandparents' generation. This decline is even more pronounced when comparing age groups: 80.4% of adults aged 55-64 recall frequent street play during their childhood, while only 27% of current children participate in such activities. The reduction in play opportunities extends beyond residential neighborhoods to educational settings. In 1989, a survey by the National Association of Elementary School Principals found that 90% of U.S. school districts included some form of recess, typically occurring once or twice daily for 15 to 20 minutes. However,

mounting pressure to improve academic achievement and test scores has led to a significant decrease in recess time. Nearly 40% of the 16,000 U.S. school districts have either modified, eliminated, or are considering eliminating recess from their daily elementary school schedules (Pelligrini, 1995). This trend is not limited to the United States; in Canada, the 2010 Physical Activity Monitor reported a 14% decrease over the past decade in the proportion of children and youth engaging in outdoor play after school hours (ParticipACTION, 2010)

Safety Concerns and Overprotective Parenting

The decline in children's outdoor play can be attributed to a multitude of factors, with safety concerns emerging as one of the most significant. Parents' fears about their children's safety, particularly regarding the risk of abduction, have led to a substantial reduction in unsupervised outdoor play (Brussoni et al., 2012; Martin et al., 2017). However, these concerns often do not align with actual statistics on child safety. Research reveals a striking disparity between perceived and actual risks of child abduction.

Contrary to popular belief, stranger abductions are far less common than family abductions or those perpetrated by acquaintances (Shutt et al., 2004). Even more notably, stereotypical stranger abductions, the kind most feared by parents, are exceptionally rare, with those resulting in homicide being extraordinarily uncommon. This misperception of risk has led to an overprotective approach that significantly limits children's outdoor activities. Statistical evidence further supports the notion that child abduction risks are decreasing. In Canada, for instance, the child abduction rate for children and youth under 14 years of age (excluding abductions by parents or guardians) saw a substantial decline of 27% between 2011 and 2014 (Statistics Canada, 2016). The number of children missing has reduced from 1987 to 2023 has been reduced by approximately 40% (Missing Children Society of Canada, 2024). Moreover,

stranger abductions are very rare in Canada. In 2023, there were 50 reported stranger abductions (Missing Children Society of Canada, 2024). This downward trend in abduction rates contrasts sharply with the increasing restrictions placed on children's outdoor play, highlighting a disconnect between actual safety improvements and parental perceptions of risk.

Parental safety concerns significantly influence children's engagement in outdoor and risky play, with research indicating a strong relationship between parenting styles and children's play behavior. Overprotective parenting has been found to restrict children's outdoor play activities (Sak et al., 2023). This trend is evident across various cultural contexts. For instance, a study of 890 parents of 3 to 4-year-olds in Turkey revealed that overprotective and permissive parenting styles led to fewer opportunities for children to engage in risky play. Parents also do not leave their children alone due to a complex interplay of moral judgements and societal norms and the fear of being criticized (Thomas et al., 2016). A study involving 26 early childhood educators and 112 parents in rural and metropolitan areas of Australia and the United States found that safety concerns and the child's young age were the most cited reasons for not allowing children to take risks (McFarland & Laird, 2018). Interestingly, parental education levels also play a role in shaping attitudes towards risky play. More formally educated parents tend to better understand the benefits of outdoor play and are generally more encouraging of such activities compared to those with less formal education (Boxberger & Reimers, 2019). The impact of parental attitudes and wider societal norms extends beyond individual families to educational settings (Cevher-Kalburan, 2016).

A study conducted by Sandseter and Sando in 2016 in Norway observed that previously permissible activities in early childhood centers are now being restricted due to new safety

measures. This shift is largely attributed to pressure from parents, local inspectors, and media, reflecting a broader societal trend towards risk aversion in children's play.

Institutionalization of Childhood

The increasing institutionalization of children's lives has led to significant changes in how children spend their time and engage in play. As Tovey (2007) observes, children are entering formal education settings at younger ages, with more time spent in nurseries, childcare, and after-school programs. This shift has resulted in a greater proportion of children's play occurring under adult supervision, becoming increasingly structured and organized by adults. The consequence is a reduction in opportunities for free, unstructured play that is crucial for children's development.

Increase in Screen Time

Concurrently, the rising prevalence of screen use among young children is reshaping their daily activities, impacting physical activity levels, sedentary behavior, and sleep patterns. In Canada, the statistics are particularly striking, with only 15% of children watching less than one hour of television per day (Carson et al., 2020). While digital devices can offer educational benefits for children over two years old when used with quality content, there is growing concern about the displacement of outdoor play time by screen-based activities. This substitution of outdoor play with digital engagement interferes with the promotion of a healthy lifestyle and can have far-reaching consequences on children's development. Research indicates that excessive screen time can negatively affect social learning and emotional regulation in young children

Balancing Safety and Challenge in Play Environments

Although risk-averse practices are implemented with good intentions, they ultimately hinder child development (Harper, 2017; Stephenson, 2003). While adults responsible for

children's safety often focus narrowly on preventing physical injuries, they may overlook a range of other potential dangers that can arise from overly restricting active play (Bundy et al., 2009).

With a nuanced and balanced perspective, Stine (1997) recognizes the crucial role of challenge in fostering competence, while emphasizing the need for a delicate balance between offering risk and challenge on one hand and providing repetition and security on the other in playground design. She notes that the same element might present a stimulating challenge for one child but pose a hazard for another, due to variations in developmental abilities and skills.

In conclusion, a risk-averse society and over scheduled lives have led to the elimination of many opportunities for children to engage in beneficial risky play, potentially hindering essential learning and developmental experiences. There is a need for an evidence-informed foundation from which responsible initiatives can be designed to promote healthy child development through active outdoor play, balancing safety concerns with developmental benefits.

Social Emotional Learning (SEL)

Definition and Components of Social Emotional Learning (SEL)

Social Emotional Learning (Learning) is the process through which all young people and adults acquire and apply the knowledge, skills, and attitudes to develop healthy identities, manage emotions and achieve personal and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions (Collaborative for Academic, Social and Emotional Learning [CASEL], 2007). It is a combination of intra-personal, interpersonal and responsible decision-making skills and is broadly defined through five components (CASEL, 2007). Self-awareness and management include the ability to recognize and manage one’s emotions, thoughts and behaviors while social

awareness and relationship skills focus on ability to understand other people and maintain healthy relationships. Responsible decision-making involves problem-solving, weighing consequences, and making decisions in context of their social environment.

Outcomes Associated with Social Emotional Learning (SEL)

There is ample evidence to make a case for promoting SEL in classrooms. As per a meta-analysis that looked at 50 years of research about the effectiveness of universal school based social and emotional learning programs for improving programs, it was found that SEL produced positive effect on reading, mathematics and science (Corcoran et al., 2018). It is to be noted that strong foundations at school entry is fundamental to later academic success (Romano et al., 2010). Moreover, children who have positive SEL development in early years are more likely to have better mental health outcomes and be successful in their personal and professional relationships (Daines, 2021). Learning is a social process, yet entry into formal academic settings can be challenging for young children because of expectations such as sitting still and following instructions (Denham et al., 2012).

Measurement of Social Emotional Learning (SEL)

Traditional measurement approaches of SEL focus on specific components of SEL and provide outcomes for the average child, offering a fragmented view of children. Yet children's social and emotional lives usually involve patterns of co-occurring strengths and difficulties, rather than single problems emerging on their own (Denham et al., 2014; Robson et al., 2020). Person-centred studies address this limitation by identifying distinct social-emotional profiles that combine multiple domains which reflect the true nature of the children in classrooms. These profiles are then used to predict later mental health, school engagement, and academic achievement (Collie, 2018; Cook et al., 2019; Duncan et al., 2019; Low, 2016; Thomson, 2018).

If children's SEL tends to organize into profiles, these patterns are likely to shape both their opportunities for and dispositions toward risky play.

Thomson et al. (2019) used the Early Development Instrument to capture eight teacher-rated aspects of children's social-emotional health, including social competence, responsibility and respect, readiness to explore, prosocial behaviour, anxiety, aggression, and hyperactivity. Applying latent profile analysis to a population sample of 35,818 kindergarten children in British Columbia, they identified six SEL profiles that combined these indicators into meaningful patterns such as "overall high functioning," "inhibited-adaptive" (socially competent but low in exploration), "uninhibited-aggressive/hyperactive," and "overall low functioning" (p.5). These profiles were not rare anomalies: over 40% of children showed some form of social-emotional vulnerability, and about 9% had marked co-occurring aggression and hyperactivity. In this study the importance of looking at combined patterns rather than isolated problems was showcased. The study also showed that boys, children from lower-income households, and children with English as a second language had higher odds of membership in several lower-functioning profiles, although vulnerabilities still appeared across all sociodemographic groups. For measurement, this demonstrates that profile-based SEL approaches can reveal both clusters of risk and pockets of strength (for example, high readiness to explore despite behaviour problems), which is directly relevant for understanding how different SEL constellations might foster or constrain children's engagement in risky play.

The Connection between Risky Play and Social Emotional Competency

Risky Play as a Context for Social Interaction and Emotion Regulation

Being effective in a variety of social interactions requires children to master many skills that underlie social competence. Emotional regulation, perspective taking and problem solving

seems to be key skills that are essential to develop social competence (Junge et al., 2020; Hay et al., 2004; Raver & Zigler, 1997; Rose-Krasnor, 1997; Vink et al.,2020). Between the ages of 2 – 5, social interactions become more varied and complex. There are rudimentary beginnings of perspective-taking skills, prosocial behavior emerges like sharing and helping emerges, children play in dyads with age-mates, but under control by parents, play progresses from parallel play to social play and children are sensitive to positive peer status (Junge et al., 2020).

Risky play offers a unique social context to develop and practice skills to develop this. Children's exposure to risk and emotion develops the prefrontal cortex, which is a part of which is responsible for decision making, reasoning, personality expression, maintaining social appropriateness, and other complex cognitive behaviors (Arnsten, 2009). This development enhances the children's ability to make appropriate social decisions and engage more in social interactions.

When children climb, swing, roll, or slide they tend to do this together with other children and while doing so they collaborate with others while participating in these challenging activities and need to read each other's social and bodily signals (Bahrenscheer & Sederberg, 2019). Using both verbal and non-verbal signals helps them be part of meaningful communities (Sandseter, 2015). Risky play also offers children to engage in a variety of emotions, from excitement to thrill to fear and anxiety (Sandseter et al., 2022). As children learn to regulate these, they develop the competence necessary for social interactions. These experiences also help children develop confidence as they overcome fear (Tsujitani, 2024). When children participate in risky play, they not only dare to challenge themselves but also challenge others to take risks leading to overall confidence of a group (Bahrenscheer & Sederberg, 2019).

The relationship between outdoor risky play and child development has emerged as a significant area of research interest in recent years, though gathering empirical evidence presents unique methodological challenges. While studies have documented numerous benefits of outdoor play in general (Dillon et al., 2016; Kiviranta et al., 2024), the specific impacts of risky play are more challenging to measure through traditional research methods. This limitation stems from ethical considerations that preclude experimental designs that would involve deliberately restricting children's play opportunities. However, there has been some promising positive evidence to support the effect of risky play on social competencies.

One study by Brussoni et al. (2017) in Vancouver, Canada focused on prosocial behaviors in early years by modifying play areas to increase opportunities for risky play. In the study, 45 children between ages 2 – 5 were exposed to increased opportunities to nature and risky play in the outdoor play environment. Their findings suggested that children who had access to these modified play spaces demonstrated increased prosocial behaviors. Prosocial behaviours are one of the behavioural dimensions of social competence (Schneider, 1993). Furthermore, in the same study Early Childhood Educators observed improvements in children who had access to these modified play spaces on a range of skills - socialization, problem-solving, focus, self-regulation, creativity, and self-confidence, along with reduced stress, boredom, and injury rates. Exploring specific types of play, researchers have found varying impacts on children's emotional development**.** The teachers in this case also reported that children engaged in more independent play and that their interactions with children were of higher quality.

The importance of independent outdoor play has also been highlighted in smaller-scale studies. A study conducted in Zurich, involving 20 families, examined the effects of independent

outdoor play on children's social development (Hüttenmoser, 1995). The researchers found that children with access to suitable outdoor play areas and the freedom to play without adult supervision—a scenario that includes the risk of getting lost—demonstrated improved social behavior and enhanced problem-solving skills. Additionally, these children reported participating in more shared activities with friends without the supervision of an adult. New research supported this finding that unsupervised play in children serves helps children develop the skills of communication, perspective taking, and emotion regulation (LaFreniere, 2011).

A systematic review by Brussoni et al. (2015) revealed compelling evidence linking independent outdoor risky play to enhanced developmental outcomes. The review specifically examined play scenarios where children could explore freely, including situations where they might temporarily "get lost" or move beyond immediate adult supervision. The study concluded that when children have opportunities to navigate space independently, even with the possibility of temporarily losing their bearings, they develop crucial skills in spatial awareness, decision-making, and self-reliance. These experiences contribute to children's growing sense of competence and autonomy while fostering physical activity and social interaction skills.

Lindsey and Colwell (2013) conducted a longitudinal study to investigate different types of pretend and physical play. By analyzing the data of 122 preschool children who attended preschool 2 years consecutively in the US in their natural environments, they concluded that rough-and-tumble play, which is one kind of risky play, predicted children's emotional expressiveness and emotion regulation one year later. This supports previous findings that rough and tumble requires someone to identify their emotion, express their and their partners emotion (Pellegrini, 1988).

However, the relationship between play and social competencies is not always straightforward. Pellegrini (1991) found that associations between rough-and-tumble play and problem-solving abilities were mediated by children's social status, leading to inconclusive evidence about the direct impact of such play on social behaviors.

Bundy et al. (2017) conducted a cluster-randomized controlled trial was conducted in Sydney, Australia, between 2009 to 2010 to examine the effects of an intervention on children's play behavior. The intervention consisted of two components: introducing recycled materials without an obvious play purpose into school playgrounds and conducting a risk-reframing workshop for parents and teachers. The cluster involved 12 primary schools as clusters. The schools were randomly allocated to either intervention or control conditions. A total of 226 children, aged 5-7 years, were randomly selected to participate in the study. Data were collected at baseline and after a 13-week intervention period. While the intervention group showed an 11.8% increase in observed play time compared to the control group, this difference was not statistically significant ($p = .08$). However, the effect size ($d = 0.27$) for both play and nonplay activities suggests that the intervention had a small to medium, clinically meaningful impact. This indicates that the changes observed in play behavior, although not meeting the threshold for statistical significance, may still be important in practical terms. The intervention did not significantly alter the number of playmates ($p = .31$), suggesting its primary effect was on play duration rather than social aspects of play. These results highlight the importance of considering both statistical and clinical significance when evaluating interventions in child development research.

Bidirectional Relations Between SEL and Risky Play

While much of the existing research frame risky play as a pathway to improved social-emotional outcomes, transactional models of development emphasize that child characteristics and environments influence each other over time in bidirectional ways (Neece et al., 2009; Sameroff, 2009; Shanahan & Bauer, 2004). From this perspective, children's existing social-emotional functioning is likely to shape the risky play opportunities adults provide and how children use those opportunities, even as engaging in risky play may, in turn, support emotion regulation and social competence.

Rationale for the Proposed Study

The literature review highlights the crucial role of play in child development, highlighting its multifaceted benefits across social, emotional, cognitive, and physical domains (Alden & Pyle, 2019; Sutton-Smith, 1997). Risky play, characterized by activities that involve a degree of thrill and potential physical injury, is particularly noted for its ability to enhance social skills, emotional regulation, and resilience in children (Sandseter, 2009; Stephenson, 2003). Among other positive developmental outcomes, suggestions of improved resiliency and adaptability may be likely from outdoor risky play in childhood (Brussoni et al., 2015, Harper, 2017, Sandseter & Kennair, 2011; Wells & Evans, 2003). Friendships are not formed in the cooperative setting of classrooms, but in play (Hartup, 1996). Despite these recognized benefits, there is a paucity of empirical research specifically linking risky play to SEL in early childhood.

The rationale for this study is grounded in several key considerations. First, play is universally acknowledged as vital for holistic child development, with risky play offering unique opportunities for children to navigate challenges and develop problem-solving skills (Sandseter & Kennair, 2011). Second, children's early social-emotional learning (SEL), including

self-regulation, prosocial behaviour, and internalizing and externalizing difficulties, predicts later behaviour, classroom adjustment, and academic readiness, suggesting that SEL is a powerful driver of children's trajectories at school entry (Graziano, 2007; Johnson et al., 1995). Third, theoretical and empirical work supports transactional models in which children and their environments influence each other over time, implying that relations between SEL and risky play are likely bidirectional: children's existing SEL may shape the risky-play opportunities adults provide and how children engage with them, even as risky play, in turn, can support or undermine emerging social and emotional competencies (Sameroff, 2009; Shanahan & Bauer, 2004; Canadian Paediatric Society, 2024; Sandseter & Kennair, 2011; Brussoni et al., 2015).

The present study responds to the identified gap in social learning outcomes of risky outdoor play (Brussoni et al., 2015) by adopting a transactional perspective and a person-centred approach to examine how early SEL profiles relate to children's opportunities for, and dispositions toward, risky play. Addressing this gap could inform educational practices and policies aimed at fostering environments that balance safety with developmental growth. Furthermore, the study responds to concerns about the decline in outdoor play opportunities due to modern lifestyle constraints and safety fears (Play England, 2023; Harper, 2017). In doing so, it offers more nuanced, evidence-based insight into which groups of children are most likely to access the developmental benefits of risky play and how existing SEL profiles may shape those experiences, informing educational practices and policies that seek to balance safety with developmental growth. This research is both timely and relevant, offering potential evidence-based strategies that can help support crucial skills needed for children to thrive in kindergarten and beyond.

Chapter Two Summary

This chapter reviews the relevant literature on play, particularly risky outdoor play, and its impact on child development. It explores the various definitions of play, highlighting its critical role in social, emotional, cognitive, and physical development. The chapter emphasizes the importance of risky play, defined as thrilling activities with potential for physical injury, and its six categories as identified by Sandseter (2007).

The literature review examines the evolutionary and psychological perspectives on why children engage in risky play, including its role in overcoming innate fears and developing coping strategies. Studies have shown various benefits of risky play, including improved prosocial behaviors, problem-solving skills, emotional regulation, and overall well-being.

However, the chapter also highlights a significant decline in children's outdoor play opportunities in Western societies, attributed to safety concerns, overprotective parenting, increasing institutionalization of children's lives, and rising screen time. This decline is concerning given the potential developmental benefits of risky play.

The review identifies a specific gap regarding how risky outdoor play relates to children's social-emotional learning and social competencies at the transition to kindergarten, and how these relationships may be bidirectional. Given the importance of SEL for successful adaptation to formal schooling and emerging evidence that children's SEL profiles shape, and are shaped by, their everyday experiences, the chapter motivates the present study's use of a person-centred LCA approach to examine links between risky outdoor play and social-emotional functioning as children enter kindergarten. By focusing on bidirectional relations between risky play and SEL profiles at kindergarten entry, the present study aims to clarify which children are most likely to experience and benefit from risky outdoor play in early childhood contexts.

Chapter Three: Methodology and Methods

Chapter Three Overview

The purpose of this retrospective cohort study is to examine how distinct social-emotional learning (SEL) latent classes in kindergarten-aged children are associated with their predisposition to engage in outdoor risky play and investigate the extent to which these associations are mediated by opportunities for outdoor risky play, and whether sex is a moderator of these mediations. The study employs a retrospective cohort design, utilizing secondary, anonymized data from the Childhood Experiences Questionnaire (CHEQ) and the Early Development Instrument (EDI) provided by the Human Early Learning Partnership (HELP). This chapter provides a framework for the study, outlining the purpose, research questions, design, methodology, processes, ethical procedures, and analytic approach used to address the study objectives.

Purpose of the Study

The purpose of this retrospective cohort study is to examine how distinct social-emotional learning (SEL) latent classes in kindergarten-aged children are associated with their predisposition to engage in outdoor risky play and investigate the extent to which these associations are mediated by opportunities for outdoor risky play, and whether sex is a moderator of these mediations. Specifically, this research aims to:

1. Identify and describe SEL latent classes among children in kindergarten and compare their predisposition to engage in outdoor risky play.
2. Examine the extent of the association between SEL latent classes and children's predisposition to engage in risky play and which these associations are mediated by opportunities for outdoor risky play.

3. Examine whether sex is a moderator of these mediations.

Together, these objectives will clarify how distinct patterns of SEL relate to young children's engagement in outdoor risky play and the conditions that support it. The findings are expected to inform how educators, parents, and policymakers identify which groups of children tend to participate less in beneficial risky play, tailor supports to different SEL profiles.

Research Questions

Based on the purpose of the research, the two research questions are:

1. Which distinct social emotional learning (SEL) latent classes emerge among kindergarten children, and how are these classes associated with their predisposition to risky play?

   Null Hypothesis: There is no difference in children's predisposition to risky play across SEL latent classes.

   Research Hypothesis: Latent class differs in predisposition to risky play.

2. To what extent are associations between SEL latent classes and children's observed risky play mediated by children's opportunities for risky play?

   Null Hypothesis: There is no mediated effect of SEL latent class on risky play through opportunities for risky play.

   Research Hypothesis: There is significant mediated effect of SEL latent class on risky play through opportunities for risky play.

3. Does the mediating pathway via children's opportunities for risky play between SEL latent classes and children's observed engagement in risky play differ for males and females?

   Null Hypothesis: The mediated association of SEL latent class with children's observed risky play engagement via opportunities for risky play does not differ by sex.

Research Hypothesis: The mediated association of SEL latent class with children's observed risky play engagement via opportunities for risky play differs by sex.

Research Design

This study employed a retrospective cohort design using latent class analysis (LCA). LCA is a person-centred analytic approach used to identify unobserved subgroups within a population based on individuals' response patterns across multiple indicators (Weller, Bowen, & Faubert, 2020). A person-centred latent class approach was chosen because the goal was to identify qualitatively distinct profiles of children's social-emotional functioning rather than estimate average effects on individual EDI social and emotional subscales. This aligns with Bergman and Magnusson's (1997) argument that development is best understood in terms of patterns of operating factors within individuals, and that many systems naturally give rise to a limited number of frequently observed 'types' or constellations, and classification methods such as Latent Class Analysis (LCA) are designed to uncover. In this study, LCA was used to determine whether there were distinct social-emotional learning (SEL) classes among children in kindergarten and to examine how these classes were related to children's predisposition to engage in outdoor risky play.

An aim of the study was to identify SEL latent classes (independent variable) and assess whether class membership was associated with children's predisposition to outdoor risky play (dependent variable). The patterns of SEL class membership were examined in relation to children's predisposition to outdoor risky play, with opportunities for outdoor risky play modeled as a mediator of these associations and sex included as a moderator of the mediated pathways.

Retrospective cohort studies are relatively inexpensive and can be completed more quickly than prospective cohort studies, allowing for efficient use of existing data (McKenzie, 2005). Utilizing secondary, anonymized data from the Childhood Experiences Questionnaire (CHEQ) and the Early Development Instrument (EDI) provided by the Human Early Learning Partnership (HELP), the research aimed to provide insights into how early SEL profiles and contextual factors relate to children's predisposition to engage in risky play (Human Early Learning Partnership, 2026). Because the dataset also captured sex, as well as information on opportunities for risky play, it allowed examination of how these factors influenced both SEL class membership and risky play predisposition. This approach enabled a comprehensive analysis of existing data, identifying potential patterns and associations that can inform educational practices and policies to support healthy social-emotional development and developmentally appropriate outdoor risky play opportunities.

Procedures

Ethics and Consent

Ethics approval for this study was obtained through the Behavioral Research Ethics Board (BREB) at the University of British Columbia (H24-03958)**.** Since the research utilizes secondary data from the Childhood Experiences Questionnaire (CHEQ) and the Early Development Instrument (EDI), ethical considerations focused on data security and confidentiality.

Data Storage and Security

All data was securely stored in Population Data BC's Secure Research Environment (SRE). No individual data was exported. All other outputs were saved on UBC's Microsoft

OneDrive, ensuring compliance with FIPPA standards. This platform provided robust encryption and secure storage within Canada, protecting against unauthorized access.

Data Anonymization

The dataset analyzed in this study consisted of pre-existing, anonymized records. Identifiable information had been removed by the data custodian before access was granted, and I did not have access to any linkage keys that would permit re-identification of participants.

Access Control

Access to the data was restricted to authorized personnel only with the utilization of a Yubi Key. Permissions were managed to ensure that only those directly involved in the research have access.

Data Collection from The Human Early Learning Partnership

With the support of my research supervisor, Dr. Laurie Ford, a formal request was submitted to HELP to obtain access to the linked CHEQ and EDI datasets (Figure 1). This linked data was already available. This request included a detailed description of the study's objectives and how the data will be used. A Data Security Plan was also submitted to ensure that it meets the required standards to obtain and utilize the data.

Data Inclusion Criteria

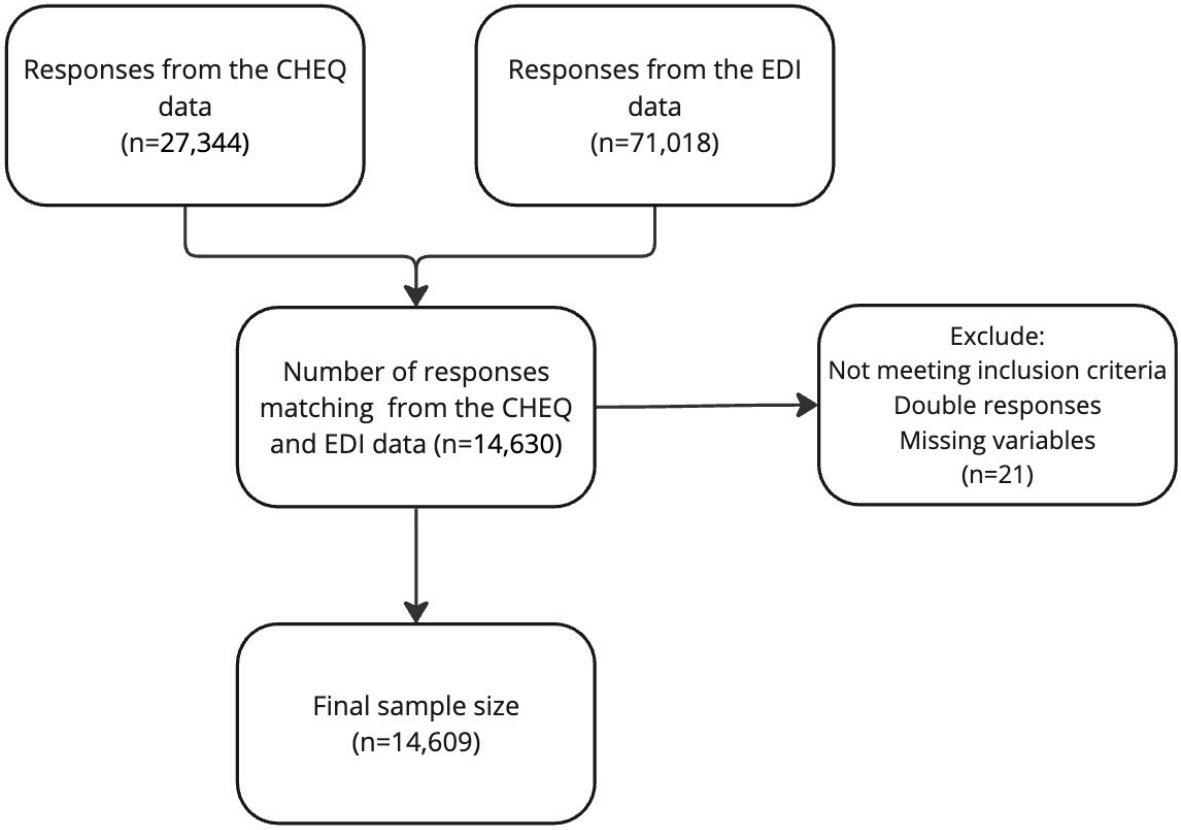
The data inclusion criteria were as follows:

- Children in Kindergarten: Children enrolled in kindergarten at the time the instruments were completed.
- Geographical Location: All children in BC.
- Data Availability: Utilize datasets where both CHEQ and EDI data are available for the same child, ensuring comprehensive analysis.

- Data Completeness: Dataset with complete information on relevant variables, including outdoor risky play, social competencies, sex, and to maintain the integrity and validity of the analysis.

Figure 1

Flow Diagram of the Participant Inclusion Process



Instrumentation

The Childhood Experiences Questionnaire (CHEQ)

The Childhood Experiences Questionnaire (CHEQ) is completed by parents or caregivers whose child is about to enter Kindergarten and gathers important information about family context and children's experiences prior to kindergarten. This information is gathered so that schools and communities can support children and families and ensure a solid foundation for

healthy development and well-being (HELP, 2026). There are 55 questions on the CHEQ that assess five domains: physical health & well-being, language & cognition, social & emotional experiences, early learning & care, and community & context. The domains and sub domains can be found in Appendix A. The survey is completed online and takes 15 minutes for parents and caregivers to fill out. Participation in completing the survey is voluntary. For the current study, this questionnaire gives information on the predisposition of children to risky play, frequency of outdoor risky play and the child's sex. The two questions utilized for this study were: (1) a disposition item, "When given the chance, your child likes to take risks when playing outside (for example, climb up as high as they like, playing chase, play-fight, or ride a bike really fast)," and (2) an opportunity item, "In the last 6 months, how often did your child have a chance to do this?" As these were single-item measures drawn from an established population-level questionnaire, internal consistency coefficients (e.g., Cronbach's alpha) were not estimated; instead, these items are interpreted in light of the broader validity and feasibility evidence for the CHEQ as a parent-report tool on pre-kindergarten experiences.

The Early Development Instrument (EDI)

The Early Development Instrument (EDI) is a questionnaire developed in 2000 by Dr. Dan Offord and Dr. Magdalena Janus at McMaster University in Hamilton, Ontario. The EDI data has 103 core items and is typically used to measure the developmental competencies of children at the population level. It has been used over the last 25 years in British Columbia (BC) to support local, regional and province wide conversation, action and investment. It is completed by kindergarten teachers for the students in their classrooms during each February of the school year. The EDI assesses children's readiness to learn at school across five domains: physical health and well-being, social competence, emotional maturity, language and cognitive

development, and communication skills and general knowledge. Within these domains, 15 subdomains have been identified: three for physical health and well-being (physical readiness for the school day, physical independence, gross and fine motor skills), four for social competence (responsibility and respect, approaches to learning, overall social competence, readiness to explore new things), four for emotional maturity (prosocial and helping behaviour, hyperactivity and inattention, anxious and fearful behaviour, aggressive behaviour), four for language and cognitive development (basic literacy skills, interest in literacy/numeracy and memory, advanced literacy skills, basic numeracy skills). The communication skills and general knowledge domain has no subdomains. Items are rated by teachers on ordered categorical scales and averaged within each subscale to yield subscale scores, which are combined into domain scores, with higher scores representing more advanced competencies or, for difficulty-focused subscales (e.g., hyperactivity and inattention, anxious and fearful behaviour, aggressive behaviour), greater difficulties. In line with previous research, the EDI has demonstrated solid psychometric performance in different provinces and study settings. In Canadian samples, the five EDI domains show good internal consistency, with Cronbach's alpha values typically falling between 0.84 and 0.94, and test–retest reliability estimates ranging from about 0.80 to 0.90 (Janus & Offord, 2007). Means and Standard deviations are provided below in Table 1. Children who are flagged as developmentally vulnerable on one or more of the five EDI domains in kindergarten are more likely to experience weaker academic achievement and less favourable social and emotional outcomes as they progress through elementary school (Brinkman et al., 2013; Guhn et al., 2016). For this study, the EDI provided the data on the eight social and emotional competencies that children have upon entry in kindergarten.

Table 1

EDI Social Emotional Subscales: Means and Distribution

EDI Subscale	Unstandardized Mean (Standard Deviation)
Overall social competence	1.23 (0.70)
Respect and responsibility	1.61 (0.66)
Approaches to learning	1.43 (0.72)
Readiness to explore	1.75 (0.49)
Prosocial and helping behaviour	0.95 (0.83)
Anxious and fearful behaviour	1.73 (0.56)
Aggressive behaviour	1.66 (0.69)
Hyperactive and inattentive behaviour	1.44 (0.81)

Note. Emotional Subcales: prosocial and helping behaviour. Anxious and fearful behaviour, aggressive behaviour and hyperactive and inattentive behaviour are reverse coded to indicate better emotional functioning.

Measurement Timing and Instrumentation

The CHEQ was completed by caregivers at the start of the kindergarten year, whereas the EDI was completed by teachers in February of the same school year. Consequently, the dependent variable (children's disposition toward risky play, drawn from the CHEQ) was recorded before the independent variable (SEL profiles based on the EDI), which is atypical for regression analyses in which outcomes are usually observed after predictors. However, the EDI is designed to capture children's readiness for school as it is expressed during that kindergarten year. Both the CHEQ and EDI therefore are aspects of the same developmental 'moment' in

children's lives. The regression models should are hence interpreted as describing associations between SEL profiles and predisposition to risky play, rather than as providing evidence of prediction or causal effects.

Research Question and System Alignment

Table 2

Research Questions (RQ) Alignment

Variables	Design	Instrument	Validity & Reliability	Source
RQ 1: Which distinct social emotional learning (SEL) latent classes emerge among kindergarten children, and how are these classes associated with their predisposition to risky play?				
DV: Predisposition to outdoor risky play (derived from CHEQ) IV: SEL latent classes (derived from EDI)	Latent class analysis and linear regression	DV: Childhood Experiences Questionnaire (CHEQ) IV: The Early Development Instrument (EDI)	The mean, standard deviation, and class probabilities will be reported; goodness-of-fit indices (e.g., BIC, entropy) will be used to select the optimal class solution.	CHEQ - Parent or caregiver EDI – educator
RQ 2: To what extent are associations between SEL latent classes and children's observed risky play mediated by children's opportunities for risky play?				
DV: Predisposition to outdoor risky play (derived from CHEQ) IV: SEL latent classes (derived from EDI), sex and opportunity for risky play (derived from CHEQ)	Mediation analysis	DV: Childhood Experiences Questionnaire (CHEQ) IV: The Early Development Instrument (EDI) and Childhood Experiences Questionnaire (CHEQ)	The mean, standard deviation, and relevant model parameters like indirect effects will be reported for this analysis	CHEQ - Parent or caregiver EDI – educator

RQ 3: Does the mediating pathway via children's opportunities for risky play between SEL latent classes and children's observed engagement in risky play differ for males and females?				
DV: Predisposition to outdoor risky play (derived from CHEQ) IV: SEL latent classes (derived from EDI), sex and opportunity for risky play (derived from CHEQ)	Mediation analysis with a moderator	DV: Childhood Experiences Questionnaire (CHEQ) IV: The Early Development Instrument (EDI) and Childhood Experiences Questionnaire (CHEQ)	The mean, standard deviation, and relevant model parameters like indirect effects will be reported for this analysis	CHEQ - Parent or caregiver EDI – educator

Procedures to Ensure Trustworthiness, Reliability and Credibility

Since it is a quantitative study, objectivity was the key criteria for establishing trustworthiness, reliability and validity. The use of secondary data from the Childhood Experiences Questionnaire (CHEQ) and the Early Development Instrument (EDI) ensured that the data is reliable and collected through standardized methods. Detailed documentation of data analysis procedures will be maintained, allowing for replicability and verification of results. Validity is also about the correctness or truthfulness of any inferences made from research (Johnson & Christensen, 2020). Keeping this in mind, I have taken feedback from my research supervisor, committee members and lab members to ensure that the inferences I drew align to the statistical findings. Cohen et al. (2018) define reliability as an umbrella term for dependability, consistency and replicability over time, over instruments and over groups of respondents. In using the Childhood Experiences Questionnaire (CHEQ) in this study, I draw on this definition to acknowledge that CHEQ functions as a population-level monitoring tool whose psychometric work is ongoing; therefore, while CHEQ offers rich information about children's

pre-kindergarten experiences, claims about its reliability and validity must be made cautiously and situated within this emerging evidence base. The Early Development Instrument (EDI) has demonstrated strong reliability and multiple forms of validity across Canadian and international samples (Janus & Offord, 2007; Janus et al., 2021). In sum, by adhering to rigorous methodological standards, maintaining transparency in data handling, and seeking feedback, I have held high levels of objectivity, reliability, and validity throughout the research process.

Data Analysis

Identifying Latent Class Groups

Latent class models were estimated in Mplus Version 8.3 using EDI social-emotional subdomain scores as the class indicators. In the HELP dataset, both the original raw EDI social-emotional subscale scores and derived three-category readiness ratings were available. The three-category ratings represent the underlying continuous subscale scores, based on criterion-referenced cut-offs for school readiness. These readiness ratings classify children as not ready, somewhat ready, or ready for school and were preferred because they provide a more intuitive interpretation than raw scores or z-scores. For the latent class analysis, we used the "ready for school" category (children scoring 3 on each subdomain) as the reference for classifying patterns of social-emotional readiness. Using the readiness ratings also allowed the results to be framed from a strengths-based perspective that emphasizes readiness rather than deficits. These ordered categorical variables were used as indicators of the latent social-emotional learning (SEL) construct. A series of models specifying an increasing number of classes was fitted stepwise, beginning with a one-class model and adding additional classes sequentially, for a total of ten models (one- through ten-class solutions).

Consistent with best-practice recommendations for class enumeration, competing models were compared using adjusted BIC, entropy, smallest class size proportion and average posterior probabilities, and the final class solution was selected based on a balance of statistical fit and substantive interpretability (Nylund-Gibson & Choi, 2018). Candidate solutions were further evaluated through visual inspection of class-profile plots to assess the distinctness, size, and practical interpretability of the classes, rather than relying solely on a single fit index.

Once the optimal SEL latent class solution was identified, most-likely class membership and associated posterior probabilities were saved and exported from Mplus into SPSS 29.0.1.0, where they were linked with CHEQ variables to examine associations between SEL latent classes with other variables.

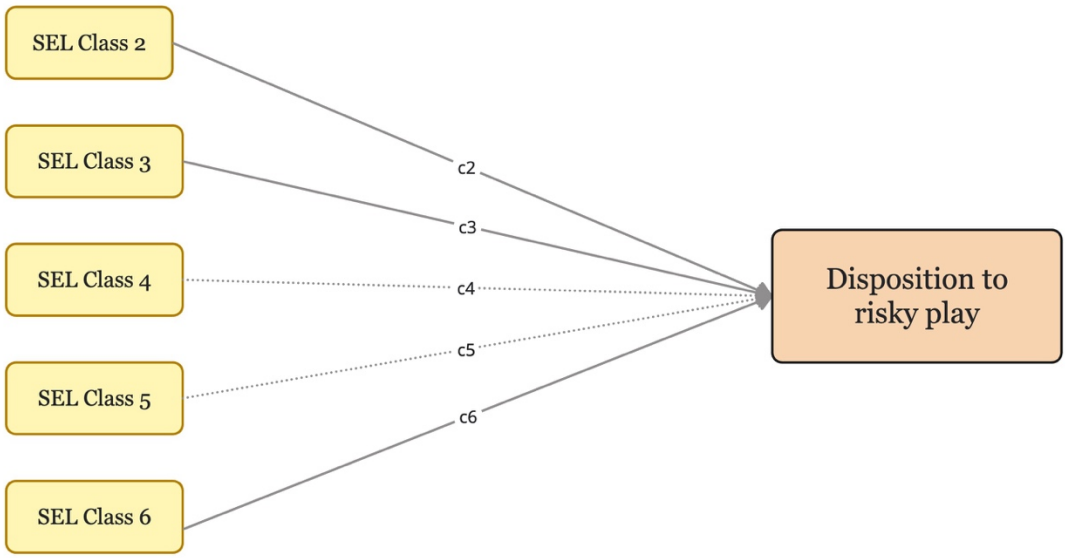
Association of SEL Classes with Risky Play

In all regression models, Class 1 served as the reference group against which the other SEL classes were compared. Associations between latent class membership and children's predisposition to outdoor risky play were then examined in SPSS. After the SEL classes were established, the mean distribution of children's disposition toward risky play and their opportunities for risky play across the six groups was examined. This analysis quantified how strongly each SEL profile was associated with these behaviours. Using mean scores allowed the central tendency within each class to be described and patterns of risky play to be compared across classes, with Class 1 serving as the reference group. This approach enabled assessment of whether specific SEL profiles were linked to higher or lower engagement in risky play.

Then, a total-effects model was estimated to examine the overall association between SEL class membership and children's disposition toward risky play and to assess how this pattern compared with the mean distributions of risky play across the SEL classes (Figure 2).

Figure 2

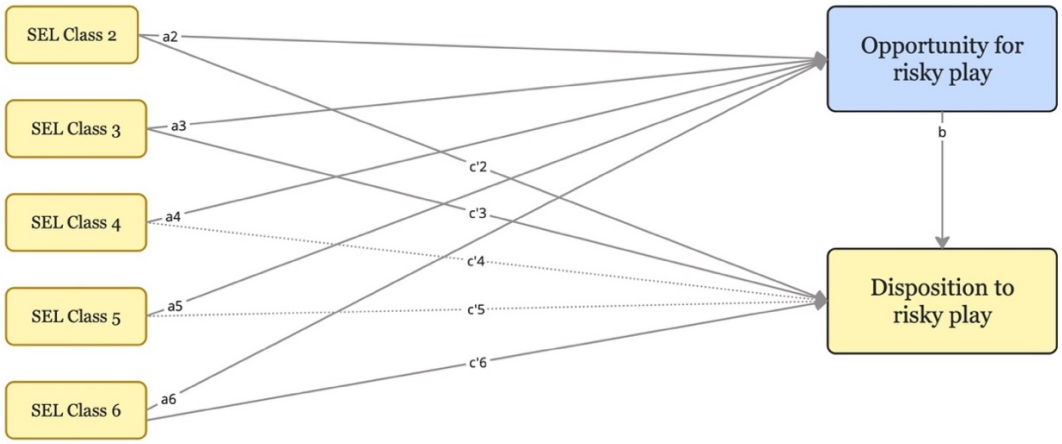
Total-effects Model linking SEL Latent Class Membership to Disposition Toward Risky Play



Next, mediation analyses were used to examine how SEL class membership (X) was related to children's disposition toward risky play (Y), and the extent to which this association operated through opportunity for risky play (M; Figure 3). In this study, mediation is conceptualized as a process in which the association between independent and dependent variables is transmitted through a third variable, or mediator (Wu & Zumbo, 2008).

Figure 3

Mediated Relation between SEL Class and Disposition Toward Risky Play via Opportunity for Risky Play



First, total effects were estimated by regressing disposition toward risky play on SEL class indicators only, providing the overall difference in disposition between each SEL class and the reference group. Next, direct effects were obtained from models that included both SEL class and opportunity for risky play; these coefficients represent the remaining association between SEL class and disposition after accounting for differences in opportunities. Indirect effects were calculated as the product of the path from SEL class to opportunity (a) and the path from opportunity to disposition (b), and their significance was assessed using the Sobel test. The proportion of the total effect attributable to opportunity for risky play was approximated by the ratio of the indirect to the total effect (ab/c), indicating how much of each SEL class difference in disposition toward risky play could be explained by variation in children's opportunities for risky play.

Moderation Analysis with Sex

Next, moderated mediation analyses were conducted to examine whether the association between children's opportunity for risky play (M) and their disposition toward risky play (Y) differed by sex, and whether the indirect effect of SEL predictors through opportunity varied for males and females. Moderation is conceptualized as a process in which the strength or direction of the association between independent variable and dependent variables varies across levels of a third variable, or moderator (Wu & Zumbo, 2008). In this study, sex rather than gender was used as a moderator because the variable in my dataset reflects biological classification reported on both instruments. Using 'sex' therefore more accurately describes the construct measured and avoids conflating it with gender, which refers to social roles, identity, and expression.

As shown in Figure 4, sex was first added to the regression equation predicting disposition from opportunity, providing an overall test of whether the M–Y association differed for males and females.

Figure 4

Model Testing between Opportunity for Risky play and Disposition toward Risky Play differs by Sex without an Interaction Term.

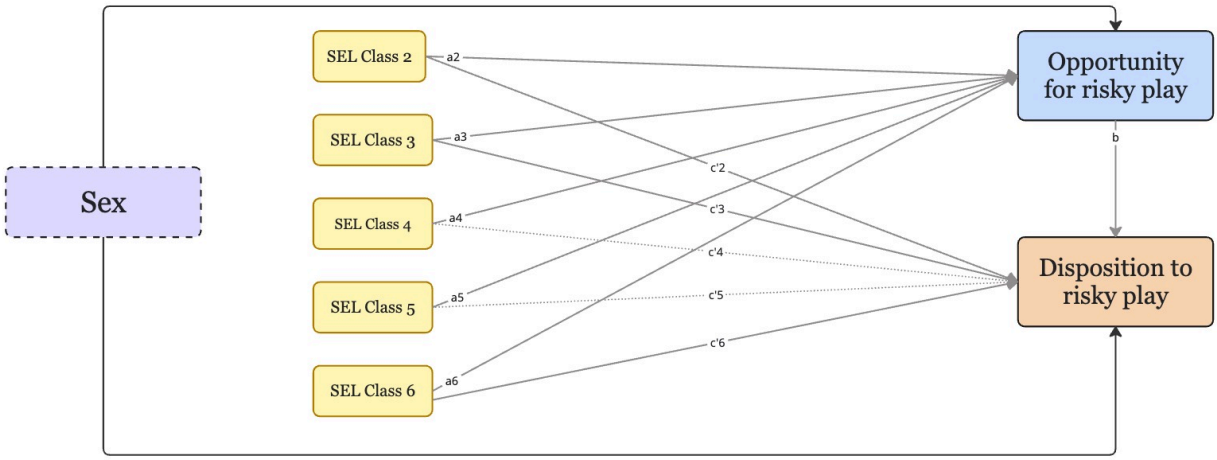
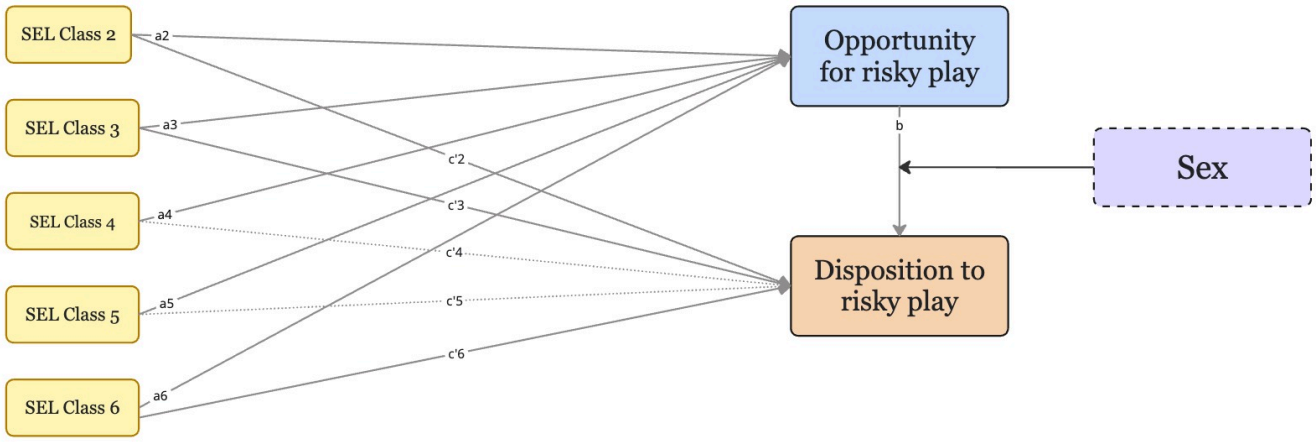


Figure 5 then represents a model including sex, opportunity for risky play, and their interaction term, which tested whether the association between opportunity and disposition varied by sex.

Figure 5

Moderated Mediation Model including the Interaction between Sex and Opportunity for Risky Play



The mediation models described above were subsequently estimated separately for males and females, yielding sex-specific total effects of SEL predictors on disposition, direct effects controlling for opportunity, and indirect effects via opportunity.

As before, indirect effects were calculated as the product of the path from the SEL predictor to opportunity (a) and the (now sex-specific) path from opportunity to disposition (b), and their significance was evaluated with the Sobel test. Comparing across males and females indicated that the size and, in some cases, the direction of the mediated effect through opportunity differed by sex, showing that variation in children's opportunities for risky play explains different proportions of SEL-related differences in disposition across both sexes.

To ensure data integrity, rigorous data-checking and assumption-checking procedures were implemented during the analysis stage. These procedures included error detection, examination of outliers, and clear definition of missing data values. For the regression analyses, careful attention was paid to meeting the assumptions of normality, homoscedasticity, linearity, and independence, as outlined by Field (2013). In addition, the disposition for risky play, measured using a five-category Likert-type item, was treated as an approximately interval-level outcome to permit the use of linear regression models, consistent with common practice in quantitative educational research. For the LCA models, multiple fit indices (for example, BIC, AIC, entropy) and substantive interpretability were used to guide the selection of the optimal number of classes. Together, these methodological decisions provided a robust framework for examining the complex relationships between SEL profiles, opportunities for risky play, and children's early social development outcomes.

Chapter Three Summary

To conclude, this chapter has outlined a comprehensive methodology for examining how distinct social-emotional learning (SEL) latent classes among kindergarten children are associated with their predisposition to engage in outdoor risky play, and how this association may be shaped by sex and children's opportunities for risky play. The study employed a retrospective cohort design using secondary, anonymized CHEQ and EDI data provided by HELP. The research questions focused on identifying and describing SEL latent classes, assessing how these classes are associated with children's predisposition to risky play, and examining opportunities for outdoor risky play mediate these associations and they differ between sexes. The chapter detailed the research design, data inclusion criteria, ethical considerations, instrumentation, and analytical methods, including latent class analysis and

regression models. By adhering to rigorous methodological standards and ensuring trustworthiness through objectivity, reliability, and validity, this study aims to contribute valuable insights to the field of early childhood development and inform evidence-based recommendations for promoting healthy child development through developmentally appropriate outdoor risky play opportunities.

Chapter Four: Findings

Chapter Four Overview

This chapter provides an integrated picture of how young children's social–emotional learning (SEL) profiles shape, and are shaped by, their engagement in risky play. It begins by describing a large, population-based kindergarten sample and documenting basic sex differences in dispositions toward and opportunities for risky play. The chapter then uses latent class analysis to identify six distinct SEL profiles that capture both strengths and vulnerabilities across social competence, prosocial behaviour, and emotional/behavioural regulation. Building on these profiles, the chapter examines how risky-play dispositions and opportunities vary across SEL classes, showing that some groups (e.g., anxious or broadly vulnerable profiles) have relatively low dispositions and/or constrained opportunities, whereas restless and disruptive profiles show high dispositions and ample opportunities. Mediation analyses clarify when opportunity helps explain SEL–risky-play links and when it acts as a suppressor, revealing children who are highly inclined toward risky play despite relatively lesser access. Finally, the chapter weaves in sex as a key context, demonstrating that males and females are distributed differently across SEL profiles, that males generally show higher dispositions toward risky play, and that the effect of opportunity on disposition is stronger for males.

Descriptive Statistics

The total analytical sample was 14,609 children (mean age = 5.40, SD = 0.31). Of the total sample, 51.8% (7563) were males and 48.2% (7046) were females. Males and females were then compared on two risky play variables: disposition for risky play and opportunity for risky play (Table 3).

Table 3.

Males and Female Split across Disposition of Risky Play and Opportunity for Risky Play

Category	Male	Female	Total
Variable: Disposition for Risky Play			
1	623 (42.2%)	854 (57.8%)	1477 (100%)
2	1652 (44.8%)	2036 (55.2%)	3688 (100%)
3	1558 (49.7%)	1579 (50.3%)	3137 (100%)
4	2090 (56.2%)	1627 (43.8%)	3717 (100%)
5	1421 (64.9%)	768 (35.1%)	2189 (100%)
Total	7344 (51.7%)	6864 (48.3%)	14208 (100%)
Variable: Opportunity for Risky Play			
1	205 (46%)	241 (54%)	446 (100%)
2	208 (47.5%)	230 (52.5%)	438 (100%)
3	543 (49.6%)	552 (50.4%)	1095 (100%)
4	530 (48.9%)	554 (51.1%)	1084 (100%)
5	2147 (49.5%)	2189 (50.5%)	4336 (100%)
6	3688 (54.7%)	3053 (45.3%)	6742 (100%)
Total	7321 (51.8%)	6819 (48.2%)	14140 (100%)

Identifying SEL Profiles with Latent Class Analysis

Model Estimation and Selection

Starting with a one-class model, successive solutions up to 10 classes were estimated to identify the best-fitting model. Relative model fit was evaluated using four standard criteria (1)

entropy values as close to 1 as possible, indicating good classification accuracy; (2) high classification probabilities for each class (most-likely class membership ≥ .80); (3) the lowest adjusted Bayesian Information Criterion (aBIC) among competing models; and (4) a statistically significant Bootstrap Likelihood Ratio Test (BLRT), indicating that a model with k classes provided a better fit than a model with k–1 classes. Parsimony, interpretability, and theoretical meaningfulness were also considered in selecting the overall best model (Sinha et al., 2021).For example, if three classes has a clear fit and moving to four or five classes only gives tiny improvements in fit, finalizing the three class model still offers a good fit since it captures the main heterogeneity in SEL without fragmenting the sample into too many groups that are hard to interpret (Nylund-Gibson & Choi, 2018).

In total, ten models were tested (Table 4). Random starting values were increased to 500 with 40 final-stage iterations to reduce the risk of local maxima and biased parameter estimates (Nylund, Asparouhov, & Muthén, 2007). For models with up to ten classes, the number of random starts and final-stage iterations was further increased to 2,000 and 100 to ensure stable solutions. The log likelihood improves (becomes less negative) and aBIC decreases steadily from 1 through 10 classes, indicating better statistical fit with more classes; however, each additional class gives progressively smaller improvements in aBIC especially after class 6. Entropy is highest for the 2-class model (0.889) and then generally declines as classes are added (down to 0.752 at 10 classes), suggesting that classification becomes less clear with more classes. The VLMRT is significant from classes two to ten suggesting that all models could be a good fit in comparison to the previous one. Average most-likely class membership probabilities are generally high (≥ .76) across all solutions, but start to dip below the 0.80 guideline with five or more classes (e.g., 0.792 at 5 classes, 0.782 at 7 classes, 0.769 at 8 classes), meaning some

classes are less distinctly defined. As the number of classes increases, the smallest class becomes very small (e.g., 466 children, 3.2% of the sample in the 10-class model), suggesting that higher-class solutions create tiny groups that may be unstable and harder to interpret or use in practice. Models with seven to ten classes were also estimated but were not retained. Although these higher-order models produced small additional decreases in adjusted BIC relative to the six-class solution, overall improvements in fit were minimal and entropy did not improve meaningfully. At the same time, the smallest class proportions dropped to approximately 3–4%, yielding very small classes that were more difficult to interpret substantively and less stable for subsequent analyses. Consistent with guidance to avoid over-extracting classes when extra classes yield only trivial fit gains and poorly defined or very small classes, these higher-order models were rejected in favour of the more parsimonious six-class solution (Sinha et al., 2021).

Based on the fit statistics, the four- and six-class solutions were retained as the potential models. The 5-class solution was not retained because its smallest class showed a relatively low most-likely class membership probability (0.792) and the smallest class proportion dropped to 5.7%, indicating a very small group that may be unstable and difficult to interpret meaningfully. Both four- and six-class solutions models showed relatively low adjusted BIC values, acceptable entropy, and smallest class proportions above 7% indicating adequate class separation and sufficient class size for interpretation. It is also pertinent to note that although the VLMRT was examined, it was not particularly informative for class selection because the p-values were significant across all solutions, therefore offering very little guidance for identifying an optimal number of classes. Before identifying and interpreting the classes, it is crucial to gauge conceptual meaningfulness and plausibility of each class solution (Muthén, 2003). An approach to do this is to visually inspect the item probability plot (Nylund-Gibson & Choi, 2018).

Table 4.

Latent Class Analysis Model Fit Comparison

No. of latent classes	Log Likelihood value	aBIC	Entropy	VLMRT	Lowest class probability	Smallest class size	Smallest class proportion
1	-97053.927	194210.438	NA	NA	1.000	14609	1.0000
2	-81232.176	162675.931	0.889	0.000	0.957	4914	0.33637
3	-77972.447	156265.467	0.844	0.0000	0.943	2110	0.14443
4	-76944.600	154318.769	0.804	0.0000	0.939	2089	0.14299
5	-76388.936	153316.436	0.770	0.0000	0.792	838	0.05736
6	-75952.732	152553.022	0.771	0.0000	0.934	1087	0.07441
7	-75745.191	152246.937	0.781	0.0000	0.782	593	0.04059
8	-75563.701	151992.951	0.789	0.0042	0.769	947	0.06482
9	-75404.720	151783.985	0.771	0.0001	0.776	498	0.03409
10	-75291.353	151666.246	0.752	0.0001	0.765	466	0.03190

Note. Abbreviations: adjusted BIC (aBIC), Vuong–Lo–Mendell–Rubin likelihood ratio test (VLMRT)

Visual inspection of the four and six class-profile plots indicated that the four-class solution captured broad gradients in SEL functioning, but individual classes showed a 'salsa-like' aggregation of patterns, consistent with Sinha's description of the salsa effect, in which a single underlying dimension is partitioned into low, medium, and high levels (Sinha et al., 2021). In contrast, the six-class solution (Figure 2) still retains some of the salsa effect similar to the four class solution but provided finer interpretable distinctions between groups, allowing a greater variety of patterns to emerge while still yielding theoretically meaningful and interpretable profiles, suggesting that a six-class model specification better captured the

multidimensional heterogeneity of children's SEL functioning Given this, the six-solution was chosen.

Figure 6.

Six-Class SEL Latent Class Profiles

To evaluate how well children were classified into the six SEL latent classes, indices of classification quality were examined. Specifically, the average posterior probabilities of most-likely class membership for each class. Average posterior probabilities between 0.72 to 0.93 indicating that children were assigned to their respective classes with high certainty, supporting the reliability and interpretability of the identified SEL profiles (Table 5).

Table 5.

Posterior Probabilities of SEL Six Class Solution

	1	**2**	**3**	**4**	**5**	**6**
1	**0.89**	0.07	0.00	0.03	0.00	0.00
2	0.10	**0.77**	0.03	0.10	0.01	0.00
3	0.00	0.03	**0.76**	0.06	0.08	0.06
4	0.05	0.11	0.04	**0.72**	0.07	0.00
5	0.00	0.01	0.04	0.07	**0.82**	0.06
6	0.00	0.00	0.02	0.00	0.05	**0.93**

The relative size of each class was also considered; class proportions ranged from 7% to 43%, indicating that all classes contained a sufficient share of the sample to support stable estimation and meaningful substantive interpretation (Table 6).

Table 6.

Class Proportion of Children of SEL Six Class Solution

Latent class	**Count**	**Proportion**
1	6232	43%
2	2128	15%
3	1087	7%
4	2233	15%
5	1506	10%
6	1423	10%

Description of SEL Latent Classes

The six-class latent class solution produced conceptually coherent profiles of children's social-emotional learning (SEL) across the eight EDI Social Competence and Emotional Maturity subscales. After examining the item-response patterns within each class, the characteristics of different SEL groups were examined. This subsection names and describes each latent class, focusing on their strengths and vulnerabilities across the EDI indicators of school readiness.

Class 1: Overall high SEL. Children in this profile showed consistently high levels of school readiness, with high scores on Overall Social Competence, Respect & Responsibility, Approaches to Learning, Readiness to Explore New Things, and Prosocial & Helping Behavior. Scores on the Emotional Maturity subscales (Anxious & Fearful, Aggressive, and Hyperactive & Inattentive) were reverse-coded, such that low raw levels of these behaviors correspond to high readiness; accordingly, children in this class demonstrated high readiness across all domains. This pattern reflects children who are socially skilled, engaged in learning, and behaviorally well-regulated.

Class 2: Compliant-Reserved. Class 2 was characterized by relatively strong Respect & Responsibility and low levels of Aggressive and Hyperactive & Inattentive behaviors (indicating higher readiness on these Emotional Maturity subscales), but lower scores on Overall Social Competence and only moderate Approaches to Learning, Readiness to Explore, and Prosocial & Helping. These children tend to follow rules and show appropriate behavior but appear more reserved and less exploratory in classroom interactions.

Class 3: Moderately Compliant – Anxious. Children in Class 3 displayed low levels of Overall Social Competence and prosocial behaviors but moderate classroom compliance, with

relatively low Aggressive and Hyperactive & Inattentive behaviors (indicating higher readiness on these subscales) and elevated Anxious & Fearful Behavior. This profile captures children who generally participate and follow expectations yet experience internalizing difficulties that may limit their confidence and engagement.

Class 4: Moderately compliant – Restless. Class 4 showed moderate Overall Social Competence but struggles to listen attentively or follow directions along with higher Hyperactive & Inattentive scores, while readiness to explore remained reasonably strong. These children typically attempt to comply with classroom norms but present with restlessness and regulation challenges.

Class 5: Non-compliant and Disruptive. Children in Class 5 showed lower Responsibility and Respect and Approaches to Learning, accompanied by higher Aggressive Behavior (physical and non-physical aggression, disobedience) and Hyperactivity and Inattention. This profile represents children whose externalizing behaviors and weaker work habits interfere with peer relationships and classroom functioning. However, their readiness to explore is strong.

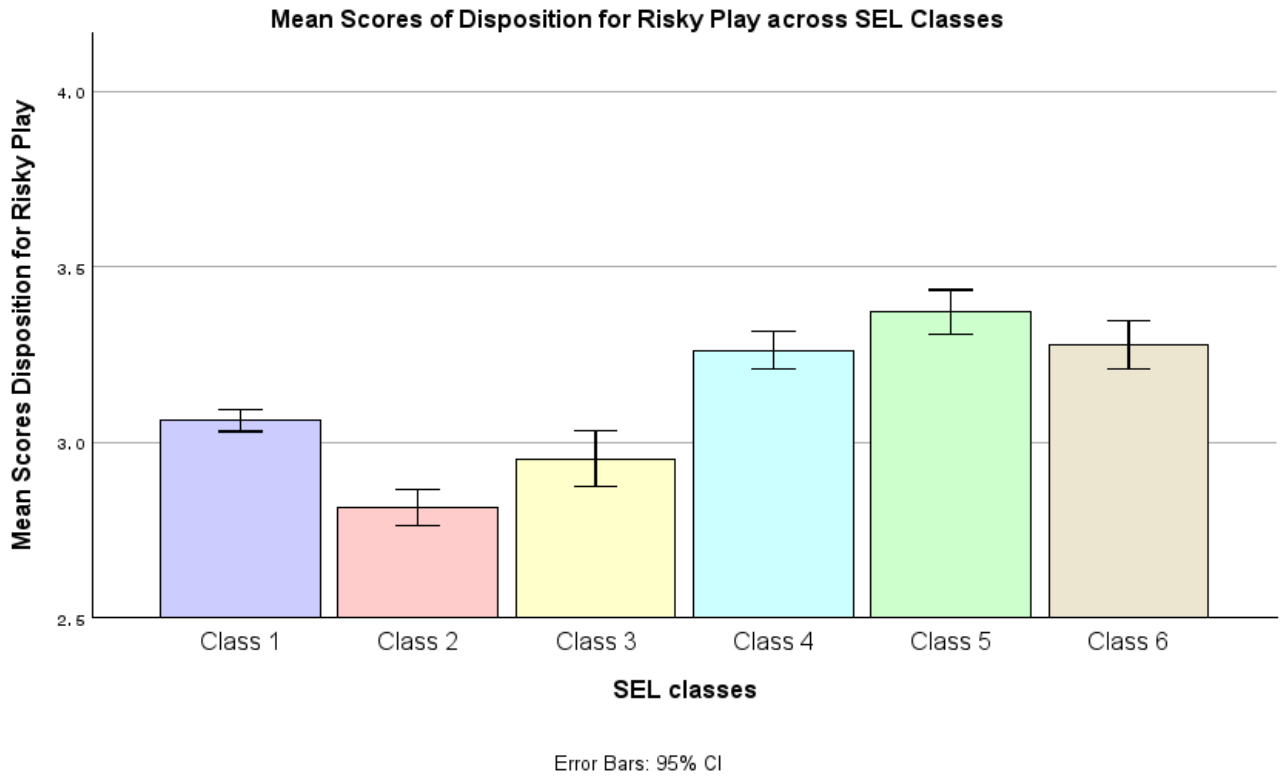
Class 6: Overall low SEL. Class 6 showed low scores on Overall Social Competence, Responsibility and Respect, and Approaches to Learning, and elevated Aggressive and Hyperactive and Inattentive behaviors with moderate scores on Readiness to Explore New Things and Anxious and Fearful Behavior. This profile reflects broad social-emotional vulnerability, marked by difficulties in social relationships, work habits, and behavior regulation, alongside moderate curiosity and internalizing concerns.

Relationship between SEL Classes and Risky Play

Mean scores of dispositions toward risky play differed across the six SEL classes (Figure 3). Pairwise differences between disposition of SEL classes and the reference group were estimated using linear regression with dummy-coded class indicators. Missing data were handled by SPSS using listwise deletion, such that cases with missing values on variables included in the model were omitted from the analysis. Children in Class 1 (Overall high SEL) showed a moderate disposition to risky play at the midpoint of the scale (M = 3.06, SD = 1.203). Relative to this reference group, Class 2 (Compliant-Reserved) had a significantly lower mean disposition (M = 2.81, SD = 1.211, B = -.247, SE =.031, t = -7.88 , p <.001), whereas Classes 4 (Moderately Compliant – Restless; M = 3.26, SD = 1.251, B = .20, SE = .031, t = 6.53 , p <.001), 5 (Non-compliant and Disruptive; M = 3.37, SD = 1.23, B =.31, SE= .036, t = 8.66 , p <.001), and 6 (Overall low SEL; M = 3.28, SD = 1.28, B = .22, SE = .04, t = 5.905 , p <.001) all showed significantly higher mean dispositions toward risky play. Class 3 (Moderately Compliant – Anxious; M = 2.95, SD = 1.31, B = -.11, SE = .041, t = -2.648, p <.008) fell slightly below Class 1 and above Class 2 and did not differ as distinctly from the reference group as the higher-scoring classes.

Figure 7.

Mean Scores of Disposition of Risky Play across SEL Classes



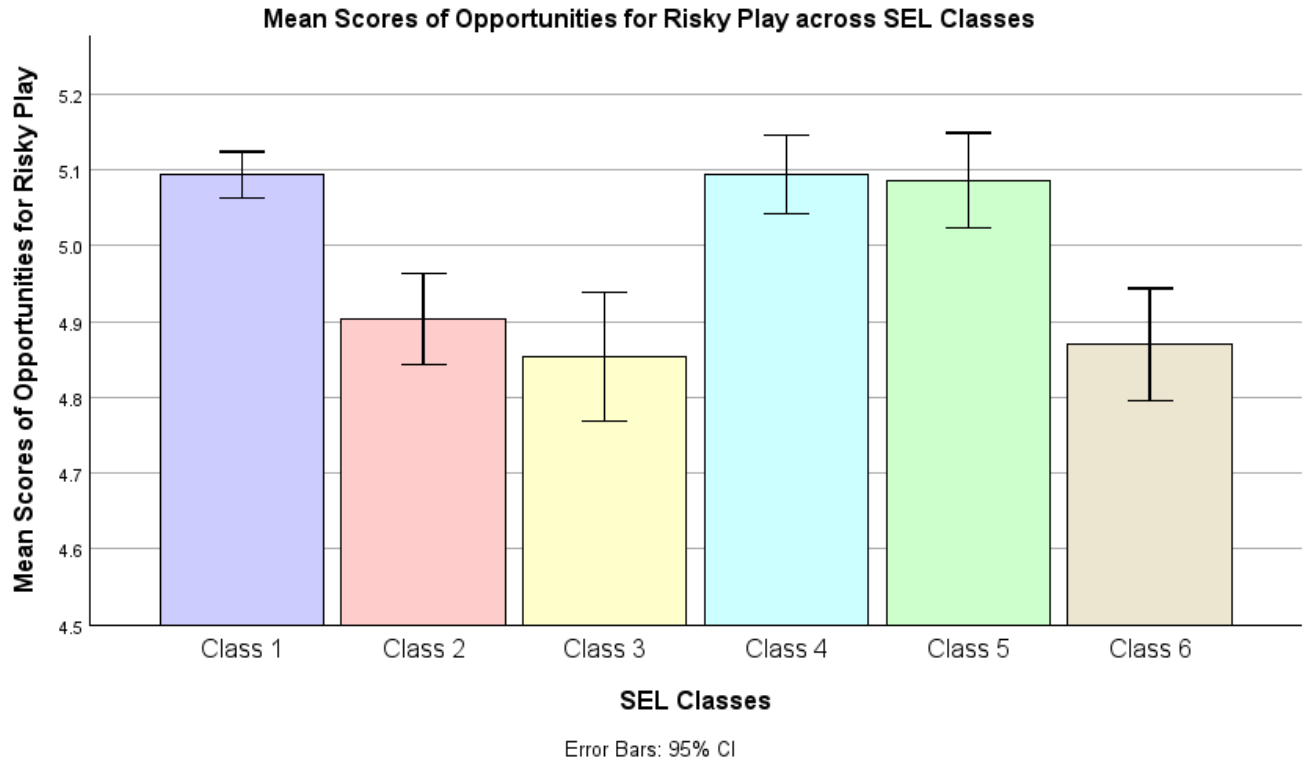
Note. $p < .05$
Class 2, 3 < Class 1; Class 4, 5, 6 > Class 1.

Opportunities for risky play also differed across the six SEL classes (Figure 4). Pairwise differences between disposition of SEL classes and the reference group were estimated using linear regression with dummy-coded class indicators. Examining mean levels of opportunity by class is essential, because these differences will be used to assess whether opportunity for risky play mediates the primary association of interest. Children in Class 1(Overall high SEL) had the highest mean opportunities for risky play (M = 5.09, SD = 1.219), indicating more frequent access to challenging play experiences. Children in Class 4 (Moderately compliant – Restless; M 5.09=, SD = 1.229, B =.001, SE =.032 , t = .031 , p = .975) and children in Class 5

(Non-compliant and Disruptive; *M* =, *SD* = , *B* = -.007, *SE* = .037 , *t* = -.195 , *p* = *.845*) showed identical patterns of opportunity for risky play where they had relatively high opportunities for risky play similar to Class 1(*M* = 5.09, *SD* = 1.229). In contrast, children in Class 2 (Compliant-Reserved; *M* = 4.90, *SD* = 1.385, *B* = -.191, *SE* = .033 , *t* = -5.82 , *p*<.001), Class 3 (Moderately compliant – Anxious; *M* = 4.85, *SD* = 1.398, *B* = -.240, *SE* = .043 , *t* = -5.6 , *p* <.001) and Class 6 (Overall low SEL; *M* = 4.87, *SD* = 1.406, *B* = -.224, *SE* = .038 , *t* = -5.860 , *p* <.001) had lower opportunities for risky play.

Figure 8.

Mean Scores of Opportunities for Risky Play Across SEL Classes



Note. *p* < .05.
Class 2, 3, 6 < Class 1; Class 4, 5 = Class 1 (ns).

Taken together, the two sets of means show clear class-based differences in both disposition toward risky play and opportunity for risky play when compared to Class 1 (Overall

high SEL). Relative to this reference group, Classes 2 and 3 have lower mean dispositions and lower mean opportunities, whereas Classes 4 and 5 have higher mean dispositions and higher mean opportunities. This pattern suggests a general alignment, at the mean level, between children's inclination to engage in risky play and the opportunities available to them across most SEL profiles.

Class 6 (Overall low SEL) differs from this pattern. Compared with Class 1, children in Class 6 have similarly elevated mean dispositions toward risky play but notably lower mean opportunities, more comparable to those of Classes 2 and 3. A fuller interpretation of these differences is deferred to the mediation analyses, where we examine whether opportunity for risky play statistically accounts for (or modifies) the associations between SEL class membership and disposition toward risky play.

Testing Mediation Models of Opportunity for Risky Play across SEL Classes

Table 7 presents the relationship between class membership and disposition to risky play with SEL Class 1 as the reference group

Table 7.

Relationship between Class Membership and Disposition of Risky Play

SEL Classes	Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t
Constant	3.062	.016		193.874
SEL class 2 vs 1 (ref)	-.247	.031	-.070***	-7.881
SEL class 3 vs 1 (ref)	-.109	.041	-.023**	-2.648
SEL class 4 vs 1 (ref)	.201	.031	.058***	6.532
SEL class 5 vs 1 (ref)	.310	.036	.076***	8.666
SEL class 6 vs 1 (ref)	.217	.037	.052***	5.905

Note. $p<0.05$*, $p<0.01$**, $p<0.001$***, $R^2 = .01$

Total-effects models (Model 1) indicated that children in Class 2 and Class 3 had significantly lower dispositions toward risky play than Class 1 ($B = -0.070$ and -0.023, respectively, $p < .001$ and $p < .01$), whereas children in Classes 4, 5, and 6 showed significantly higher dispositions ($B = 0.058$, 0.076, and 0.052, all $p < .01$). These regression results confirm the pattern observed in the earlier pairwise comparisons of mean risky-play dispositions, with Classes 2 and 3 scoring below the reference group and Classes 4, 5, and 6 scoring above it.

SEL class was significantly associated with opportunity for risky play (path a) for Classes 2, 3, and 6 ($B = -0.049$ to -0.052, $p < .001$), indicating children in these classes had fewer opportunities than children in Class 1. Opportunity for risky play, in turn, was positively related to disposition toward risky play (path b) across the sample ($B = 0.441$, $p < .001$), such that more opportunity was associated with higher disposition.

Table 8 presents the total, direct, and indirect effects of SEL class membership on children's disposition toward risky play, with SEL Class 1 as the reference group mediated by opportunities of risky play.

Table 8.

Direct and Indirect effects of SEL Profiles on Disposition of Risky Play Mediated by Opportunity for Risky Play

SEL Classes	Total effect (c)	Indirect effect (a x b)	Direct effect (c')	Sobel Test	Role of mediator
SEL class 2 vs 1 (ref)	-.070***	-0.023	-0.047	5.705***	32.76
SEL class 3 vs 1 (ref)	-.023**	-0.022	-0.001	-5.641 ***	93.95
SEL class 4 vs 1 (ref)	.058***	0.000	0.058	0.040	0
SEL class 5 vs 1 (ref)	.076***	-0.001	0.077	-0.207	-1.16

SEL class 6 vs 1 (ref)	.052***	-0.023	0.075	-5.806***	-44.1

Note. $p < .05$*, $p < .01$**, $p < .001$***

For Class 2, the indirect effect through opportunity was $B = -0.023$, and the direct effect was reduced from −0.070 to −0.047. The Sobel test was significant ($z = -5.705$, $p < .001$). Approximately 33% of the total effect of Class 2 (vs. Class 1) on disposition toward risky play was mediated by opportunity for risky play. Thus, in Class 2, approximately one-third of the observed difference in disposition relative to Class 1 is statistically accounted for by lower reported opportunities for risky play, with the remaining two-thirds associated with differences in children's disposition that are not explained by opportunity in these models.

For Class 3, the indirect effect was $B = -0.022$ and the direct effect was essentially zero ($B = -0.001$), with a significant Sobel test ($z = -5.641$, $p < .001$). The estimated mediated proportion was approximately 94%, indicating that nearly the entire association between Class 3 membership and disposition toward risky play operated through opportunity for risky play.

In contrast, for Classes 4 and 5, path-a coefficients were near zero and the indirect effects were negligible ($B = 0.000$ and −0.001, respectively), with non-significant Sobel tests ($z \approx 0$ and −0.207). The mediated proportions were effectively zero, indicating that opportunity for risky play did not statistically explain the higher dispositions toward risky play observed for these groups; instead, their elevated dispositions appear more closely associated with characteristics of their SEL profiles themselves within these models.

For Class 6, SEL class was again negatively associated with opportunity (path-a $B = 0.052$, $p < .001$), and the indirect effect was $B = -0.023$ with a significant Sobel test ($z = -5.806$, $p < .001$). However, the mediated proportion was negative (−44.1%), consistent with a suppression pattern, whereby including opportunity increased the magnitude of the positive

association between Class 6 membership and disposition toward risky play (direct effect B = 0.075 vs. total effect B = 0.052). In this inconsistent mediation pattern, children in Class 6 show a strong inclination toward risky play despite having relatively fewer opportunities for such play, so opportunity appears to constrain rather than explain their elevated dispositions within these model.

Role of Sex on Disposition of Risky Play

Sex Distribution and Overall Mediation Model

Because previous research shows that males and females differently in risky play, sex was included in the analyses to examine gender-related variation in risky play dispositions through differences in SEL class membership, main effects of gender, its interaction with opportunity for risky play, and the direct and indirect effects estimated separately for males and females.

When cross-tabulations of SEL classes by gender were examined (Table 9), the distribution of males and females across the SEL classes differed, indicating sex-related variation in SEL class membership.

Table 9.

Sex Distribution Across Social–Emotional Learning (SEL) Profiles

Class	Count	Gender		Total
		Males	**Females**	
1	Count	2587	3645	**6232**
	% within Sex	34.2%	51.7%	**42.7%**
2	Count	909	1219	**2128**
	% within Sex	12.0%	17.3%	**14.6%**
3	Count	692	395	**1087**
	% within Sex	9.1%	5.6%	**7.4%**
4	Count	1294	939	**2233**
	% within Sex	17.1%	13.3%	**15.3%**
5	Count	993	513	**1506**
	% within Sex	13.1%	7.3%	**10.3%**
6	Count	1088	335	**1423**
	% within Sex	14.4%	4.8%	**9.7%**
Total	**Count**	**7563**	**7046**	**14609**
	% within Sex	100.0%	100.0%	100.0%

The distribution of SEL classes varied by sex. A greater proportion of females were classified in Class 1 (Overall High SEL) and Class 2 (Compliant and Reserved), whereas males were more frequently represented in Classes 3–6, which reflect profiles characterized by challenges across emotional subscales.

In a main-effects model including sex and opportunity for risky play, (Table 10), females showed a significantly lower disposition toward risky play than male ($B = -0.26$, $\beta = -.105$, $p < .001$), indicating that, on average, males reported higher levels of risky play engagement than females, controlling for both class membership and opportunity for risky play.

Table 10.

Effect of SEL Class on Disposition Toward Risky Play, Mediated by Opportunity for Risky Play and Controlling for Sex

Model	B	Standard error	Standardized Coefficients Beta (β)
(Constant)	3.189	.018	
Sex	-.262	.019	-.105***
Zscore: Opportunity for risky play	.539	.009	.434***
Class two	-.166	.028	-.047***
Class three	-.066	.037	-.014
Class four	.164	.028	.048***
Class five	.249	.032	.061***
Class six	.213	.033	.051***

Note. $P < .05$*, $p < .01$**, $p < .001$***

Sex Moderation of the Opportunity–Disposition Path

To formally test whether sex moderated the association between opportunity for risky play and disposition toward risky play, an interaction term between sex and opportunity was

added to the model (Table 11). In this interaction model (Table 9), the Sex × Opportunity term was significant ($B = -0.12$, $\beta = -.07$, $p < .001$), indicating that the positive association between opportunity for risky play and disposition toward risky play was weaker for females than for males. In other words, increases in opportunity were associated with larger gains in risky play disposition for males than for females, although the main effect of opportunity remained positive and significant for both genders ($B = 0.60$, $\beta = .483$, $p < .001$). Because the interaction between opportunity and sex was significant, the effects of opportunity for risky play were next estimated separately for males and females to clarify how this association differed by sex.

Table 11.

SEL Class, Sex, Opportunity for Risky Play, and Sex × Opportunity Interaction Relating to Disposition Toward Risky Play

Model	B	Standard error	Standardized Coefficients Beta (β)
(Constant)	3.186	.018	
Sex x Opportunity for risky play	-.122	.018	-.070***
Class two	-.167	.028	-.047***
Class three	-.064	.037	-.014
Class four	.161	.028	.047***
Class five	.247	.032	.061***
Class six	.214	.033	.051***
Sex	-.262	.019	-.105***
Opportunity for risky play	.600	.013	.483***

Note. $p < .05$*, $p < .01$**, $p < .001$***

Sex-Specific Mediation Effects

Because the earlier interaction analysis indicated that sex moderates the association between opportunity for risky play and disposition toward risky play, we next estimated parallel mediation models separately for males and females to examine whether the mediation patterns observed overall were similar or different by child sex (Table 12).

Table 12.

Sex-Specific Effects of Opportunity: Males and Females

SEL Classes	**Total effect** (c)	**Indirect effect (a x b)**	**Direct effect** (c')	**Sobel Test**	**Role of mediator**
			Males		
SEL class 2 vs 1 (ref)	-0.066***	-0.026	-0.040	-4.244***	38.78
SEL class 3 vs 1 (ref)	-0.049***	-0.028	-0.021	-4.829***	58.04
SEL class 4 vs 1 (ref)	0.051***	0.002	0.049	.265	3.72
SEL class 5 vs 1 (ref)	0.063***	-0.004	0.067	-0.675	-6.77
SEL class 6 vs 1 (ref)	0.024***	-0.030	0.054	-4.834***	-124.43
			Females		
SEL class 2 vs 1 (ref)	-0.077***	-0.021	-0.056***	-4.233***	27.28
SEL class 3 vs 1 (ref)	-0.025*	-0.020	-0.005	-4.814***	79.18
SEL class 4 vs 1 (ref)	0.034**	-0.006	0.040***	-1.288	-19.01
SEL class 5 vs 1 (ref)	0.048***	-0.004	0.052***	-0.836	-8.42
SEL class 6 vs 1 (ref)	0.028*	-0.027	0.055***	-5.413 ***	-96.67

Note. $p < .05$*, $p < .01$**, $p < .001$***

The overall pattern of mediation by opportunity for risky play was similar for both sexes, SEL Classes 2, 3, and 6 showed negative and statistically significant indirect effects, indicating

that lower opportunity partly accounted for their lower disposition toward risky play relative to Class 1. However, the magnitude of the mediated proportions differed by sexe. For Classes 4 and 5, mediated proportions were small and close to zero for both sexes, indicating that high disposition toward risky play in these groups reflects SEL-related behavioural tendencies rather than differences in opportunity for risky play.

For Class 3, opportunity for risky play played a larger mediating role for females than for males. Among males, reduced opportunity accounted for about one-half of the association between Class 3 membership and lower disposition toward risky play (mediated proportion ≈ 58%). In contrast, for females, approximately four-fifths of the effect was mediated (≈ 79%), indicating that their lower disposition toward risky play was driven primarily by having fewer opportunities rather than by inherent differences in inclination. This suggests that for the Moderately Compliant–Anxious profile, females' engagement in risky play is especially sensitive to the opportunities available to them.

For Class 6, both males and females showed suppression effects, but the pattern was stronger for males. In this Overall low SEL profile, the mediated proportion was −124% for males compared with −96.67% for females, meaning that controlling for opportunity substantially increased the positive association between class membership and disposition toward risky play in both sexes, with a larger strengthening among males. Thus, for Class 6 children how are in Overall low SEL class, especially males, have relatively high disposition toward risky play that appears to reflect broad social-emotional and behavioural traits, and becomes even more evident once differences in opportunity are taken into account.

Chapter Four Summary

This chapter examined how kindergarten children's social–emotional learning (SEL) profiles relate to their dispositions toward and opportunities for risky play, and how these patterns differ by sex. Using latent class analysis on EDI data from 14,609 children, six conceptually coherent SEL profiles were identified, ranging from Overall high SEL to Overall low SEL, with adequate classification quality and class sizes. Profiles characterized by anxiety or broad SEL difficulties generally showed lower dispositions and/or fewer opportunities for risky play, whereas restless and disruptive profiles showed higher dispositions and relatively high opportunities. Mediation analyses indicated that opportunity for risky play partially explained lower dispositions in some profiles (especially Moderately Compliant–Anxious), while a suppression pattern in the Overall low SEL group suggested strong risky-play inclination despite constrained opportunity. Males were overrepresented in profiles with greater emotional and behavioural challenges and, controlling for SEL and opportunity, showed higher risky-play dispositions than females; the link between opportunity and disposition was also stronger for males. Overall, the chapter highlights how heterogeneous SEL patterns and sex jointly structure both children's desire to engage in risky play and the opportunities they receive.

Chapter Five: Discussion

Chapter Five Overview

In this study six distinct SEL classes at kindergarten entry were identified, with Class 1 (Overall High SEL) serving as the reference group and the remaining classes labelled to reflect their specific constellations of strengths and difficulties across SEL subscales: Class 2 (Compliant - Reserved) , Class 3 (Moderately Compliant -Anxious), Class 4 (Moderately Compliant – Restless) , Class 5 (Non-compliant – Disruptive), Class 6 (Overall Low SEL). Across these classes, opportunity for risky play functioned as a mediator for Class 2, 3 and 6, explaining a substantial portion of the association between SEL profile and children's disposition toward risky play for some groups. The mediating role of opportunity was moderated by sex, with females in Class 2, 3 and 6 showing stronger links between the opportunities adults provide and their own willingness to engage in adventurous play, whereas males were more heavily represented in the more behaviourally vulnerable SEL classes. The purpose of this chapter is to summarize and discuss the results of this study in the context of the literature. Next, I examine the significance and implications for parents, early childhood educators and kindergarten teachers along with the strengths and limitations of this study. Based on the study results, future research directions are explored. The chapter ends with a conclusion of the present study.

Discussion of the Results in the Context of the Literature

SEL classes as per Latent Class Analysis

Children's social-emotional skills and dispositions can be seen as part of their personal "risk profile." Self-regulation, emotion regulation and social competence traits influence how children see risk, handle fear, and choose whether to join in challenging play (Caspi & Silva, 1995; Sandseter, 2009; Cook et al., 1999; Caspi et al., 1998). Drawing on Sandseter's distinction

between objective and subjective risk, these characteristics can be understood as aspects of children's subjective risk, shaping how risky a given situation feels to them (Sandseter, 2009). Children with stronger regulation and confidence are more likely to experience risky play as exciting but manageable, while those who are more anxious, inhibited, or dysregulated may see the same situations as overwhelming and choose to withdraw. From this view, different patterns of SEL strengths and difficulties are likely to be linked to different levels of readiness to explore and to take part in risky play.

Drawing on a large, population-based sample of kindergarten children, the latent class analysis yielded six qualitatively distinct patterns of social-emotional functioning, each reflecting a different configuration of strengths and difficulties. In this study, the six SEL classes can be interpreted as distinct subjective risk profiles, each reflecting a different combination of social-emotional strengths and difficulties that may support or constrain children's readiness to explore and engage in risky play. In the linked CHEQ–EDI cohort, approximately 42% of children were assigned to the overall high SEL profile, compared with about 55% in a previous population-based study of BC kindergarten children using EDI data and latent profile analysis (Ning et al., 2023; Thomson et al., 2021; Wiggins et al., 2015). 58% of children belonged to profiles that showed at least some areas of vulnerability highlighting that a substantial minority enter school without being ready on these scales.

In this study, the pattern of classes broadly aligns with the profiles described by Thomson et al., with some important differences. Class 1 (Overall High SEL) corresponds to Thomson's "overall high social–emotional functioning" group, with strong skills and regulation across domains. Classes 2 (Compliant-Reserved) and 3 (Moderately Compliant–Anxious) parallel Thomson's inhibited-adaptive and uninhibited-adaptive profiles, but Class 2 is more cautious and

less socially confident, whereas Class 3 is more anxious with weaker prosocial skills. Classes 4–6 resemble Thomson's vulnerable profiles. However, it further separates a "restless" pattern from more clearly "disruptive" and globally low SEL patterns, with high exploration combining with hyperactivity and aggression in more distinct ways. Although in this study the high-SEL proportion is lower than previous studies, this difference is consistent with the distinct sampling frames and analytic decisions across studies. The earlier work included most of the census provincial cohort and included almost all children with valid EDI scores, whereas the sample for this study was restricted to children with successfully linked CHEQ–EDI records. This represents a selective subset of families and schools. Only 49 of B.C.'s 60 school districts currently participate in the CHEQ, and participation is voluntary at the parent/caregiver level. As a result, the CHEQ data do not capture all children in the province and should not be interpreted as representing the entire population (Human Early Learning Partnership, 2026). In addition, there are differences in the years of data collection, indicator scaling, and model specification (for example, the exact SEL subscales included and the way scores were standardized). This may shift the relative size of the latent profiles, even if the overall pattern of profiles is conceptually similar.

Although Classes 2 and 3 both show relatively low readiness to explore and similar scores on the anxious–fearful dimension, Class 3 (Moderately Compliant–Anxious) scores the lowest on readiness to explore. This pattern is consistent with longitudinal work on behaviorally inhibited (BI) children. BI is associated with withdrawal from novel or challenging situations and reduced approach toward unfamiliar peers and activities, even when overt anxiety is not very high (Buss et al., 2016; Fox et al., 2023; Henderson et al., 2014). In contrast, Class 2 (Compliant–Reserved) like BI but is somewhat less constrained in exploration than Class 3. This

aligns with evidence that BI can follow different pathways, with some children showing stronger everyday behavioral withdrawal than others who have similar levels of anxious–fearful affect (Fox et al., 2023; Henderson et al., 2014). Class 4 (Moderately Compliant–Restless) shows higher readiness to explore than both Classes 2 and 3. This pattern is consistent with findings that children who are less behaviorally inhibited are more willing to approach novelty and engage in exploratory behavior.

Classes 5 (Non-Compliant and Disruptive) and 6 (Overall low SEL) are characterized by similar patterns of lower rule following and social competence, although Class 6 scores lower on most subscales. Something noteworthy is that Class 5 (Non-Compliant and Disruptive) has a high readiness to explore, with exploration levels comparable to those of children in Class 1 (Overall High SEL). This pattern is consistent within what is described within temperament literature. Researchers describe children whose strong approach or reward-seeking tendencies are not matched by equally strong effortful control. They readily pursue appealing, novel experiences but struggle more to comply with rules and inhibit their impulses (Jonas & Kochanska, 2018). Effortful control is known to have an influence on educational attainment and academic success in later years (Véronneau et al., 2014).

This study identified six distinct social-emotional classes at kindergarten entry and found clear differences in children's disposition toward risky play across these profiles. Mean scores for disposition and opportunity for risky play were inspected and showed statistically significant class-based differences. Taken together, these differences in opportunity suggest that opportunity to risky play may be an important pathway linking SEL profiles to children's dispositions toward such play. On this basis, subsequent modeling tested whether opportunity statistically mediated the associations between SEL class membership and risky-play disposition.

Mediation of Opportunity on Risky Play Disposition

Class 1 (Overall high SEL) showed a moderate disposition toward risky play, with several other profiles scoring either above or below this group. This suggests that broad social-emotional competence does not automatically translate into especially high or low risky-play disposition. In contrast, much of the existing literature has framed risky or adventurous play as a potential driver of social competence and prosocial behaviour, with studies showing that children who engage more frequently in risky play tend to display higher prosocial behaviours and social skills over time **(**Bahrenscheer & Sederberg, 2019; Sandseter, 2015; Sandseter et al., 2022; Brussoni et al., 2017**).** This group was used as the reference class for further analyses.

Children in Class 2: Compliant - Reserved show lower disposition to risky play in comparison to the reference Class 1: Overall high SEL. Approximately 33% of the total effect of Class 2 (vs. Class 1) on disposition toward risky play was mediated by opportunity for risky play. This pattern of risk taking is explains how objective and subjective risks can explain a child's risk-taking behavior (Sandseter, 2009). In the case of children in this class, the child's personal characteristic, past experiences with risky play, individual risk assessment abilities and personality trait have an influence on their own disposition to risk (Sandeter, 2009).

For Class 3- Moderately Compliant- Anxious, the estimated mediated proportion was approximately 94%, indicating that nearly the entire association between Class 3 membership and disposition toward risky play operated through opportunity for risky play. This pattern is consistent with conceptual model of adventurous play and anxiety by Dodd and Lester (2021) where they argue that anxious children tend to avoid fearful situations and because of this avoidance, it blocks their experiences to take risks, and their anxiety is most likely to persist.

This explains their disposition to risky play and most of their predisposition to play is associated with opportunities provided for risky play. It is worth noting that Class 2 and Class 3 are among the lowest readiness for school in the readiness to explore subscale.

The mediation effect for Classes 4 and 5 was minimal and not significant, suggesting that, for these more active profiles, opportunity does not meaningfully explain their higher disposition toward risky play. Children in Class 6 show higher disposition to risky play in comparison to the reference group Class 1: Overall High SEL. The mediation account for 44% of their disposition to risky play but in the opposite direction. This points to a more complex picture. In early childhood, risky play typically occurs in the presence of adults. Adults are typically considered to be responsible for providing safe spaces as well as support children in their abilities while participating in risk (Canadian Paediatric Society, 2024; Rooijen et al., 2023). Although no studies have directly examined children with profiles identical to our Class 6, research on overprotective parenting and parental responses to children's risk-taking suggests that adults tend to be more controlling and restrictive when children show behavior or emotional difficulties and are perceived as less competent in play (Armstrong, 2025; Sandseter, 2009). Considering this, one possible interpretation is that these children have a strong internal inclination toward risky play, but the opportunities they receive—highly supervised, cautious, or anxiety-evoking—may work against that interest, so opportunity statistically suppresses rather than explains their elevated disposition. Another way to interpret this pattern is by examining the visual plot of children's school readiness across the six subscales. Children in Class 5 and Class 6 show broadly similar profiles, but children in Class 6 differ on the readiness to explore subscales and on the anxious and fearful subscales. Class 6 children have lower readiness on the readiness to explore and anxious and fearful subscales in comparison to Class 5. These

differences suggest that children in Class 5 tend to have lower readiness to explore and opportunities for risky play may evoke more fear and uncertainty for these children based on their context – both subjective and objective (Dodd & Lester, 2021; Sandseter, 2009). Taken together, these SEL characteristics and contextual responses may help explain why, within Class 6, greater reported opportunity for risky play is associated with a small reduction in internal disposition, producing the observed suppression effect.ky play are linked to lower internal disposition.

Overall, children who are most regulated on the SEL subscales do not show the highest disposition toward risky play. In contrast, those with the strongest inclination toward risky play—Classes 4, 5, and 6—also appear most vulnerable on SEL indices, showing lower school readiness marked by higher aggression, hyperactivity, inattention, and difficulties with rule following. Although some rule breaking is typical in the early years and does not inevitably lead to later problems, longitudinal work suggests that for a subset of children with low-fear physiological profiles, consistent disregard for rules can elicit more power-assertive parenting, which in turn increases risk for antisocial behavior (Konchanska et al, 2018). This raises an important question for practice and policy: how much risky play is developmentally sufficient, and at what point might patterns of risk taking and rule breaking carry longer-term costs?

Sex as a Moderator in the Relationship between Opportunity and Disposition of Risky Play

Females were concentrated in Class 1 and Class 2 (52% and 17%, respectively), both profiles characterized by relatively few social-emotional difficulties. This pattern aligns with prior research indicating that males are more likely than females to exhibit social-emotional challenges, particularly externalizing behaviors (Chaplin et al., 2012; Chang et al., 2011;

Maguire, 2015; Thomson, 2018). This finding is further strengthened with observations of classes 4, 5 and 6 that are over presented by males.

After establishing the mediated pathways for disposition to risk, moderation analysis was conducted to examine whether the association between opportunity for risky play and disposition were varied for males and females. For most classes, the indirect pathway from SEL predictors to risky-play disposition via opportunity was comparable across males and females. In line with the hypothesis, however, two classes showed clear sex differences, with the strength of this indirect pathway varying between males and females. For Class 3: Moderately Compliant and Anxious, opportunity for risky play was a particularly strong mediator for females: 79% of the link between this SEL profile and females' disposition toward risky play was explained by opportunity. This suggests that their interest in risky play depends heavily on the opportunities adults provide, consistent with research showing that adults tend to grant males more independence and risk-taking encouragement, while offering girls more direct assistance, safety warnings and concern for minor injuries. (Morrongiello & Dawber, 1999; Morrongiello & Hogg, 2004).

For Class 6, there is an inconsistent mediation effect of opportunity for risky play, but it is stronger for males in comparison to females by 27%. This pattern fits broader evidence that males are more likely than females to display externalizing difficulties such as aggression, hyperactivity, and conduct problems in early childhood (Chaplin et al., 2012; Chang et al., 2011; Maguire, 2015; Thomson, 2018). In this context, males in Class 6 may be especially inclined to express their emotional and behavioral challenges through outward, high-energy forms of risky play, which could amplify the role that opportunity plays in shaping their risky-play disposition.

This helps explain why opportunity functions as a stronger mediator for males, even though the overall mediation pattern is inconsistent.

Implications of the Research

For Parents and Educators

This study allows us to take a person-centred view of children as they enter kindergarten. Instead of labelling children as simply ready or not ready for school, each child is understood as having a constellation of strengths and challenges. These constellations give teachers a useful way to observe and document children with the explicit aim of providing support. Targeted support based on these constellations can help children transition more smoothly into the academic environment; for example, children who are compliant and anxious may benefit from intentional efforts to build their confidence in the classroom. In this way, we are better able to see and respond to the child as a whole.

For children whose profiles resemble Class 2 and Class 3, a large part of their disposition toward risky play appears to stem from the opportunities adults provide. Given their social-emotional skills, it seems appropriate to encourage and scaffold these children and to design environments, such as a play-junk yard, that actively invite manageable risk (Kozlovsky, 2008). Even when their initial disposition to take risks is modest, gentle encouragement and access to challenging play may support their social-emotional learning and, in turn, foster greater confidence in engaging in risky play.

Through this study, we found that females' opportunities for risky play had a strong and significant association with their personal disposition to take risks, especially for females in Class 3 and Class 6. This highlights the need for educators and parents to continue providing opportunities for risky play and to reflect on any assumptions with respect to sex that they may

hold about females' capabilities. Such opportunities can strongly influence females' willingness to take risks and, in turn, support the development of their SEL skills.

For Policy

Currently, there is no formal testing of SEL skills in British Columbia that is actively used to inform instruction and interactions. However, teachers can be supported to view SEL as a constellation of skills and to observe these in their everyday practice. By noticing these constellations, they can recognize patterns in their students and respond with more targeted support.

At the same time, although there has been a surge in promoting risky play (Brussoni et al., 2015; Canadian Pediatric Society, 2024; SickKids, 2024), this study highlights the need for educators to receive training on how to offer appropriate encouragement and opportunities for risky play based on children's SEL constellations. Further investment is also needed in professional learning for both parents and educators that addresses their own biases in terms of males and females in relation to children's risky play.

Policy can also address the physical and regulatory conditions that influence children's access to risky play. Current safety standards and liability concerns can lead schools and early learning centres to unintentionally limit the kinds of challenges that support children's confidence and risk assessment (Canadian Pediatric Society, 2024; Brussoni et al., 2015). Children may also struggle to make sense of risky play when rules and expectations shift dramatically across the settings they move through each day. Early learning centres or after and before school programs often operate under stringent safety and licensing requirements, which can lead educators to tightly manage children's actions, minimize physical risk, and use frequent verbal cautions (Ramsden et al., 2026). In contrast, school playgrounds may provide less direct

supervision but rely on broad, sometimes inconsistently enforced rules to control risk (Brussoni et al., 2012; Ophea, 2025). This combination means that the same behaviors as climbing high, running fast, or engaging in rough-and-tumble play may be supported in one context and punished in another, leaving children uncertain about what is acceptable and potentially undermining their confidence in managing risk. Integrating child care into the school day through B.C.'s Seamless Day Kindergarten model may help offset this challenge by reducing the number of settings and therefore rule systems that children must navigate. When the same educator team provides early learning, kindergarten instruction, and out-of-school care in a single classroom, there is greater potential for shared expectations around risky play and more coherent messages about what kinds of risk-taking are acceptable, which may support children's confidence and SEL development.

An emerging consensus instead recommends an 'as safe as necessary' approach instead of 'as safe as possible approach' (Canadian Pediatric Society, 2024; Brussoni et al., 2015). Policies could support centres to redesign outdoor spaces for graduated challenge, make explicit that regulations do not require eliminating all risk, and provide funding and technical guidance so programs can meet safety codes while still offering meaningful risky play opportunities for children (Canadian Paediatric Society, 2024; Brussoni et al., 2015).

Limitations of the Study

Although the SEL instrument showed good reliability and validity, it relied solely on teacher report, and teachers may have had limited opportunities to observe some behaviors, particularly prosocial and helping behaviors, which could constrain the variability captured on these scales. This instrument then essentially captures SEL only in school-based contexts (Guhn & Goelman, 2011).

Second, important contextual factors such as family income and neighborhood characteristics were not included or controlled for in the present analyses, so unmeasured confounding cannot be ruled out (Imai, 2022). There could be other broader socio economic or community factors that could influence the observe associations and these have not been captured by the present study.

Thirdly, the sample is representative only of families who completed the EDI, and data were drawn from one Canadian province (British Columbia) of children. Additionally, the EDI data consists of children who attend public schools and do not include children from private and independent schools. Hence, patterns of SEL, risky play, and opportunities may differ in other jurisdictions with varying different curricula, demographic compositions, or play policies.

Lastly, the sample is representative only of families who chose to complete the optional CHEQ survey, so participation was self-selected and the findings may not generalize to children whose parents did not respond especially families from low income and/ or immigrant backgrounds.

Strengths of the Study

The study has several strengths. It draws on a large, population-level sample of kindergarten children, enhancing the precision of estimated effect and the ecological validity of the profiles. This gives increased confidence that the identified classes correspond to patterns that are likely to be encountered. The use of a person-centred approach to derive SEL profiles moves beyond single-variable models and captures naturally occurring configurations of strengths and vulnerabilities.

A further strength is the combined examination of children's dispositions toward risky play and their perceived opportunities, together with sex, which allows a more nuanced view of

how individual and contextual factors intersect. While there have been theoretical models to explain why children take risks, there have been very few studies that focus on transactional models of development. Considering how children's SEL profiles shape their opportunity and disposition to risky play allows to look at the bidirectionality between these two components.

Directions for Future Research

There are multiple pathways for future research stemming from this study. Firstly, subsequent research should include a broader set of variables that help to explain whether the associations from SEL profiles, risky play dispositions and opportunities remain after accounting for socio-economic and contextual environments. The variables could include but family income, parental education, number of siblings and neighborhood characteristics (Imai, 2022).

Secondly, the current findings would be enriched by qualitative research that explores how adults make sense of children's risky play for males and females in everyday practices. Interviews with parents and educators could provide insights on how they perceive children with different SEL profiles and what factors influence decision making while stepping on or holding back risky play. These qualitative insights could help explain some of the quantitative patterns observed in opportunities for risky play and would support the design of ongoing learning that directly target parental, educator and wider community beliefs.

Thirdly, there is value in assessing what level of risk is healthy for children. In this study, children with overall high SEL did not show the highest dispositions for risky play, and although the benefits of risky play have been demonstrated in multiple studies, the optimal level of risk has not yet been explored.

Additionally, there is value in examining patterns and influences in children's risky play for groups that resemble Class 6, who are characterized by overall low SEL. Longitudinal and

mixed-methods studies that track how these children's fear, autonomy, and risk dispositions develop over time in relation to educators' practices could clarify when risky play functions as a meaningful challenge and when it becomes overwhelming and suppresses their inner drive.

Lastly, there is value in extending the current cross-sectional mediation work into transactional, longitudinal designs. The present study already acknowledges bidirectionality by considering how children's SEL and behavioral profiles may influence adults' provision of risky-play opportunities. At the same time these risky play opportunities support coping, confidence, and social competence as stated in previous literature (Bahrenscheer & Sederberg, 2019; Brussoni et al., 2017; Sandseter, 2015; Sandseter et al., 2022). Completing this cycle empirically would require following children over time and testing whether SEL profiles predict later changes in adult behavior and whether those changes in turn predict subsequent shifts in children's SEL and risky-play dispositions.

Conclusion

This study shows that kindergarten children enter school with six distinct constellations of SEL strengths and challenges, and these profiles are closely linked to both their opportunities for and dispositions toward risky play. Opportunities for risky play, particularly for more cautious or anxious children and for females, emerged as a key way that adults' decisions and environments shape children's willingness to engage risk. Despite limitations related to teacher report, a single provincial context, and self-selected participation, the large population sample and person-centred approach provide a strong foundation for policies, practices, and future research for SEL and risky play.

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Appendix A: Domains and Subdomains of Childhood Experiences Questionnaire (CHEQ)

1. Physical Health & Well-Being
    a. Health
    b. Nutrition & Sleep
    c. Motor Skills & Experiences
2. Language & Cognition
    a. Language & Cognition
3. Social & Emotional Experience
    a. Peer Experiences
    b. Talking about Emotions
    c. Screen Time
4. Early Learning & Care
    a. Early Learning & Care
5. Community & Context
    a. General Activities
    b. Neighbourhood Experiences
    c. Demographics