ABSTRACT

Title of Thesis:	ASSOCIATIONS BETWEEN TEMPERAMENT PROFILES AND SOCIAL DEVELOPMENT IN EARLY CHILDHOOD
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The relationship between several dimensions of temperament and children's social development has been extensively examined, yet most of the extant literature has focused on the isolated impact of specific temperamental characteristics. Person-centered or profile-based approaches, on the other hand, account for complex combinations of multiple traits within an individual. This study seeks to adopt a person-centered approach to examine the concurrent relationship between previously generated profiles of parent-rated and teacher-rated temperament and psychosocial functioning in early-childhood. Person-centered analysis has the capacity to move beyond the identification of narrow risk factors to characterize groups of children who respond similarly to environmental demands and require similar levels of support. To examine the relationship between temperament profile membership and concurrent internalizing problem behaviors, externalizing problem behaviors, and social skills, multiple iterations of the modified BCH procedure were performed. Wald's chi-squared, pairwise comparison tests were then implemented to explore how different temperamental groups

diverged in their expression of problem behaviors and social functioning. Across home and school environments, higher levels of exuberance, greater negative emotionality, and lower behavioral regulation contributed to increased externalizing behavior concerns, whereas lower levels of exuberance, greater negative emotionally, and lower perceptual sensitivity contributed to greater internalizing behavior concerns. Analyses regarding the influence of temperament profile membership on social outcomes demonstrated that extreme levels of perceptual sensitivity, higher levels of exuberance, greater negative emotionality, and lower behavioral regulation contributed to weaker social functioning. Associations between perceptual sensitivity and psychosocial outcomes suggested a more complex relationship that was maintained by emotional regulation or soothability. Additionally, children's self-regulation demonstrated considerable nuance, such that subtle differences in the specific types of self-regulation asserted greater implications on the estimation of overall problem behaviors and social functioning. These results were commensurate with patterns found in existing literature regarding the complex influence of temperament on social developmental outcomes. A few of the current findings also provided novel insight to unique interactions among temperament characteristics that, to the author's knowledge, have never been explored with person-centered models before. The results of the current study supplemented the field's current comprehension of temperament and contributed to more meaningful accommodation of children's individual differences. Continued replication of person-centered literate establishes credibility for profile-based approaches in explaining the processes of child temperament and addressing children's psychosocial challenges in many different settings. Future person-research centered research should continue to examine the relationship between wide-ranging collections of temperament traits on social-developmental outcomes in a variety of contexts.

ASSOCIATIONS BETWEEN TEMPERAMENT PROFILES AND SOCIAL DEVELOPMENT IN EARLY CHILDHOOD

by

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Chapter 1: Introduction

Over the past several decades, empirical investigation of temperament has seen unprecedented growth, due in part to the theory's applicability across many scientific disciplines. What once emerged as the study of individual differences in infants' dispositions has now broadened to include many areas such as education, genomics, psychopathology, and neuroscience. For many scholars, practitioners, and educators, temperament provides a clearer picture of children's unique emotional and behavioral tendencies. These early-emerging temperamental differences establish young children's individuality and inform much of their subsequent development. Today, temperament can be formally defined as a collection of biologically based traits that appear early in life, remain relatively stable throughout development, and appear consistent across cultural and social contexts (Rothbart & Bates, 2006). Temperament is regarded as the biological foundation of children's responses to the environment, and such processes promote children's ability to evaluate and cope with environmental change. In fact, certain temperamental characteristics have been identified as predictors of children's behavior and social functioning in various contexts such as with parents, peers, or within a school environment (Sanson et al., 2004). To that end, many scholars within the field of temperament have made a concerted effort to understand central temperamental characteristics, with the aim of elucidating temperament's relation to a number of developmental and behavioral outcomes.

While a significant amount of empirical effort is spent attempting to explicate temperament's role in child development, a universal characterization of the taxonomy of factors or traits that comprise the construct are not yet agreed upon in the extant literature. Most existing models of temperament contain three central components or dimensions of temperament, which

broadly represent children's reactive tendencies and regulative capacities. These components are often referred to as negative affectivity, surgency, and effortful control (Rothbart et al., 2000). Rothbart and Bates' (2006) popular classification of temperament suggests that each higher-order dimension encompasses specific traits, with negative affectivity reflecting displays of negative emotion such as anger, fear, and sadness; surgency comprising positive emotionality, approach behaviors, activity level, and impulsivity; and effortful control indicating a child's ability to suppress impulses or negative responses to distressful situations (i.e. focusing, inhibitory control, perceptual sensitivity, and low-intensity pleasure). The vast majority of temperament research has explored the discrete impact of one temperament dimension or a few of the aforementioned temperament traits. However, child development is not determined by one dimension alone. The way in which a child navigates the physical and social world depends on the presence of several temperament characteristics that coalesce to shape social-emotional and adaptive functioning. This configuration of traits is known as a *temperament profile*, and empirical consideration of the interaction between coincident temperament traits has become increasingly more popular, with recent studies investigating the utility of person-centered or profile-based research approaches.

Person-centered or profile-based methodology suggests a more nuanced assessment of behavior by presuming that each temperament trait influences the expression of another (Planalp & Goldsmith, 2020). Such studies consider temperament in the context of the "whole child", challenging the notion that children who display broad behavioral similarities are therefore temperamentally homogenous. For instance, children who exhibit high levels of negative affectivity often demonstrate subtle differences on an individual trait level; some may be more fearful, whereas others may display greater anger. Consequently, a fearful child who asserts a

high level of self-regulation likely appears markedly different from an angry child who exhibits similarly high levels of self-regulation. Traditional variable-centered approaches, while useful in understanding the theoretical significance of broad dimensions of temperament, typically fail to detect such subtleties between children in a sample. Person-centered or profile-based approaches detect greater complexity by identifying subgroups or profiles of children who are not only similar on particular temperament traits but who also exhibit similar patterns of relationships among these traits (Laursen & Hoff, 2006). While there appears to be a general lack of agreement regarding the true content and number of childhood temperament profiles, the literature suggests that a small number of profiles account for most individual differences in children and that commonalities exist across many profile-based solutions (see Gartstein et al., 2017 for review). In other words, there may be several legitimate ways to explain combinations of unique temperament dimensions. Martin et al. (2020) draw attention to broad clusters of similarities among recent person-centered profiles of temperament, emphasizing commonalities despite the variation of research methodology included in the development of each model. Findings such as these are particularly notable, as general agreement between existing profiles implies merit in the use of profile-based or person-centered research. With that said, it is crucial to establish agreement on shared foundational aspects of temperament profiles, so as to strengthen the existing research base and to assist in the further study and practical application of person-centered research.

The current study aims to contextualize temperament profiles formerly generated from the current dataset within the broader anthology of profile-based research and to relate such profiles to children' social functioning and problem behavior. While traditional variable-centered approaches contribute to a greater understanding of broad temperament dimensions, the

findings of such studies are only valuable insofar as they apply to a relatively homogenous population. Accounting for the complexity of children's individual differences by using person-centered methodology allows scholars to more accurately relate temperament to the development of certain behavioral outcomes, subsequently informing diagnostic judgements and intervention planning in both clinical and educational settings. Additionally, using profile-based methodology contributes to a clearer and more comprehensive understanding of individual differences in childhood behavior, such that all stakeholders in children's development can better anticipate and more easily communicate the holistic social-emotional needs of each unique child.

Chapter 2: Literature Review

Research on temperament profiles spans across several developmental stages, populations, outcomes, and study designs. Some of the most well-known person-centered models of temperament were developed from research conducted decades ago, yet these models remain the basis of investigation in current literature. Two of the most recognized models were developed by Thomas and Chess (1977) and Caspi and Silva (1995).

Thomas and Chess (1977) identified three types of infants based on parents' reports of nine temperament dimensions: activity level, rhythmicity, approach, adaptability, threshold of responsiveness, intensity of reaction, mood, distractibility, and attention span/persistence. The resulting profiles were generated from inductive content analysis of interviews held with parents, and children were categorized as either difficult, easy, or slow-to-warm-up. The easy group, which made up approximately 40% of the sample, had no trouble approaching new situations and people and quickly adapted to change. The slow-to-warm-up group, which made up 15% of the sample, exhibited mildly negative responses to new stimuli and more cautiously approached new situations and people. Lastly, the difficult group, which made up about 10% of the sample, withdrew from new stimuli, was emotionally sensitive, and often expressed negative emotions. However, Thomas and Chess' model did not capture the individual differences of *all* children, as 35% of the sample did not meet inclusion criteria for any of the profiles. This created speculation regarding the nature of the unrepresented children and sparked the continuation of profile-based research on this matter.

Several years later, Caspi and Silva (1995) investigated early-childhood temperament in relation to adult personality through the Dunedin Multidisciplinary Health and Development Study of New Zealand. They identified five categories of 3-year-old children based off of several

fine-grained behavioral characteristics exhibited during in-lab assessment procedures. The observed behavioral characteristics were explained by three larger factors of temperament: lack of control, approach, and sluggishness. A subsequent cluster analysis resulted in five profiles that were categorized as undercontrolled, inhibited, confident, reserved, and well-adjusted. Well-adjusted children made up 40% of the sample and were within normal limits on all behavioral characteristics. Confident children, who made up 28% of the sample, were eager to engage with assessment materials and adjusted well to the assessment situations. Reserved children made up 15% of the sample and were mildly timid and somewhat uncomfortable during assessment. Undercontrolled children, who made up 10% of the sample were irritable, impulsive, and distractible during assessment. Finally, inhibited children comprising 8% of the sample, exhibited extreme shyness and fearfulness and had difficulty concentrating on the assessment tasks. Using a more refined analytical procedure, Caspi and Silva were able to extract profiles for all children in their sample and were one of the first research teams to generate profiles solely through laboratory observation.

Thomas and Chess (1977) and Caspi and Silva (1995) have been especially influential in popularizing the use of profile-based methodology as an acceptable means of categorizing children's unique temperamental dispositions. Since the emergence of such archetypes, several other scholars have introduced additional profile-based solutions, each attempting to establish their own representation of children's individual differences. Thus, the following review seeks to provide an overview of the progression of empirical investigation concerning the role of temperament in children's social development. So as to align with Rothbart and Bates' (2006) theory of temperament, the review will exclude profile-based research that comprises dimensions other than motor, emotional, or attentional reactivity and regulation. Additionally, the review

will exclude research meant to subtype clinical populations (i.e. children with ADHD), instead presenting a more universal interpretation of children's individual differences. Regardless of inclusion parameters, the following collection of profiles sufficiently represents the variability of person-centered research on early-childhood temperament (see Table 1).

Table 1

Summary of Person-Centered Research on Early-Childhood Temperament

	Age of Children	Informant	# of Variables	Analytic Procedure	# of Profiles	Profile Labels
Thomas & Chess (1977)	.5 - 1	Parent	9	ICA	3	1) Difficult, 2) easy, 3) slow to warm up
Caspi & Silva (1995)	3	Lab	3	CA	5	1) Undercontrolled, 2) inhibited, 3) confident, 4) reserved, 5) well-adjusted
Aksan et al. (1999)	3.5 – 4.5	Parent	3	CFA	2	1) Controlled-expressive, 2) non-controlled-expressive
McClowry (2002)	4 - 12	Parent	4	PFA	4	1) Industrious, 2) social-eager to try, 3) high maintenance, 4) cautious/slow to warm up
Komsi et al. (2006)	.5 – 5.5	Parent	3	CA	3	1) Resilient, 2) undercontrolled, 3) overcontrolled
Janson & Mathieson (2008)	1.5 - 9	Parent	3	ISOA	5	1) Undercontrolled, 2) confident, 3) unremarkable, 4) inhibited, 5) uneasy
Sanson et al. (2009)	.5 - 4	Parent	3	CA	4	1) Non-reactive outgoing, 2) high attention regulation, 3) poor attention regulation, 4) nonreactive/outgoing
Van den Akker et al. (2010)	2 - 4	Parent	3	LPA	3	1) Typical, 2) expressive, 3) fearful
McClowry et al. (2013)	5 - 7	Teacher	4	CA	3	1) Industrious, 2) high maintenance, 3) intermediate
Laible et al. (2014)	4 - 9	Parent	4	LPA	4	1) Moderate regulation and moderate negative emotionality, 2) very low regulation and high anger, 3) low regulation and high negative emotionality, 4) high regulation and low negative emotionality
Prokasky et al. (2017)	4	Parent	7	CA	6	1) Unregulated, 2) high reactive, 3) bold, 4) average, 5) well-adjusted, 6) regulated
Hawes et al. (2022)	3 - 6	Lab	7	LPA	4/5	3 years: 1) typical, 2) surgent, 3) dysregulated, 4) sluggish 6 years: 1) typical, 2) sluggish, 3) outgoing, 4) active impulsive, 5) negative affect

Note. Age of children reported in years.; CA = Cluster Analysis, LPA = Latent Profile Analysis, CFA = Configural Frequency Analysis, ICA Inductive Content Analysis, PFA = Principal Factor Analysis, ISOA = I-States as Objects Analysis. Adapted from "A person-centered approach to understanding child temperament at ages 3 and 6" by M.T. Hawes, M.C. Finsaas, T.M. Olino, & D.N. Klein, 2022, *European Journal of Personality, 36*(1), 91-107.

A Timeline of Person-Centered Research on Child Temperament

At the initial inception of person-centered research, methodology was quite limited in scope. Most empirical studies explored early-childhood temperament by means of laboratory observation or clinical judgement, and cluster or factor analytical techniques were used to establish profile-based solutions. Aksan et al. (1999) recognized the methodological limitations of popular theoretical models at the time and sought to improve analytic shortcomings by exploring early-childhood temperament through a lesser-known technique called configural frequency analysis (CFA; Von Eye, 1990, 1998). Aksan et al. (1999) also pioneered the development of profiles using parent ratings of child temperament collected via questionnaire. In a sample of U.S. American children, Aksan and colleagues identified two sets of profiles based on maternal responses to the Children's Behavior Questionnaire (CBQ; Rothbart et al., 1994). When participating children were 3 years, 6 months old and 4 years, 6 months old, their mothers characterized their behavior on eight scales of temperament, which were separated by factor analysis into three overarching dimensions: approach, negative affectivity, and behavioral control. The three consequent dimensions were then subjected to configural frequency analysis, which identified a controlled-nonexpressive type and a non-controlled-expressive type for both 3-year-old and 4-year-old groups. Children characterized as controlled-nonexpressive (8%) were high in control and low in both approach and negative affectivity. The non-controlled-expressive group (7%) displayed low levels of control and high levels of both approach and negative affectivity. Compared to preceding research, Askan and colleagues' profiles seemed most similar to Caspi and Silva's (1995) inhibited and undercontrolled types. However, controlled-nonexpressive children were low in shyness as well as other dimensions of both negative affectivity and approach, unlike inhibited children who were characterized by extreme shyness

and fear. Similarly, Aksan and colleagues' non-controlled-expressive group was higher in shyness, negativity, activity, and approach, only comparable with Caspi and Silva's (1995) undercontrolled group in regard to low behavioral control and attentional focusing. Additionally, Aksan et al. could not identify a typical/average or well-adjusted group, primarily due to their rigorous analytical procedures, which revealed that most children were not temperamentally similar enough to constitute membership in one distinct group. In fact, only 15% of the children in their sample satisfied both between-category distinctiveness and within-category homogeneity criteria to be explained by one of the two temperament types. This finding raised questions about the empirical utility of classifying the majority of children into temperament types.

Much like Aksan and colleagues, McClowry (2002) questioned whether children could truly be explained by one temperament category and also paved the way for the use of standardized questionnaires in profile-based temperament research. In her study of U.S. American children (4 to 12 years old), McClowry employed one of her own validated measures, the School-Age Temperament Inventory (SATI; McClowry, 1995), to measure child temperament across four broad dimensions: negative reactivity, task persistence, approach/ withdrawal, and activity. Children's scores on each of the four dimensions were then subjected to a principal factor analysis, which indicated that 42% of McClowry's sample were classified by a four-factor model of temperament, exemplifying profile groupings similar to those of Thomas and Chess (1977). Children were characterized as belonging to either easy or challenging higher order categories, both of which comprised two additional subtypes. Social/eager to try children, who were high in approach and low in negative reactivity, represented 5% of the sample and appeared to parallel Thomas and Chess' easy subgroup. However, McClowry identified a second type of 'easy' child, who exhibited low activity, low negative reactivity, and high task

persistence. These children, who were deemed industrious, categorized approximately 6% of the sample and diverged from Thomas and Chess' easy subgroup by valuation of task persistence. Task persistence was not central to Thomas and Chess' investigation, most likely due to the age of participants, as task persistence tends to become more salient when children reach school-age. Nevertheless, industrious children were rated as displaying low negative reactivity, which corresponded with Thomas and Chess' (1977) conceptualization of the 'easy' child. Additionally, 4% of children fell within both of the aforementioned 'easy' categories, indicating potential overlap or subtlety in differences between comparable categories. Similarly, children regarded as having more challenging temperamental dispositions were characterized by two profiles. High maintenance children, who made up 8% of the sample, were high in activity, high in negative reactivity, and low in task persistence. Another 8% of children were labeled as cautious/slow to warm up, described by high withdrawal and negative reactivity. Finally, 6% exemplified both types of challenging temperaments. Akin to Askan and colleagues' profile classification system (1999), McClowry's model did not characterize all children within her sample. McClowry reasoned that such a result was acceptable in the spirit of person-centered methodology, as it is more representative to define profiles not by rigid cutoff criteria but by degree of fit. However, this notion only applies in so far as factor analytic procedures are concerned. The advancement of person-centered statistical procedures removed the necessity for cutoff criteria in the identification of profiles, shifting away from identifying groups of children simply by extreme scores on a collection of temperament characteristics. Nonetheless, McClowry's (2002) four-profile solution provided credibility to existing theory and initiated discussion as to whether children can be explained by multiple temperament categories at one time or perhaps even over time, especially as children approach middle childhood.

Komsi et al. (2006) sought to measure the continuity of temperament from infancy (6 months) to middle childhood (5 years, 6 months) through both variable-focused and person-centered perspectives. Adhering to Rothbart's (2006) theoretical framework, Komsi and colleagues collected maternal ratings of Finish children's behavior via the Infant Behavior Questionnaire (IBQ, Rothbart, 1981) and the Children's Behavior Questionnaire (CBQ, Rothbart et al., 2001). Temperament dimensions were organized into three "superconstructs" or composites for both infant and middle childhood groups. In infancy, temperament was organized into composite factors of activity level, positive affectivity, and negative affectivity. In middle childhood, temperament was measured by composite factors of extraversion, effortful control, and negative affectivity. Results of a cluster analyses identified a three-profile solution that reliably characterized children from infancy to middle childhood and paralleled previously established temperament types. The first profile, described as resilient (32%), consisted of children with above average levels of activity, positive affectivity, extraversion, effortful control, and below-average levels of negative affectivity in infancy and middle childhood. Next, undercontrolled children (34%) were characterized by relatively high activity and negativity in infancy, combined with relatively weak child self-regulative capacities in middle childhood. Lastly, children in the third cluster were described as overcontrolled (34%). Children categorized by this profile exhibited low levels of activity and positive affectivity but displayed average levels of negative affectivity in infancy. In middle childhood, overcontrolled children displayed high levels of effortful control and negative affectivity, as well as very low levels of extraversion. Komsi and colleagues' (2006) findings bolstered support for Rothbart's (2006) theoretical framework by demonstrating the complex interaction between reactive and regulatory

processes across development and verifying the continuity of temperament profiles throughout early childhood.

Janson and Mathiesen (2008) were also interested in exploring the succession of temperament profiles over time, particularly by using more advanced analytic methods. They studied Norwegian children at 18 months, 30 months, 4–5 years, and 8–9 years of age and developed a five-profile classification based on maternal ratings of activity, sociability, emotionality, and shyness via the Emotionality, Activity and Sociability Temperament Questionnaire (EAS; Buss & Plomin, 1984). The resulting typology, generated by an I-States as Objects Analysis (ISOA; Bergman et al. 2003), included an undercontrolled type, a confident type, an unremarkable type, an inhibited type, and an uneasy temperament type. The under-controlled type, which closely resembled Caspi and Silva's (1995) undercontrolled profile, was characterized by low shyness, high sociability, high activity, and high negative emotionality. The confident type, akin to Caspi and Silva's confident profile, displayed low shyness, low negative emotionality, high activity, and moderately high sociability. The unremarkable type mirrored Caspi and Silva's well-adjusted group, evidenced by average values on all four temperament dimensions. The inhibited type, which bore resemblance to Caspi and Silva's reserved type, was characterized by very low activity, low sociability, and high shyness. Lastly, the uneasy type, characterized by moderately high shyness and negative emotionality, was similar to Caspi and Silva's inhibited cluster. However, Janson and Mathieson's uneasy type displayed slightly higher levels of activity as compared to Caspi and Silva's inhibited group. Janson and Mathieson's analyses also revealed stability in profile membership across developmental periods. Children in their sample mostly remained in the same temperament profile as they aged, with the exception of a small percentage of children who followed one of two patterns; some children who initially

started out in the confident group were eventually classified as unremarkable, and some children who were initially described as uneasy were eventually described by the inhibited type. Janson and Mathieson also noted a significant difference in the overall prevalence of temperament profiles as children aged, with the confident profile being the most common at 18 months of age (32%), the uneasy profile being the most frequent at both 30 months (27%) and 4–5 years of age (32%), and the unremarkable profile being the most common at 8–9 years of age (39%). Altogether, these results corroborate Rothbart and Bates' (2006) theory that suggests that as children age, they develop self-regulatory capacities (i.e. effortful control) that may moderate their approach and negative emotional systems. However, this is only speculation, as Janson and Mathieson did not include a direct measure of effortful control/regulation in their study. Regardless of this limitation, the commonalties between Janson and Mathieson's (2008) and Caspi and Silva's (1995) five-profile solutions demonstrated that profile-based research on childhood temperament could generalize across research designs and sample demographics (age, culture, etc.).

While advancements like these persisted for nearly two decades, person-centered researchers had yet to connect children's temperament profiles to adjustment in both home and school contexts. Upon recognizing this gap, Sanson et. al (2009) collected parent, teacher, and self-reported data to explore the impact of temperament style on later behavior problems, social skills, and school adjustment. However, Sanson and colleagues used maternal ratings alone to develop their final profile-based solution. Sanson et al. (2009) measured Australian children's temperament each year, starting when children were 4-8 months old and concluding when the children turned 4-years-old. Exploratory factor analyses of the Revised Infant Temperament Questionnaire (RITQ; Carey & McDevitt, 1978), the Toddler Temperament Scale (TTS; Fullard

et al., 1978), and the Childhood Temperament Questionnaire (CTQ; Thomas & Chess, 1977) revealed several factors that were subsequently aggregated on three broad dimensions of temperament: inhibition, attention regulation, and reactivity. Cluster analysis of the four time periods revealed four main temperament profiles labeled nonreactive/outgoing, high attention regulation, poor attention regulation, and reactive/inhibited. The nonreactive/outgoing group (25%) was characterized by low inhibition, moderately high regulation, and low reactivity. The high attention regulation group (27%) was characterized by high attention regulation, moderately high inhibition, and moderately low reactivity. The poor attention regulation group (28%) was characterized by low attention regulation, moderately high reactivity, and moderately low inhibition, and the reactive/inhibited group (20%) was characterized by high reactivity, high inhibition, and moderately low regulation. Sanson et al.'s (2009) nonreactive/outgoing group was most similar to Thomas and Chess' (1977) easy classification, while the reactive/inhibited and high attention regulation groups were similar to Thomas and Chess' difficult and slow to warm up types. However. Sanson et al.'s poor attention regulation cluster did not have an equivalent in Thomas and Chess's (1977) model, suggesting that the addition of regulatory traits (i.e. attention regulation) in the identification of temperament profiles provided more nuance and uncovered additional variation in children's individual differences. Additionally, even though teachers were not asked report their perspective of children's temperament, Sanson et al. (2008) established their role as valuable informants of children's development by asking teachers to rate concurrent psychosocial outcomes of temperament profiles in the school environment (i.e. behavior problems, social skills, school functioning).

As person-centered research continued to grow and discrepancies in the number and content of established profiles increased, so did the analytical techniques used to develop such

profiles. Latent profile analysis (LPA) quickly became one of the most recognized analytical methods in profile-based research (Gibson, 1959; Muthén &Muthén, 2000). Van den Akker et al. (2010) were one of the first research teams to utilize this technique to generate early-childhood temperament profiles. Van den Akker and colleagues investigated temperament profiles in Dutch children (2 to 4 years) by investigating mother-rated activity level, anger proneness, and social fearfulness, as measured by the Toddler Behavior Assessment Questionnaire (TBAQ, Goldsmith et al. 1991). Using latent profile analysis, they identified a three-profile framework, similar to that of Komsi et al. (2006), which included a typical profile, an expressive profile, and a fearful profile. The typical group was described by low levels of social fear, anger proneness, and activity level. This group was most similar to Komsi and colleagues' resilient group. The expressive group, closely related to Komsi et al.'s undercontrolled group, was described by low levels of social fear, and high levels of anger proneness and activity level. Lastly, a fearful group was described by high levels of social fear, and intermediate levels of anger proneness and activity level. This group was most similar to the overcontrolled type identified by Komsi and colleagues. In addition to identifying a three-profile solution, Van den Akker et al. (2010) performed latent growth modeling to investigate parenting behavior in relation to the trajectory of temperament profiles over development, which had never been done before. Their findings subsequently posed questions about the different environmental mechanisms that impact the development of temperament throughout childhood.

Motivated by such questions, McClowry et al. (2013) investigated the impact of child temperament in an educational context, developing temperament profiles of children (5 to 7 years old) attending economically disadvantaged schools in a large urban area of the United States. This endeavor was especially groundbreaking, as McClowry and colleagues were the first

person-centered research team to assess temperament solely through the perspective of teachers. Using the Teacher School-Age Temperament Inventory (T-SATI; Lyons-Thomas & McClowry, 2012), McClowry et al. measured student's temperament on four aggregate variables: negative reactivity, task persistence, withdrawal, and motor activity. A two-step cluster analysis identified three temperament profiles, two of which were closely related to McClowry's (2002) previous profile-based solution derived from parent reports. In this sample, McClowry and colleagues identified high maintenance and industrious profiles that were commensurate with prior investigation. Children characterized as industrious (23%) exhibited high levels of task persistence and low levels of negative reactivity and activity, while high maintenance children (37%) displayed low task persistence and high levels of negative reactivity and activity. The final cluster, however, did not neatly fall into either the industrious or high maintenance groups and was thus labelled intermediate (40%). What is particularly notable about McClowry et. al's (2013) profile solution is the absence of the temperament dimension, withdrawal. What seemed to have provided greater nuance in the development of McClowry's (2002) parent-reported profiles did not reach significance in profiles derived from teacher ratings of temperament. McClowry et al. (2013) suggested that their findings reflected differences in informant ratings of temperament, particularly when comparing teachers' and parents' perspectives of child temperament. For example, McClowry and colleagues argued that teachers may be privier to traits that can be considered disruptive in nature, overlooking internally oriented traits such as withdrawal or shyness. At that time, low convergence among parents' and teachers' ratings of child behavior was already fairly established in the extant literature (De Los Reyes & Kazdin, 2005; Gresham et al., 2010), though McClowry et al. (2013) were the first to demonstrate this notion in the development of profiles.

Laible et al. (2014) also sought to explore the impact of children's temperament profiles in an educational context, using a person-centered approach to examine the relationship between children's negative emotionality, self-regulation, and prosocial behaviors throughout middle childhood. To measure this relationship over time, Laible et al. utilized the U.S. NICHD Study of Early Childcare and Youth Development, focusing specifically on behavioral data collected when children were 4 years old, 7 years old, and 9 years old. Children's temperament was characterized by maternal ratings on the Children's Behavior Questionnaire (CBQ; Rothbart et al., 2001), from which aggregate variables of effortful control, sadness, anger, and fear were subjected to a subsequent latent profile analysis. Results revealed a four-factor model that was relatively consistent with much of existing research, identifying a 'moderate regulation and moderate negative emotionality' group (52%), a 'very low regulation and high anger emotionality' group (5%), a 'low regulation and high negative emotionality' group (34%), and a 'high regulation and low negative emotionality' group (10%). Of note, was the presence of a small subgroup of children differentiated from children characterized as low regulation and high negative emotionality by high levels of anger. While Laible et. al (2014) warned readers to interpret these results with caution, the appearance of a very low regulation and high anger emotionality group raised questions about the empirical utility of considering each fine-grained temperament dimension in the development of temperament profiles as opposed to using an aggregate measure of negative emotionality or emotional reactivity.

Prokasky et. al (2017) considered the usefulness of such a method, suggesting that nuanced differences between individual temperament dimensions may have gone unnoticed in previous person-centered approaches. Using a large national sample of U.S. American children, Prokasky and colleagues categorized three different samples of 4-year-olds on seven individual

dimensions of temperament measured by the Children's Behavior Questionnaire (CBQ; Rothbart et al., 2001): activity, anger, approach, fear, shyness, attentional focusing, and inhibitory control. Traditional cluster analysis resulted in a six-profile solution, though the proportion of children in each group was not reported. The first of the six types, unregulated, was marked by high activity, anger, and approach, average fear and shyness, and very low attentional focusing and inhibitory control. The second type, high reactive, was described by high anger and fear, average activity and inhibitory control, and average to high approach and shyness. The next type was labeled as bold and was characterized by high activity and approach, very low fear and shyness, and average anger, attentional focusing, and inhibitory control. Next, an average type, was marked by average scores on almost all temperament variables, except for approach scores which tended to be low. The fifth group, called well-adjusted, was described by high regulatory skills and average scores on all other dimensions. The last cluster was called regulated and was characterized by very low activity, anger, and approach, average fear and shyness, and very high attentional focusing and inhibitory control. Prokasky and colleagues found many similarities between their six-profiles solution and select profiles from the work of Caspi and Silva (1995) and Sanson et. al (2009). For instance, the unregulated cluster seemed similar to that of Caspi and Silva's (1995) undercontrolled group, and the well-adjusted cluster mirrored that of Caspi and Silva's well-adjusted group. Additionally, Prokasky and colleagues' regulated profile shared characteristics with Sanson et. al's (2009) high attention regulation group, as well as with Caspi and Silva's reserved group, as evidenced by shared high levels of attention and inhibitory control. Lastly, Prokasky et. al compared their high reactive cluster to the reactive/inhibited group identified by Sanson et al., due to similar high scores on reactivity and average to low scores on regulation. While Prokasky et. al (2017) substantiated common themes found among

previous person-centered research, they also uncovered subtle differences most likely attributed to the use of a more fine-grained assessment of temperament. For example, average and bold clusters were similar on most dimensions of temperament except for fear, suggesting that fear is an important distinguishing component of temperament that would have otherwise been obscured by the amalgamation of variables in a composite of negative emotionality. Prokasky et. al. argued that this is true not only for the dimension of fear, but also for dimensions of inhibitory control and anger, verifying the suspicions of Laible et al. (2014). Prokasky et al.'s (2017) findings warranted continued development of person-centered investigation of children's temperament, especially by application of more complex and fine-tuned methodology.

Hawes et. al.'s (2022) study represents the current state of person-centered research, accurately reflecting how such research has been refined over the past several years. In their recent study of U.S. American children, Hawes and colleagues assessed temperament through multiple lenses, seeking to address prior model estimation and classification issues. Hawes and colleagues also sought to investigate the association between temperament profiles derived by laboratory observation and individual temperament dimensions measured through mother-rated questionnaires. When children were 3 years of age and 6 years of age, Hawes et al. administered the Laboratory Temperament Assessment Battery (Lab-TAB; Goldsmith et al., 1995), which measured several behavioral domains of temperament that were later aggregated into summary variables of activity, anger, fear, impulsivity, positive emotionality, sadness, and sociability. Hawes et al. also collected questionnaire data on children's temperament through maternal ratings on the Children's Behavior Questionnaire (CBQ; Rothbart et al., 2001), though such ratings were compared to profiles during post-hoc analyses and were not utilized in the extraction of the profile solution. Latent profile analysis of laboratory-based observational data

identified separate models for 3-year-old and 6-year-old children, and group membership was compared across waves. At 3 years of age, a four-factor model was generated, revealing a typical group (50%), with average scores on all temperament characteristics; a surgent group (37%), with high levels of activity, impulsivity, positive emotionality, and sociability; a dysregulated group (8%), with moderately high levels of anger, impulsivity, sadness, and activity; and a sluggish group (5%), with moderately low levels of activity, positive emotionality, and sociability. At 6 years of age, a five-profile solution was selected as the best fitting model, and similar to profiles found at 3-years-old, typical (37%) and sluggish (19%) groups were identified. However, an outgoing (29%), active impulsive (8%), and negative affect (8%) type also emerged. Children identified as outgoing were defined primarily by high sociability; the active impulsive group was defined by very high activity, impulsivity, positive emotionality, and sociability; and the negative affect type was defined by high anger, sadness, and fear. While the 3-year-old and 6-year-old groups generated by Hawes et al. (2022) are consistent with previously established models, concurrence of the profiles with mother-rated temperament uncover more nuance. Once profile solutions were established for both 3-year-old and 6-year-old cohorts, Hawes and colleagues explored the concurrent association between profile membership and mother-rated temperament as explained by all 15 dimensions of the Children's Behavior Questionnaire (CBQ; Rothbart et al., 2001). Treating each mother-rated temperament dimension as a continuous outcome variable, Hawes et al. used a modified BCH analytical procedure (Vermunt, 2010) to estimate the correspondence between informant ratings. Most of the similarities identified between mother-rated temperament and profile membership were theoretically sound. For example, at both ages, the sluggish group was higher in shyness and lower in surgency, activity, impulsivity, and smiling/laughter than most or all other groups.

However, the dysregulated group was rated by mothers as less impulsive than the typical group, and there were no differences between the two in regard to mother-reported anger or sadness. Similarly, the negative affect group did not differ from the typical group on mother-rated anger and sadness, which is concerning given the distinguishing characteristic of the latent classification. Hawes et. al (2022) suggest that such inconsistencies indicate lower concordance between mother-rated questionnaires and observational methods for assessing temperament, though that is not to say that either method of data collection is inferior or inaccurate. Children's behaviors may change based on the constraints of any given situation; thus, differences across contexts are meaningful and should be accounted for in the literature. Regardless, emergent patterns of profile typology have been supported across many different methodological designs (i.e. parent-report, laboratory observation), as evidenced by the present review of literature.

All in all, increasing the complexity of person-centered approaches (i.e. multiple informants) comes with challenges in interpreting results but also affords greater specificity of results across contexts. Despite differences inherent in person-centered research, the continued identification of common themes among existing profiles establishes credibility for profile-based approaches in explaining the processes of child temperament and addressing children's psychosocial challenges in many different settings.

Commonalities Among Observed Profiles of Child Temperament

It is impossible to consolidate *all* person-centered research on child temperament, especially as such research uses different conceptualizations of temperament, as well as diverse measurement procedures. However, simply identifying commonalities within extant literature contributes very minimally to the increased understanding of temperament as a multifaceted and often context-dependent construct. Well-rounded analysis of such person-centered research is

instrumental in not only identifying gaps or limitations within the extant literature but also emphasizing nuance and complexity offered by methodological differences. For instance, the distinction between 'personality' and 'temperament' is oftentimes unclear. Whereas some researchers view temperament as separate from personality, others consider temperament as the observable manifestation of a child's developing personality (Janson & Mathiesen, 2008). Rothbart and Bates (2006) argue that temperament, which is biologically based, interacts with the environment to ''grow'' a personality, which includes a child's theory of mind, core values, and coping strategies. Therefore, variables such as social competence, academic achievement, and motivation would not fall under what is theoretically agreed upon as 'temperament'. However, the addition of non-temperament dimensions to person-centered research may not be unfounded. In the spirit of person-centered research, these elements add additional context to profiles.

Additionally, there are general differences in analytical procedures used to create profiles or clusters. For instance, Aksan et al. (1999) used configural frequency analysis, which allowed for more stringent examination of within-category homogeneity in the development of their two-profile solution. Janson and Mathieson (2008) also used a unique analytical procedure, known as I-States as Objects Analysis, to measure temperamental processes over an entire developmental period. Other common analytical procedures are principal factor analysis (McClowry, 2002), cluster analysis (Caspi & Silva, 1995; Komsi et al., 2006; Sanson et al., 2009; McClowry et al., 2013; Prokasky et al.,2017), and latent profile analysis (Van den Akker et al., 2010; Laible et al., 2014; Hawes et al., 2022).

Person-centered research also commonly varies in informant type and demographic of samples. Some studies rely on parent, teacher, and self-reported data (Sanson et al., 2009) while

other studies only utilize parent-reported data (Thomas & Chess, 1977; Caspi & Silva, 1995; Janson & Mathiesen, 2008) or teacher-reported data (McClowry et. al, 2013). Many studies also rely on laboratory observation to assess children's temperament characteristics (Hawes et al., 2022). The characteristics of target populations also change frequently from study to study. Profiles emerge in samples from New Zealand (Caspi & Silva, 1995), Finland (Komsi et al. 2006), Australia (Sanson et al., 2009), the Netherlands (Van den Akker et al., 2010), Norway (Janson & Mathiesen, 2008), the United States of America (Thomas & Chess, 19977; Aksan et al., 1999; McClowry, 2002; McClowry et al., 2013; Laible et al., 2014; Prokasky et al., 2017; Hawes et al., 2022), and many more geographic locations. Sample ages also range from infancy to adolescence, and some researchers focus on specific populations like twins (Scott et al., 2016) or adopted children (Beekman et al., 2015). However, among all of these differences, broad similarities can be identified in previously observed profiles of childhood temperament.

Many of the temperament dimensions applied in person-centered research can be related to three specific dimensional themes, closely related to Rothbart and Bates (2006) conceptualization of temperament; surgency, reactivity, and self-regulation. However, such dimensional similarities may not be obvious at first, because each element asserts many different labels. Reactivity, which can be defined as emotional impulsivity, is sometimes labeled as negative emotionality, negative affectivity, or irritability (Sanson et al., 2004). Surgency, which explains responses to novel situations, is sometimes referred to as approach-withdrawal, activity, impulsivity, or sociability. Self-regulation explains processes that inhibit reactive tendencies and can sometimes be called effortful control, task persistence, non-distractibility, soothability, or delay of gratification (Rothbart & Bates, 2006). Across most person-centered studies of child

temperament, a combination of the aforementioned traits is assessed and analyzed to create a collection of profiles.

Although each of the aforementioned studies found between two to six qualitatively different types of temperament profiles among children, many models identified an exuberant/regulated temperament type, an exuberant/unregulated temperament type, and an inhibited/regulated temperament type (See Table 2). An exuberant/regulated type is often characterized by low shyness, low negative emotionality, high activity, and high sociability (social/eager to try, McClowry, 2002; resilient, Komsi et al., 2006; confident, Janson & Mathieson, 2008; nonreactive/outgoing, Sanson et al., 2009; bold, Prokasky et al., 2017), while an exuberant/unregulated type is often represented by impulsivity, low effortful control, high approach, average to high emotionality, and high activity (undercontrolled, Caspi & Silva, 1995; high maintenance, McClowry, 2002; undercontrolled, Komsi et al., 2006; undercontrolled, Janson & Mathieson, 2008; unregulated, Prokasky et al., 2017). An inhibited/regulated child typically exhibits low activity, low approach, low sociability, and high behavioral control (overcontrolled, Komsi et al., 2006; inhibited, Janson & Mathieson, 2008; regulated, Prokasky et al., 2010). Though, some researchers have identified an inhibited/unregulated subtype of the traditional inhibited profile that is most notably marked by high levels of negative reactivity and moderately low levels of approach, activity, and regulation (cautious/slow to warm up, McClowry, 2002; uneasy, Janson & Mathieson, 2008; reactive/inhibited, Sanson et al. 2009; high reactive, Prokasky et al., 2017). Many studies also include an average/typical temperament type defined by approximately average scores on most or all temperament dimensions (well-adjusted, Caspi & Silva, 1995; unremarkable, Janson & Mathieson, 2008; average or well-adjusted, Prokasky et al., 2017; typical, Hawes et al., 2022).

Table 2

Common Themes in Observed Profiles of Reactivity and Regulation

Common Profile Type	Characteristics	Comparable Profiles
Exuberant/Regulated	High surgency, low reactivity, average to high regulation	Social/eager to try (McClowry, 2002) Resilient (Komsi et al., 2006) Confident (Janson & Mathieson, 2008) Nonreactive/outgoing (Sanson et al., 2009) Bold (Prokasky et al., 2017)
Exuberant/Unregulated	High surgency, average to high reactivity, and low regulation	Non-controlled-expressive (Aksan et al., 1999) High maintenance (McClowry, 2002) Undercontrolled (Komsi et al., 2006) Undercontrolled (Janson & Mathieson, 2008) Unregulated (Prokasky et al., 2017)
Inhibited/Regulated	Low surgency, average to low reactivity, and high regulation	Controlled-nonexpressive (Aksan et al., 1999) Overcontrolled (Komsi et al., 2006) Inhibited (Janson & Mathieson, 2008) Regulated (Prokasky et al., 2017)
Inhibited/Unregulated	Average to low surgency, high reactivity, low regulation	Cautious/slow to warm up (McClowry, 2002) Uneasy (Janson & Mathieson, 2008) Reactive/inhibited (Sanson et al. 2009) High reactive (Prokasky et al., 2017)
Average/Typical	Approx. average surgency, reactivity, and regulation	Unremarkable (Janson & Mathieson, 2008) Average (Prokasky et al., 2017) Well-adjusted (Prokasky et al., 2017) Typical (Hawes et al., 2022)

There are, of course, broad limitations within existing research that deserve to be mentioned, particularly regarding the generalizability of findings and the stability of the profiles over time. Although research connecting temperament profiles to childhood outcomes imply some kind of stability in observed profiles, many of the studies are not longitudinal. However, the few studies that do have multiple time points (Komsi et al., 2006; Janson & Mathiesen, 2008; Sanson et al., 2009; Laible et al., 2014), have contributed to the conclusion that temperament profiles maintain significant stability. This finding is important, as statistical stability is essential for determining the value of person-centered research in relation to behavior outcomes later in childhood. It is also crucial to remember that temperament profiles are simplifications of much

larger datasets and are a representation of more complicated combinations of temperament dimensions (Martin et al., 2020). Any child within a given profile will deviate to some degree from the average score of that specific profile. Although children within the same profile are similar, they are not the same. In addition, a profile is only contingent on one sample of children defined by whatever measure the researchers choose to use. Thus, there is no one true model that captures the elements of early-childhood temperament in its entirety. That is why further research is needed; not to find the optimal profile-based solution, but to contribute to a better understanding of the role of temperament in a number of diverse outcomes.

The Current Profile-Based Solution

The present study aimed to contextualize temperament profiles formerly generated from the current dataset within the broader anthology of profile-based research. The present dataset was previously analyzed by Waldrip (2023), who sought to create early-childhood temperament profiles that comprised reactive and regulatory dimensions of temperament and represented both parent and teacher perspectives of children's individual differences. Similar to the ambitions of Prokasky et al. (2017), Waldrip aimed to assess more fine-tuned dimensions of temperament. From adapted Short Forms of the Children's Behavior Questionnaire, (CBQ-SF; Putnam & Rothbart, 2006; CBQ-TSF; Teglasi et al., 2015), Waldrip selected temperament variables that would theoretically and statistically fit the creation of the sample's profiles. The final variables that were selected for latent profile analysis were as follows: exuberance (activity, approach, high intensity pleasure, and shyness), positive affect, internalizing emotion (fear and sadness), anger, emotion regulation, behavior regulation (attentional focusing and inhibitory control), low intensity pleasure, and perceptual sensitivity. Waldrip first generated parent and teacher-rated profiles from variables of reactivity and then repeated the analytic procedure with the inclusion

of both reactive and regulatory variables (see Appendix A). Waldrip also developed descriptive shorthand labels for each established profile in order to simplify discussion and comparison of results (see Table 3). However, several of Waldrip's identified profiles did not fit neatly into descriptive shorthand labels, which likely obscured the salience of certain fine-tuned temperament characteristics in each established profile solution (see Table 4 and Table 5). Therefore, in order to preserve the complexity previously captured by Waldrip (2023), the current study utilizes the descriptive characteristics of each established temperament profile to communicate subtle differences within parent and teacher profile solutions on a number of social and behavioral outcomes. The following visuals illustrate the temperament characteristics that distinguish each temperament profile (see Table 4 and Table 5). For each established profile, profile descriptions reflect the extent to which each group's temperament characteristics depart from the sample mean. The order in which temperament characteristics are listed within each profile description is determined by how greatly such characteristics deviate from the sample mean, with extreme differences listed first. To easily convey the level of departure from the sample mean, a descriptive convention was developed in which 'low' and 'high' descriptors denote variables for which profile means are more than one standard deviation away from the sample mean and 'moderately high' and 'moderately low' descriptors denote variables for which profile means are between one half and one standard deviation away from the sample mean. Variables that are not included in profile descriptions should be presumed to be average. In using profile characterizations that express the nuance of Waldrip's (2023) temperament profiles, differences between certain temperament characteristics and psychosocial outcome variables can be better explained in light of aforementioned theory.

Table 3

Waldrip's Approach to Naming Profiles of Reactivity and Regulation

Profile Label	Description
High Reactive	Elevated levels across most or all variables of exuberance, positive emotional reactivity, and negative emotional reactivity
Average Reactive	Average levels across most or all variables of exuberance, positive emotional reactivity, and negative emotional reactivity
Low Reactive	Decreased levels across most or all variables of exuberance, positive emotional reactivity, and negative emotional reactivity
Exuberant	Elevated levels of exuberance
Reserved	Decreased levels of exuberance
Inhibited	Reserved, but with elevated levels of internalizing emotion
Positively Emotionally Reactive	Elevated levels of positive affectivity
Negatively Emotionally Reactive	Elevated levels of both anger and internalizing emotion
Prone to (Anger, Internalizing Emotion)	Elevated levels in one variable of negative emotional reactivity
Well-Regulated	Consistently elevated levels across both variables of regulation
Regulated	At least average levels across both variables of regulation, with elevated levels for up to one variable
Dysregulated	Decreased levels of both variables of regulation
Highly Attuned to Subtlety	Elevated levels of one or both variables of information processing
Under Attuned to Subtlety	Decreased levels of one or both variables of information processing

Note. Adapted with permission from *Understanding parent and teacher perspectives of temperament profiles in young children* by S. Waldrip, 2023, [Doctoral dissertation, University of Maryland, College Park]. ProQuest Dissertations and Theses Global, p. 48.

Table 4

Misalignment of Waldrip's Original Labels with Descriptions of Parent-Rated Temperament Profiles

Original Profile Label	N	Description	Label / Description Misalignment
Under Attuned to Subtlety and Dysregulated	17	Low perceptual sensitivity; moderately low levels of low intensity pleasure, moderately low internalizing emotion, and moderately low emotion regulation (*soothability*)	Slight misalignment; *average behavioral regulation* (attentional focusing and inhibitory control) incongruent with 'dysregulated' label
Negatively Emotionally Reactive and Dysregulated	13	Low positive affect, low levels of low intensity pleasure, low behavior regulation (*attentional focusing and inhibitory control*), and low emotion regulation; moderately high internalizing emotion (*fear and sadness*); moderately low perceptual sensitivity; moderately high anger	Moderate misalignment; *low positive affect* and *low intensity pleasure* unaccounted for in original label; no specification of the extent of trait divergence (*moderately high negative affectivity*)
Exuberant and Regulated	3	Low positive affect, low internalizing emotion, and low anger; moderately high emotion regulation and moderately high exuberance	Strong misalignment; *low positive affect* and l*ow negative affectivity* unaccounted for in original label, *average behavioral regulation* (attentional focusing and inhibitory control) incongruent with 'regulated' label
Reserved and Regulated	21	Low exuberance (*activity, approach, high intensity pleasure, rev. shyness)* and low positive affect	Moderate misalignment; *average behavioral regulation* (attentional focusing and inhibitory control) and *emotional regulation* (soothability) incongruent with 'regulated' label
Exuberant and Dysregulated	38	Moderately high exuberance, moderately high positive affect, and moderately high anger; moderately low behavior regulation	Slight misalignment; no specification of the extent of trait divergence (*moderately high exuberance* and *moderately low behavior regulation*)
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated	41	Moderately high emotion regulation, moderately high behavior regulation, and moderately high levels of low intensity pleasure; moderately low anger; moderately high positive affect	Moderate misalignment; no specification of the extent of trait divergence (moderately high regulation and positive affect); *average perceptual sensitivity* incongruent with 'highly attuned to subtlety' label

Table 5

Misalignment of Waldrip's (2023) Original Labels with Descriptions of Teacher-Rated Temperament Profiles

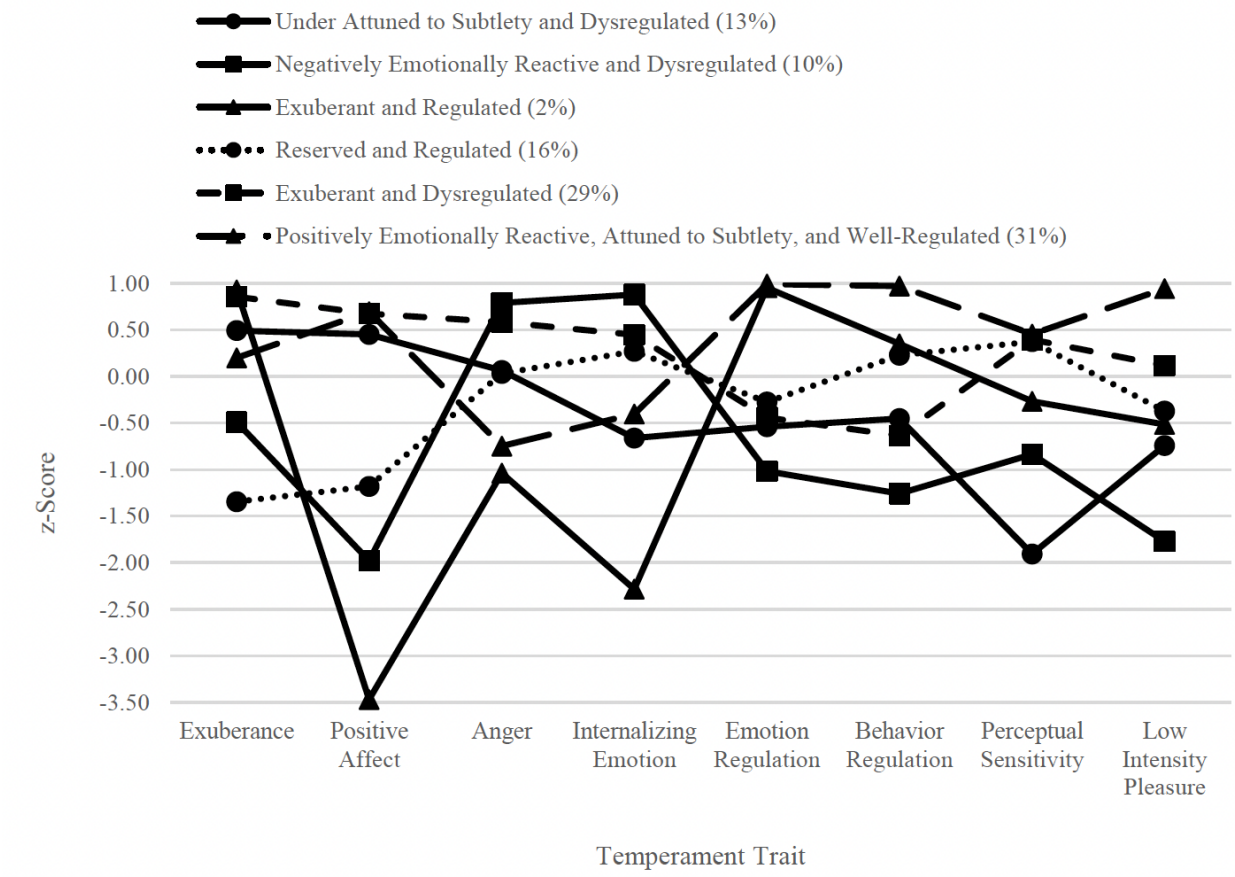
Original Profile Label	N	Description	Label / Description Misalignment
Exuberant and Dysregulated	5	Low behavior regulation (*attentional focusing and inhibitory contro*l) and low levels of low intensity pleasure; high exuberance; moderately low internalizing emotion and moderately low emotion regulation (*soothability*); moderately high positive affect; moderately low perceptual sensitivity	No misalignment
Reserved and Regulated	11	Low positive affect and low exuberance (*activity, approach, high intensity pleasure, rev. shyness)*	Moderate misalignment; *average behavioral regulation* (attentional focusing and inhibitory control) and *emotional regulation* (soothability) incongruent with 'regulated' label
Low to Average Reactive and Regulated	49	Moderately low exuberance; moderately high behavior regulation	Slight misalignment; *moderately low exuberance* unaccounted for/unspecified in original label
Exuberant and Regulated	31	Low internalizing emotion (*fear and sadness*); moderately high exuberance and moderately high positive affect; moderately low levels of low intensity pleasure; moderately high emotion regulation	Strong misalignment; *low internalizing emotion* unaccounted for in original label, *average behavioral regulation* (attentional focusing and inhibitory control) incongruent with 'regulated' label, no specification of the extent of trait divergence (*moderately high exuberance, emotion regulation, positive affect*)
Negative Emotionally Reactive but Regulated	22	Moderately high levels of internalizing emotion and anger	Moderate misalignment; *average behavioral regulation* (attentional focusing and inhibitory control) and *emotional regulation* (soothability) incongruent with 'regulated' label, no specification of the extent of trait divergence (*moderately high exuberance, emotion regulation, positive affect*)
Negatively Emotionally Reactive and Dysregulated	12	Low levels of emotion regulation; high levels of anger and internalizing emotion; moderately low levels of behavior regulation and positive affect	No misalignment
High Reactive and Dysregulated	3	Low emotion regulation; high anger, high exuberance, and high positive affect; low behavior regulation; moderately low levels of perceptual sensitivity and low intensity pleasure	Slight misalignment; *high exuberance* unaccounted for in original label, no specification of type of reactivity (*average internalizing emotion*)

Parent – Reported Profile Solution

A six-profile solution was identified by Waldrip (2023) as the best solution for parent-reported temperament (see Figure 1 and Table 6). The first profile, categorized as 'Under Attuned to Subtlety and Dysregulated', comprised 13% of the sample and was characterized by low perceptual sensitivity and moderately low levels of internalizing emotion, emotion regulation, and low intensity pleasure. The next cluster, described as 'Negative Emotionally Reactive and Dysregulated', made up 10% of the sample and exhibited moderately high internalizing emotion, low levels of positive affect, emotion regulation, behavior regulation, and low intensity pleasure, and moderately low perceptual sensitivity. Children who were characterized by moderately high levels of exuberance and emotion regulation and low levels of positive affect, anger, and internalizing emotion were labeled as 'Exuberant and Regulated'. This cluster only comprised 2% of the sample. The fourth profile, categorized as 'Reserved and Regulated', comprised 16% of the sample and was characterized by low levels of exuberance and positive affect, but otherwise average ratings. Next, 'Exuberant and Dysregulated' children made up 29% of the sample and were characterized by moderately high levels of exuberance, positive affect, and anger and moderately low levels of behavior regulation. The last profile was described as 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated'. This cluster of children comprised 31% of the sample and consisted of children who exhibited moderately high levels of emotion regulation, behavior regulation, positive affect, and low intensity pleasure and moderately low anger.

Figure 1

Six-Profile Solution of Parent-Rated Temperament



Note. Reprinted with permission from *Understanding parent and teacher perspectives of temperament profiles in young children* by S. Waldrip, 2023, [Doctoral dissertation, University of Maryland, College Park]. ProQuest Dissertations and Theses Global, p. 52.

Table 6

Parent-Reported Solution of Reactivity and Regulation

	Mean	0.5 SD	0.5 SD Range	1 SD	1 SD Range	1[a] (17)	2[b] (13)	3[c] (3)	4[d] (21)	5[e] (38)	6[f] (41)
Exuberance	4.63	0.27	4.36 – 4.90	0.55	4.08 – 5.18	4.90	4.36	*5.14*	**3.89**	*5.10*	4.74
Positive Affect	5.99	0.25	5.74 – 6.24	0.49	5.50 – 6.48	6.21	**5.02**	**4.29**	**5.41**	*6.32*	*6.33*
Anger	4.16	0.64	3.52 – 4.80	1.27	2.89 – 5.43	4.24	*5.16*	**2.84**	4.20	*4.90*	*3.21*
Internalizing Emotion	4.11	0.37	3.74 – 4.48	0.74	3.37 – 4.85	*3.62*	*4.76*	**2.42**	4.31	4.44	3.81
Emotion Regulation	4.80	0.51	4.29 – 5.31	1.02	3.78 – 5.82	*4.25*	**3.76**	*5.77*	4.52	4.35	*5.81*
Behavior Regulation	5.02	0.33	4.69 – 5.35	0.66	4.36 – 5.68	4.72	**4.19**	5.25	5.17	*4.60*	*5.66*
Perceptual Sensitivity	5.34	0.43	4.91 – 5.77	0.86	4.48 – 6.20	**3.70**	*4.62*	5.11	5.66	5.68	5.73
Low Intensity Pleasure	5.81	0.18	5.63 – 5.99	0.35	5.46 – 6.16	*5.55*	**5.19**	5.63	5.68	5.85	*6.14*

Note. Dark shading denotes scores significantly greater than the sample mean. Light grey shading denotes scores significantly below the sample mean. Italic font denotes scores greater or less than 0.5 standard deviation from the sample mean. Bold font denotes scores greater or less than one standard deviation from the sample mean. Adapted with permission from *Understanding parent and teacher perspectives of temperament profiles in young children* by S. Waldrip, 2023, [Doctoral dissertation, University of Maryland, College Park]. ProQuest Dissertations and Theses Global, p. 97.

[a] Under Attuned to Subtlety and Dysregulated

[b] Negatively Emotionally Reactive and Dysregulated

[c] Exuberant and Regulated

[d] Reserved and Regulated

[e] Exuberant and Dysregulated

[f] Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated

Teacher – Reported Profile Solution

For teacher-reported temperament, a seven-profile solution was deemed by Waldrip (2023) to be the best solution (see Figure 2 and Table 7). The first cluster, which only comprised 4% of the sample, was described as 'Exuberant and Dysregulated' and was characterized by high exuberance, moderately high positive affect, low levels of behavior regulation and low intensity pleasure, and moderately low levels of emotion regulation, internalizing emotion, and perceptual sensitivity. The next profile made up 8% of the sample and consisted of children who displayed low levels of exuberance and positive affect, but otherwise average ratings. This group was labeled as 'Reserved and Regulated'. Children who exhibited moderately low exuberance, moderately high behavior regulation, and otherwise average ratings comprised 37% of the sample and were categorized as 'Low to Average Reactive and Regulated'. Next, children described as 'Exuberant and Regulated' comprised 23% of the sample and were characterized by moderately high levels of exuberance, positive affect, and emotion regulation, low internalizing emotion, and moderately low levels of perceptual sensitivity and low intensity pleasure. The fifth profile, 'Negatively Emotionally Reactive but Regulated', made up 17% of the sample. Children in this group displayed moderately high levels of anger and internalizing emotion, but otherwise average ratings. The next profile, 'Negatively Emotionally Reactive and Dysregulated' comprised 9% of the sample and was characterized by high levels of anger and internalizing emotion, low emotion regulation, and moderately low levels of behavior regulation and positive affect. Lastly, 'High Reactive and Dysregulated' children made up 2% of the sample and exhibited high levels of exuberance, positive affect, and anger, low levels of emotion regulation and behavior regulation, and moderately low levels of perceptual sensitivity and low intensity pleasure.

Figure 2

Seven-Profile Solution of Teacher-Rated Temperament

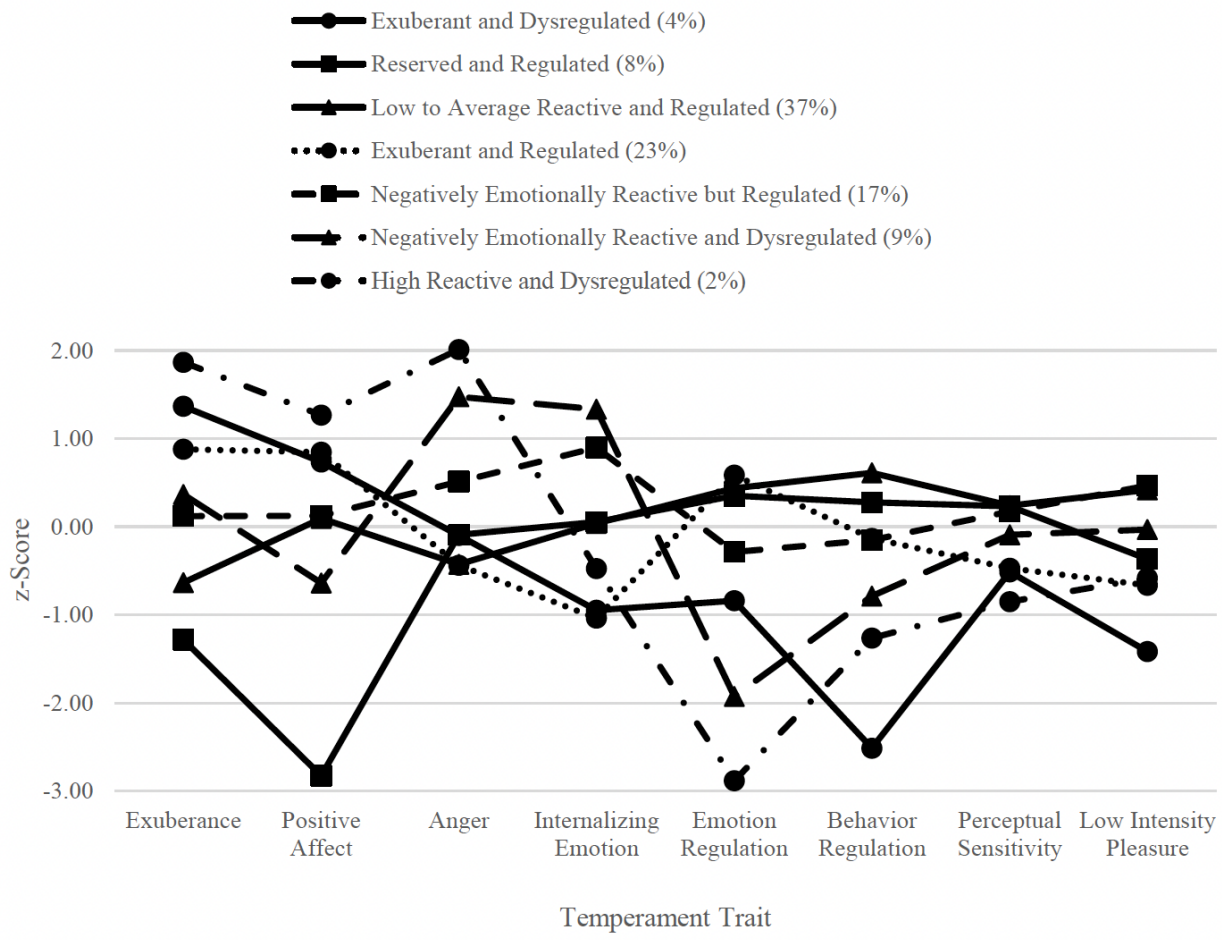


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Table 7

Teacher-Reported Solution of Reactivity and Regulation

	Mean	0.5 SD	0.5 SD Range	1 SD	1 SD Range	1[a] (5)	2[b] (11)	3[c] (49)	4[d] (31)	5[e] (22)	6[f] (12)	7[g] (3)
Exuberance	4.58	0.37	4.21 – 4.95	0.74	3.84 – 5.32	**5.59**	**3.63**	*4.11*	*5.23*	4.67	4.85	**5.96**
Positive Affect	5.63	0.32	5.31 – 5.95	0.64	4.99 – 6.27	*6.10*	**3.82**	5.69	*6.17*	5.71	*5.22*	**6.44**
Anger	2.58	0.86	1.72 – 3.44	1.71	0.87 – 4.29	2.41	2.42	1.85	1.83	*3.45*	**5.10**	**6.02**
Internalizing Emotion	2.81	0.39	2.42 – 3.20	0.78	2.03 – 3.59	*2.07*	2.85	2.84	**2.00**	*3.51*	**3.85**	2.44
Emotion Regulation	4.97	0.47	4.50 – 5.44	0.94	4.03 – 5.91	*4.18*	5.30	5.38	*5.52*	4.70	**3.16**	**2.26**
Behavior Regulation	4.91	0.57	4.34 – 5.48	1.13	3.78 – 6.04	**2.07**	5.22	*5.60*	4.76	4.74	*4.02*	**3.48**
Perceptual Sensitivity	4.56	0.61	3.95 – 5.17	1.21	3.35 – 5.77	*3.94*	4.84	4.85	3.99	4.77	4.45	*3.53*
Low Intensity Pleasure	4.93	0.30	4.63 – 5.23	0.60	4.33 – 5.53	**4.08**	4.71	5.18	*4.53*	5.21	4.91	*4.58*

Note. Dark shading denotes scores significantly greater than the sample mean. Light grey shading denotes scores significantly below the sample mean. Italic font denotes scores greater or less than 0.5 standard deviation from the sample mean. Bold font denotes scores greater or less than one standard deviation from the sample mean. Adapted with permission from *Understanding parent and teacher perspectives of temperament profiles in young children* by S. Waldrip, 2023, [Doctoral dissertation, University of Maryland, College Park]. ProQuest Dissertations and Theses Global, p. 108.

[a] Exuberant and Dysregulated

[b] Reserved and Regulated

[c] Low to Average Reactive and Regulated

[d] Exuberant and Regulated

[e] Negatively Emotionally Reactive but Regulated

[f] Negatively Emotionally Reactive and Dysregulated

[g] High Reactive and Dysregulated

Contextualization of Parent and Teacher-Reported Profiles

Waldrip (2023) found that her profiles generally reflected subdivisions of traditional reactivity profiles found within the literature, but with varying degrees of regulation. According to Waldrip, the 'Under Attuned to Subtlety and Dysregulated' and 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' profiles, generated by parent-reported temperament, were similar to traditional low/average reactive profiles. Additionally, the teacher-rated 'Low to Average Reactive and Regulated' profile resembled a low/average reactive type. 'Exuberant and Regulated' and 'Exuberant and Dysregulated' profiles, which were identified in both parent and teacher-rated solutions, resembled the traditional exuberant profile. The 'High Reactive and Dysregulated' profile, exclusive to the teacher-rated solution, was also similar to the traditional exuberant type. Lastly, the 'Reserved and Regulated' and 'Negatively Emotionally Reactive and Dysregulated' profiles, which appeared in both parent-rated and teacher-rated profile solutions, reflected the traditional inhibited profile. The 'Negatively Emotionally Reactive but Regulated' profile, found using teacher ratings, also resembled the traditional inhibited profile.

When weighed against themes found within extant research on profiles of reactivity *and* regulation, five traditional temperament profiles can be observed (see Table 8). The traditional exuberant/regulated profile mirrors that of Waldrip's 'Exuberant and Regulated' profile, but only when reported by teachers. Waldrip found that parent-rated 'Exuberant and Regulated' children exhibited low levels of affectivity, even in relation to positive affectivity, which appeared to be unlike any existing profile type and was likely clinically significant. The established exuberant/unregulated temperament style is replicated by 'Exuberant and Dysregulated' profiles found in both parent-rated and teacher-rated profiles. However, there appears to be significant

differences between children labeled as ‘Exuberant and Dysregulated’ by teachers, such that these ‘Exuberant and Dysregulated’ children display extremes of both behavioral dysregulation and exuberance. For instance, parent-rated ‘Exuberant and Dysregulated’ children populate approximately 29% of the sample, whereas teacher-rated ‘exuberant and dysregulated’ make up only 4% of the sample. Thus, the teacher-rated ‘Exuberant and Dysregulated’ type may indicate more severe adaptive issues when compared to the parent-rated ‘Exuberant and Dysregulated’ type and may not be representative of the traditional profile type. Finally, the traditional inhibited/regulated type is reflected by Waldrip’s (2023) ‘Reserved and Regulated’ types found among both parent and teacher profiles. A few of Waldrip’s other profiles mirror previously established profiles, though these are not as commonly identified in the literature. The traditional average/typical type is mostly reflected by the ‘Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated’ profile found using parent ratings and the ‘Low to Average Reactive and Regulated’ and ‘Negatively Emotionally Reactive but Regulated’ profiles identified by teachers. In addition, ‘Negatively Emotionally Reactive and Dysregulated’ profiles, which were found in both parent and teacher profile solutions, seem comparable to the traditional inhibited/unregulated profile found in the extant literature. Additionally, Waldrip’s teacher-rated temperament profiles revealed a ‘High Reactive and Dysregulated’ type that demonstrated both high positive affect and high anger, as well as extreme emotional dysregulation. Like parent-rated ‘Exuberant and Regulated’ children, this profile seems to be clinically significant and difficult to compare to any existing profile-based solution, though Laible et al.’s (2014) ‘very low regulation and high anger emotionality’ most closely relates. Lastly, the ‘Under Attuned to Subtlety and Dysregulated’ profile, identified by parent ratings alone, was unlike any other profile previously established in the literature. Given the sizeable prevalence of this temperament

type (13%), further examination of the profile and its distinguishing features of low perceptual sensitivity and low intensity pleasure are warranted.

Table 8

Empirical Contextualization of Profiles by Informant

Common Profile Type	Parent-Rated Profiles	Teacher-Rated Profiles
Exuberant/Regulated	-	Exuberant and Regulated (23%)
Exuberant/Unregulated	Exuberant and Dysregulated (29%)	-
Inhibited/Regulated	Reserved and Regulated (16%)	Reserved and Regulated (8%)
Inhibited/Unregulated	Negatively Emotionally Reactive and Dysregulated (10%)	Negatively Emotionally Reactive and Dysregulated (9%)
Average/Typical	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated (31%)	Low to Average Reactive and Regulated (37%) Negatively Emotionally Reactive but Regulated (17%)
N/A	Exuberant and Regulated (2%)	Exuberant and Dysregulated (4%)
	Under Attuned to Subtlety and Dysregulated (13%)	High Reactive and Dysregulated (2%)

Note. Percentages reflect the proportion of the sample characterized by each profile.

Waldrip (2023) also noted that while parent and teacher profiles shared similarities, they also contained unique qualities that were challenging to compare. Each solution appeared to yield a similar number of profiles, with parent ratings generating six profiles and teacher ratings generating seven profiles. However, even when profiles were comparably named, different

children populated such profiles across informants. Several profile patterns were correspondent across informant ratings, including ‘Exuberant and Regulated’, ‘Exuberant and Dysregulated’, ‘Reserved and Regulated’, and ‘Negatively Emotionally Reactive and Dysregulated’ profiles. However, while a couple of profiles bore the same name in both parent-rated and teacher-rated solutions, they displayed significant differences. For instance, ‘Exuberant and Dysregulated’ children identified by parents represented a sizeable portion of children (29%) and exhibited only moderately high levels of exuberance and moderately low levels of behavior regulation, whereas ‘Exuberant and Dysregulated’ children identified by teachers made up a very small portion of the sample (4%) and described behavior marked by very high exuberance and very low behavior regulation. Teacher-rated ‘Exuberant and Dysregulated’ children also displayed moderately low levels of emotion regulation, internalizing emotion, and perceptual sensitivity, which was not reflected by parent ratings of this profile type. Additionally, ‘Exuberant and Regulated’ profiles, while similarly named, exhibited dissimilarities across informant ratings. Parent-rated ‘Exuberant and Regulated’ children (2%) were marked by moderately high exuberance and a general lack of emotional reactivity (low positive affect, anger, and internalizing emotion), whereas teacher-rated ‘Exuberant and Regulated’ children (23%) were mostly characterized by moderately high levels of exuberance and low internalizing emotion. In addition to the aforementioned differences, some profiles were also exclusive to either informant, including the ‘Under Attuned to Subtlety and Dysregulated’ and ‘Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated’ profiles found using parent ratings and the ‘Low to Average Reactive and Regulated’, ‘High Reactive and Dysregulated’, and ‘Negatively Emotionally Reactive and Regulated’ profiles found using teacher ratings. Waldrip (2023) specifically highlighted differences in the perception of exuberance by parents and teachers,

noting that exuberant children were more likely to be rated as regulated by teachers and dysregulated by parents. Parents also seemed to be more attuned to children's overall regulatory capacities when children exhibited low to average reactivity, as evidenced by greater variability in self-regulation of such children. Teacher ratings only generated one low to average reactivity and regulation profile ('Low to Average Reactive and Regulated'), whereas parent ratings resulted in one low to average reactive profile with poor regulation ('Under Attuned to Subtlety and Dysregulated') and one with stronger self-regulation ('positively emotionally reactive, highly attuned to subtlety, and well-regulated').

Taken as a whole, the similarities identified among Waldrip's (2023) teacher-rated and parent-rated profiles of child temperament verify the salience of previously identified themes, despite differences in situational context. Similarly, the distinctions found between the aforementioned teacher-rated and parent-rated profiles endorse the value of a multiple-informant design in reflecting the unique demands of each environment. Waldrip's study was one of the first to consider both reactive and regulatory tendencies in the development of early-childhood temperament profiles, especially by accounting for both parent and teacher perspective and by using more modern statistical techniques. The complexity of her findings warrants additional investigation of the implication of such profiles in the development of certain social and behavioral outcomes.

Profiles of Child Temperament in Relation to Social Development

Increased interest in the investigation of temperament has led to an assertion that temperament plays a central role in children's social development. While many studies have examined concurrent and longitudinal associations between specific temperament dimensions and children's psychosocial adjustment, few have explored the developmental influence of unique temperament *profiles*. Additionally, many different processes have been used to describe the relationship between children's temperament and adjustment, with some researchers insinuating direct linear effects and others proposing mediating or moderating processes in consideration with other environmental factors (i.e. parenting) (Sanson et al., 2004). The bulk of temperament-related research has interpreted temperament as directly related to the development of internalizing behavior problems, externalizing behavior problems, and social competency skills.

A range of temperamental characteristics have been documented as predictors of internalizing and externalizing problem behaviors. Negative emotionality, in particular, is frequently linked to *both* externalizing and internalizing problems in the extant literature (Sanson et al., 2004; Gartstein et al., 2016). However, many scholars consider the sole predictive value of negative emotionality insufficient in explaining the development of complex behavior problems. For instance, Rothbart and Bates (2006) suggest that self-regulatory capacities moderate the impact of negative emotionality, such that children high on negative emotionality exhibit less maladaptive behavior if they possess the ability to inhibit negative emotional reactions and focus attention on meeting situational demands. Attention regulation abilities appear to be of key importance in mitigating the development of behavior problems, especially for children already predisposed to high levels of emotional reactivity. Eisenberg et al. (2000) found that while low

behavioral regulation predicted externalizing behavior problems for all children, low attentional control specifically predicted externalizing behavior problems for *only* children high in negative emotionality. Attentional regulation has also been considered protective for children who are high in inhibitory control (White et al., 2011) or high in perceptual sensitivity (Frenkel et al., 2009); characteristics that are otherwise connected to increased risk for internalizing behavior problems. However, empirical investigation of individual differences in perceptual sensitivity *alone* has been mixed, suggesting that stronger emotional regulatory skills mitigate the impact of high perceptual sensitivity on internalizing problem behaviors (Evans et al., 2012). For instance, children high in perceptual sensitivity may be more adept at appraising threat in the environment, and given appropriate regulatory abilities, may be able to promptly modulate their emotional responses (Pollak et al., 2009). Conversely, children who display lower perceptual sensitivity may be less skilled at detecting internal or external cues, making it more difficult to emotionally regulate after a particularly intense anxiety-provoking event. Thus, associations between perceptual sensitivity and internalizing behavior suggest a more complex relationship maintained by emotional regulation. High activity, though not as notable, is also associated with the development of behavior problems in childhood (Janson & Mathiesen, 2008). In fact, Hagekull (1994) found that negative emotionality, low self-regulation, and high activity jointly predicted 4-year-olds' externalizing problems. Altogether, extensive evidence explains associations between the aforementioned temperament characteristics and problem behaviors in early childhood. High activity, negative emotionality, and poor self-regulation are typically connected to externalizing behavior concerns, whereas perceptual sensitivity, inhibition, and negative emotionality are commonly related to internalizing behavior concerns.

Similarly, a few distinct characteristics of temperament are connected to social competence and prosocial behavior in early childhood. Previous research on temperament's contribution to social functioning have identified negative emotionality and self-regulation as influential factors in the development of prosocial behavior. In the aforementioned study performed by Eisenberg and colleagues (2000), children who were both highly emotional and poorly regulated had the lowest parent, teacher, and observer-rated levels of social competency. Additionally, existing literature suggests that the impact of negative emotionality on social functioning could be disaggregated to distinguish differences in prosocial behavior based on types of negative emotion. For example, children who are especially prone to high levels of anger tend to display increased risk of aggression and subsequent lack of empathy and rejection from peers (Strayer & Roberts, 2004). Though, recent research on the influence of anger on social development suggests that anger may actually promote greater attention to goals and decision making in situations that involve challenges or barriers to goal attainment (Khan et al., 2019; Lench et al., 2023). Depending on how anger is measured by researchers and subsequently interpreted by informants, elevated levels of anger may simultaneously reflect greater self-directed behavior. For example, anger/frustration, as defined by the Children's Behavior Questionnaire (CBQ; Rothbart et al., 2001) concerns the amount of negative affect related to the interruption of tasks or goal-blocking. Conversely, internalizing emotions, such as temperamental sadness and fear, are much more underrepresented in temperament-related research on social skill development. Eisenberg et al. (2006) speculate that sadness and fear promote greater guilt and empathy, which successively predict prosocial behavior but may also disrupt other types of social behavior (i.e. assertion). However, no direct link between temperamental dimensions of internalizing emotion and social functioning have been observed.

A small, yet growing, number of studies have also focused on the impact of perceptual sensitivity on prosocial behavior. Perceptual sensitivity reflects an individual's awareness to subtle environmental stimuli, which includes attunement to others' social-emotional cues (Evans et al., 2012). Children who exhibit high perceptual sensitivity may be able to notice more internal and external cues during social interactions, and with strong self-regulatory ability, may use these cues to emotionally regulate (i.e. peer nodding and smiling) or to help others (i.e. peer discomfort). Though, without self-regulation skills, children high in perceptual sensitivity may become easily overwhelmed by environmental stimuli and may find it more challenging to perceive the needs and social expectations of others. While there is limited research on this topic, perceptual sensitivity, negative emotionality, and self-regulation are generally recognized as predictors of children's social functioning.

Given the significance of the previously discussed variable-centric relationships, it is useful to identify patterns in current person-centered research to fully understand the relation of temperament and social functioning for particular individuals. There is mounting evidence to support an association between certain temperamental profiles and psychosocial adjustment in early childhood (Dollar et al., 2017). Most person-centered models associated with social-developmental outcomes tend to support the finding that children who fall within exuberant or undercontrolled temperament typology exhibit higher externalizing behaviors, whereas children classified into inhibited or overcontrolled temperament types display higher internalizing behaviors (Van den Akker, 2010). Distinct patterns regarding social competency and prosocial behavior are less established, but existing research suggests that any profile marked by behavioral dysregulation and/or negative emotionality predicts poorer social skills (Laible et al.,

2014). A few of the aforementioned researchers have successfully identified similar outcomes in their own person-centered models.

Aksan et al. (1999) found that non-controlled-expressive children, characterized by high approach, high negative emotionality, and low behavioral control, were higher in concurrently assessed parent-rated problem behaviors at both 3 years of age and 4 years of age. Janson and Mathiesen (2008) found similar results in their analysis of temperament profiles and parent-reported behavior problems at each wave of their longitudinal investigation (18 months, 30 months, 4–5 years, and 8–9 years old). The level of externalizing problems in their undercontrolled profile, which was characterized by high activity, emotionality, and sociability, was significantly higher than in the remaining three profiles (uneasy, inhibited, confident). Their uneasy profile, which was described by high shyness and emotionality, also had a somewhat higher level of externalizing problems. Conversely, inhibited and uneasy children exhibited greater internalizing problems. Janson and Mathieson's (2008) results mostly replicated previous findings that suggested that high emotionality and activity predicted concurrent behavior problems. However, Jason and Mathieson's confident profile, which displayed the highest levels of activity, did not exhibit significant behavior problems. This finding emphasizes the importance of person-centered research, implying that activity may only be associated with behavior problems in the presence of emotionality or other dimensions of temperament (i.e. sociability).

Sanson et. al (2009) identified profiles of toddlers, which were then utilized to explore implications for parent and teacher-reported social and behavioral adjustment at 7-8 years old. According to parent-report, children in the reactive/inhibited (high reactivity, high inhibition, moderately low regulation) and poor attention regulation (low attention regulation, moderately

high reactivity, moderately low inhibition) profile types were at risk for more internalizing and externalizing behavior problems and displayed poorer social competence compared to children in the nonreactive/outgoing (low inhibition, moderately high regulation, low reactivity) and high attention regulation (high attention regulation, moderately high inhibition, moderately low reactivity) groups. Sanson and colleagues also emphasized that children in the nonreactive/outgoing cluster had significantly better social skills in late childhood than children in any of the other clusters. According to teacher-report, children in the poor attention regulation profile had lower social competence and were more aggressive and hyperactive compared with children in other clusters. Sanson and colleagues also noted that a lack of significant findings for internalizing problems regarding teacher-reported data was expected given the difficulty of observing and addressing these problems in a classroom setting. Overall, children in the poor attention regulation group were at greater risk of externalizing problems, internalizing problems (by parent report only), and exhibited poorer social skills. Children in the poor attention regulation group were also especially at risk of developing hyperactivity and attention problems. On the other hand, reactive/inhibited children were at greater risk of poorer social skills and *both* internalizing problems and externalizing problems.

Laible et al. (2014) also explored the impact of children's temperament profiles in an educational context, focusing specifically on concurrent and longitudinal behavioral data collected when children were 4 years old, 7 years old, and 9 years old. Laible and colleagues found that children who were low in negative emotionality and high in self-regulation were rated by teachers and parents as being the most socially cooperative. Conversely, children who were low in regulation but high in negative emotionality were rated as low in prosocial and cooperative behavior, especially if the children were identified as anger prone. Children

moderately high in negative emotionality but also moderately high in self-regulation showed very low risk for social behavioral problems, supporting previous arguments that high levels of negative emotionality negatively impact children's social development, but only if accompanied by a lack of self-regulation (Eisenberg et al., 2006).

Although the previously discussed studies provide support for a direct relationship between early-childhood temperament, behavioral problems, and social functioning, there are very few studies that use profile-based methodology to demonstrate such relationships. Further person-centered research is needed to explicate the relationship between temperament and social development within the context of the "whole person." Additionally, the research reviewed thus far has mostly investigated broad social developmental outcomes with little consideration for the context of such behavior. Few studies have accounted for the influence of temperament on adjustment across multiple contexts, such as in relationships with parents (Van den Akker, 2010), in friendships with peers (Laible et al., 2014), or in a structured classroom environment (Sanson et al., 2009). Studies such as these provide additional insight into how temperament operates in a broader social context, beyond that of constrained main effects. For instance, the fit between children's temperament and the demands of the school environment appears to be especially instrumental in social development. Sanson et al.'s (2004) review of literature on processes of temperament and social development suggest that structured and routine-oriented classrooms help children with lower sociability and attention regulation in developing more social confidence, whereas less structured classroom settings appear to be mostly beneficial for children who are already socially competent and well-regulated. Given this notion, it can be asserted that children's social adjustment is influenced by much more than temperament style itself but by the congruence between a child's temperament characteristics and context-specific

expectations. Thus, not only is further person-centered research needed to more accurately describe temperament's influence on social development, but research that includes multiple informant sources and modes of assessment is also warranted. Further examination of such nuances may ultimately assist those who work with children in better accommodating children's individual differences.

The Current Study

The current study extends the work of Waldrip (2023), who used person-centered methodology to identify temperament profiles of young children from distinct perspectives of parents and teachers. As such, the primary purpose of the current study is to contextualize Waldrip's temperament profiles within the broader anthology of profile-based research and to relate such profiles to children's social development. The extant literature on children's social development suggests an interactive relationship between temperamental processes of reactivity and regulation on social-developmental outcomes like social functioning and problem behavior (see Sanson et al., 2004 for review). However, such patterns were found using variable-centric methodology that likely obscures complexities in how various temperamental characteristics interact in their association with social behavior. Therefore, the present study employs person-centered methodology to examine whether children with different constellations of temperament characteristics differ on ratings of behavior problems and social skills as reported by parents and teachers. Overall, the current study accounts for the complexity of children's temperament to more accurately relate temperament to the development of social behavior in early-childhood, subsequently informing social-emotional services and supports for various types of children. Temperament profile membership and social behavior were analyzed separately for both teacher and parent perspectives, and comparisons of social-developmental outcomes were examined for

profiles that comprised more than 5% of the sample. Profiles that comprised more than 5% of the sample were rank ordered based on the likelihood of displaying greater internalizing problem behaviors, externalizing problem behaviors, and social skills. Concurrent with themes found in existing research, the following hypotheses and questions were developed (see Table 9 – 14 and Appendix B). It should be noted, however, that initial predictions were largely influenced by a naming convention associated with Waldrip's (2023) established temperament profiles. As previously mentioned, original profile classifications likely obscured the salience of certain fine-tuned temperament characteristics in each identified profile (see Table 4 and Table 5). Upon further investigation of the complete characterization of selected profiles, initial predictions were reordered and juxtaposed with adapted predictions and profile descriptions (see Table 9 - 14). Considering the complexity of the current study's temperament profiles, adapted predictions more accurately account for theoretical rationale regarding temperament's association with childhood social-behavioral outcomes. However, despite greater clarity and accuracy afforded by adapted predictions, the following hypotheses and questions were still investigated to provide a completely candid narrative of the current study's original design.

Hypothesis 1: There will be a significant relationship between temperament profile membership and concurrent problem behavior, such that children who are classified into different temperamental groups will diverge in their expression of externalizing and internalizing problem behaviors.

Parent-Rated Temperament Profiles

Hypothesis 1a: As maintained by both variable-centric and person-centric research, high levels of activity, greater negative emotionality, and poor self-regulatory skills contribute to increased externalizing behavior, whereas extreme

levels of perceptual sensitivity (*high or low*), high inhibition, and high negative emotionally relate to greater internalizing behavior concerns (Sanson et al., 2004; Gartstein et al., 2016). The extant literature also maintains the key importance of self-regulatory abilities in moderating the development of such behaviors. Therefore, the following profiles were expected to vary in a way that resembles previous empirical findings.

Externalizing

Considering previous findings regarding temperament and the development of externalizing problem behaviors, children characterized by high negative emotionality and high activity are likely to exhibit such behaviors, but only when paired with low levels of behavioral and emotional regulation. In the present sample, 'Exuberant and Dysregulated' and 'Negative Emotionally Reactive and Dysregulated' children exhibit greater emotional reactivity as well as weaker self-regulation. As such, children characterized as 'Exuberant and Dysregulated' or 'Negative Emotionally Reactive and Dysregulated' were expected to display greater externalizing problem behaviors as compared to 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' and 'Reserved and Regulated' children. Additionally, Waldrip's (2023) 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' and 'Reserved and Regulated' profile is distinguished by moderately high self-regulation and moderately low negative affectivity. Therefore, children characterized as 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' and 'Reserved and Regulated' were expected to display the lowest

level of externalizing problem behaviors in contrast to all other parent-rated groups.

Internalizing

Research suggests that extreme levels of perceptual sensitivity (*high or low*), high inhibition, and high negative emotionally relate to greater internalizing behavior concerns, which is heightened when paired with lower levels emotional regulation. While children characterized as 'Under Attuned to Subtlety and Dysregulated' do not display high negative emotionality or high inhibition, the combination of very low perceptual sensitivity and moderately low emotion regulation implies greater likelihood of internalizing problem behaviors. Additionally, Waldrip's (2023) 'Reserved and Regulated' profile group exemplifies high inhibition, low positive affectivity, and average levels of behavioral and emotional regulation. Owing to such characteristics, both 'Reserved and Regulated' and 'Under Attuned to Subtlety and Dysregulated' children were expected to display greater internalizing problem behaviors as compared to 'Exuberant and Dysregulated', 'Negative Emotionally Reactive and Dysregulated', and 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' children. Following predictions for externalizing behavior problems, children characterized as 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' were expected to exhibit the lowest level of internalizing problem behaviors in comparison to all other parent-rated groups.

Descriptive Analyses

Waldrip (2023) identified one parent-reported profile that is not represented in previous research. The 'Exuberant and Regulated' profile type represented only 2% of the sample and was marked by moderately high activity, approach, and self-regulation, but low levels of *both* positive and negative affectivity. Due to the low proportion of children represented by this profile and its divergence from established literature, it was not included in analyses. However, descriptive information for this profile group was still reported, as this group is likely clinically significant and empirically valuable.

Teacher-Rated Temperament Profiles

Hypothesis 1b: In accordance with predictions for parent-rated temperament profiles, teacher-rated temperament profiles were expected to corroborate claims that children characterized by high reactivity and low regulation display greater externalizing behavior, whereas children characterized by extreme perceptual sensitivity (*high or low*), high reactivity, and high inhibition display greater internalizing behavior. Likewise, self-regulatory ability was expected to play a central role in the development of internalizing and externalizing behaviors for the following profiles.

Externalizing

Waldrip's (2023) 'Negative Emotionally Reactive and Dysregulated' profile is characterized by high negative affectivity and low self-regulation. Given the importance of self-regulatory abilities in the development of externalizing problem behaviors, children identified as 'Negative Emotionally Reactive and Dysregulated' were expected to display greater externalizing problem behaviors

as compared to children classified by 'regulated' profile types (i.e. 'Low to Average Reactive and Regulated', 'Negatively Emotionally Reactive but Regulated', 'Exuberant and Regulated', 'Reserved and Regulated'). Furthermore, children labeled as 'Exuberant and Regulated' were expected to exhibit the lowest level of externalizing problem behaviors in comparison to all other teacher-rated groups, as these children demonstrate moderately high levels of exuberance, positive affect, and self-regulatory ability.

Internalizing

Extreme levels of perceptual sensitivity (*high or low*), high inhibition, and high negative emotionally have been known to predict internalizing problem behaviors, particularly when paired with lower levels emotional regulation. While 'Reserved and Regulated' children are characterized by average regulation, they are rated as substantially low in exuberance and positive affect. Thus, 'Reserved and Regulated' were expected to display greater internalizing problem behaviors than profile types not marked by inhibition (i.e. 'Low to Average Reactive and Regulated', 'Negatively Emotionally Reactive but Regulated', 'Exuberant and Regulated', 'Negative Emotionally Reactive and Dysregulated'). Additionally, 'Exuberant and Regulated' children were expected to exhibit the lowest level of internalizing behaviors in comparison to all other teacher-rated groups, as these children demonstrate moderately high levels of exuberance, positive affect, and self-regulatory ability.

Descriptive Analyses

Waldrip (2023) identified two teacher-reported profiles that do not resemble profiles found within previous research, both of which represent small proportions of the present sample. The first, 'Exuberant and Dysregulated', represented only 4% of the sample and was characterized by high exuberance, moderately high positive affect, and low self-regulation. The second profile, 'High Reactive and Dysregulated', made up 2% of the sample and was marked by high exuberance, high positive affectivity, high anger, and low self-regulation. Due to the low proportion of children represented by both of the aforementioned profiles and their possible clinical significance, all analyses of the two profiles were descriptive.

Hypothesis 2: There will be a significant relationship between temperament profile membership and concurrent social functioning, such that children who are classified into different temperamental groups will diverge in their expression of overall social skills.

Parent-Rated Temperament Profiles

Hypothesis 2a: Established theory suggests that any profile characterized by extreme levels of perceptual sensitivity (*high or low*), high negative emotionality, and low self-regulation predicts lower social skills (Eisenberg et al., 2006; Evans et.al, 2012; Laible et al. 2014). Consistent with empirical findings regarding problem behaviors, self-regulation appears to be particularly influential in the development of prosocial behavior as well. Given this notion, children identified by Waldrip (2023) as substantially 'emotionally reactive' and 'dysregulated' were expected to exhibit lower levels of social functioning as compared to other children in the sample. Thus, children characterized by 'Exuberant and

Dysregulated', 'Negatively Emotionally Reactive and Dysregulated', and 'Under Attuned to Subtlety and Dysregulated' profile types were expected to display lower overall social skills as compared to 'Reserved and Regulated' and 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' children. In addition, children identified as 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' were expected to reflect the highest overall social skills, as this group of children is characterized by moderately high emotional and behavioral regulatory abilities and moderately low negative affectivity.

Teacher-Rated Temperament Profiles

Hypothesis 2b: Following aforementioned predictions regarding parent-rated profiles, extreme levels of perceptual sensitivity (*high or low*), high negative emotionality, and low self-regulation likely predict lower levels social functioning. As such, 'Negatively Emotionally Reactive and Dysregulated' children, who are characterized by high anger, fear, and sadness, as well as moderately low behavioral and emotional regulation, were expected to display lower overall social skills as compared to 'Exuberant and Regulated', 'Reserved and Regulated', Low to Average Reactive and Regulated', and 'Negatively Emotionally Reactive but Regulated' children. Conversely, 'Exuberant and Regulated' children, who are characterized by moderately high exuberance, positive affect, and emotion regulation, as well as low fear and sadness, were expected to display greater overall social functioning as compared to all other teacher-rated groups.

Research Questions – Exploratory Analyses

Research Question 1: *Is profile membership associated with differences in the expression of specific problem behaviors such as bullying, hyperactivity/inattention, and Autism Spectrum Disorder-related behaviors?*

Although there is reason to believe that specific problem behaviors (i.e. hyperactivity/attention) vary by profile membership, there has been no former research that would support such hypotheses. With respect to the association of temperament profiles with specific problem behaviors such as bullying, hyperactivity/inattention, and Autism Spectrum Disorder-related behavior, person-centered research has been very limited (Janson & Mathieson, 2008; Sanson et al., 2009; Van den Akker, 2010). For instance, Rothbart and Bates (2006) imply that greater self-regulatory ability promotes greater attention to situational demands, further suggesting that children's self-regulation impacts the presence of problem behaviors such as hyperactivity/inattention. However, little is known about the patterns of problem behavior attributable to a whole collection of temperament traits. As there is no known person-centered research examining the aforementioned behaviors, analysis of these particular problem behaviors was exploratory, and more specific hypotheses could not be made.

Research Question 2: *Is profile membership associated with differences in the expression of specific social skills such as communication, cooperation, responsibility, empathy, assertion, engagement, and self-control?*

There is also reason to believe that specific social skills (i.e. cooperation) vary by profile membership, yet there has been no former research that would support

such hypotheses. With respect to the association of temperament profiles with specific social skills such as communication, cooperation, responsibility, empathy, assertion, engagement, and self-control, literature has been limited and often mixed (Sanson et al., 2009; Laible, 2014). Existing literature suggests that the impact of negative emotionality on social functioning could be disaggregated to distinguish differences in specific prosocial behavior based on *types* of negative emotion. For instance, Eisenberg et. al (2006) speculate that temperamental sadness and fear promote greater guilt and empathy, whereas high levels of temperamental anger imply greater aggression or lack of empathy. However, some studies have suggested that anger may actually promote greater attention to goals and self-directed behavior (Khan et al., 2019; Lench et al., 2023). As person-centered research on such speculations is nonexistent, analyses of these particular social skills was exploratory.

Table 9

Original and Reordered Predictions for Externalizing Problem Behavior of Parent-Rated Profiles

Original Predictions	Reordered Predictions	Profile Description of Reordered Predictions	Rationale (*if applicable*)
Negatively Emotionally Reactive and Dysregulated[A] (13)	Negatively Emotionally Reactive and Dysregulated[A] (13)	Low positive affect, low levels of low intensity pleasure, low behavior regulation, low emotion regulation; mod. high internalizing emotion; mod. low perceptual sensitivity; mod. high anger	
Exuberant and Dysregulated[A] (38)	Exuberant and Dysregulated[A] (38)	Mod. high exuberance, mod. high positive affect, and mod. high anger; mod. low behavior regulation	
Under Attuned to Subtlety and Dysregulated[B] (17)	Under Attuned to Subtlety and Dysregulated[B] (17)	Low perceptual sensitivity; mod. low levels of low intensity pleasure, mod. low internalizing emotion, and mod. low emotion regulation	**No changes for any original predictions.**
Reserved and Regulated[B] (21)	Reserved and Regulated[B] (21)	Low exuberance and low positive affect	
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated[C] (40)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated[C] (40)	Mod. high emotion regulation, mod. high behavior regulation, and mod. low levels of low intensity pleasure; mod. low anger; mod. high positive affect	

Note. Profiles are ordered from *(predicted)* highest scoring to lowest scoring profiles. Higher scores indicate higher levels of problem behaviors and higher levels of social skills. Post hoc comparison predictions follow A > B > C.

Table 10

Original and Reordered Predictions for Internalizing Problem Behavior of Parent-Rated Profiles

Original Predictions	Reordered Predictions	Profile Description of Reordered Predictions	Rationale (*if applicable*)
Reserved and Regulated[A] (21)	Negatively Emotionally Reactive and Dysregulated[A] (13)*	**Low positive affect, low levels of low intensity pleasure, low behavior regulation, low emotion regulation**; mod. high internalizing emotion; mod. low perceptual sensitivity; mod. high anger	The extent of departure in low positive affect, in combination with low levels of low intensity pleasure, low behavior regulation, and low emotion regulation increases the Negatively Emotionally Reactive and Dysregulated group's risk for internalizing behavior.
Under Attuned to Subtlety and Dysregulated[A] (17)	Reserved and Regulated[A] (21)*	Low exuberance and low positive affect	
Negatively Emotionally Reactive and Dysregulated[B] (13)	Under Attuned to Subtlety and Dysregulated[B] (17)*	Low perceptual sensitivity; mod. low levels of low intensity pleasure, mod. low internalizing emotion, and **mod. low emotion regulation**	The Under Attuned to Subtlety and Dysregulated group's moderately low internalizing emotion and *average behavior regulation* decreases risk for internalizing behavior.
Exuberant and Dysregulated[B] (38)	Exuberant and Dysregulated[B] (38)	Mod. high exuberance, mod. high positive affect, and mod. high anger; mod. low behavior regulation	
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated[C] (40)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated[C] (40)	Mod. high emotion regulation, mod. high behavior regulation, and mod. low levels of low intensity pleasure; mod. low anger; mod. high positive affect	

Note. Profiles are ordered from *(predicted)* highest scoring to lowest scoring profiles. Higher scores indicate higher levels of problem behaviors and higher levels of social skills. Post hoc comparison predictions follow A > B > C.

Table 11

Original and Reordered Predictions for Social Skills of Parent-Rated Profiles

Original Predictions	Reordered Predictions	Profile Description of Reordered Predictions	Rationale (*if applicable*)
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated[A] (40)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated[A] (40)	Mod. high emotion regulation, mod. high behavior regulation, and mod. low levels of low intensity pleasure; mod. low anger; mod. high positive affect	
Reserved and Regulated[B] (21)	Under Attuned to Subtlety and Dysregulated[B] (17)*	Low perceptual sensitivity; mod. low levels of low intensity pleasure, mod. low internalizing emotion, and mod. low emotion regulation	The extent of departure in low exuberance and positive affect in addition to *only average* behavioral and emotional regulation predicts lower social functioning for the Reserved and Regulated group.
Under Attuned to Subtlety and Dysregulated[C] (17)	Exuberant and Dysregulated[B] (38)*	Mod. high exuberance, mod. high positive affect, and mod. high anger; mod. low behavior regulation	
Exuberant and Dysregulated[C] (38)	Reserved and Regulated[B] (21)*	**Low exuberance and low positive affect**	
Negatively Emotionally Reactive and Dysregulated[C] (13)	Negatively Emotionally Reactive and Dysregulated[C] (13)	Low positive affect, low levels of low intensity pleasure, low behavior regulation, low emotion regulation; mod. high internalizing emotion; mod. low perceptual sensitivity; mod. high anger	

Note. Profiles are ordered from *(predicted)* highest scoring to lowest scoring profiles. Higher scores indicate higher levels of problem behaviors and higher levels of social skills. Post hoc comparison predictions follow A > B > C.

Table 12

Original and Reordered Predictions for Externalizing Problem Behavior of Teacher-Rated Profiles

Original Predictions	Reordered Predictions	Profile Description of Reordered Predictions	Rationale (*if applicable*)
Negatively Emotionally Reactive and Dysregulated[A] (12)	Negatively Emotionally Reactive and Dysregulated[A] (12)	Low emotion regulation; high anger and high internalizing emotion; mod. low behavior regulation and mod. low positive affect	
Negative Emotionally Reactive but Regulated[B] (22)	Negative Emotionally Reactive but Regulated[B] (22)	Mod. high internalizing emotion and mod. high anger	
Reserved and Regulated[B] (11)	Exuberant and Regulated[B] (31)*	**Low internalizing emotion**; mod. high exuberance and mod. high positive affect; mod. low levels of low intensity pleasure; mod. high emotion regulation	The extent of departure in low internalizing emotion and *only average* behavioral regulation increases the Exuberant and Regulated group's risk for externalizing behavior.
Low to Average Reactive and Regulated[B] (48)	Reserved and Regulated[B] (11)*	Low positive affect and low exuberance	
Exuberant and Regulated[C] (31)	Low to Average Reactive and Regulated[C] (48)*	Mod. low exuberance; mod. high behavior regulation	

Note. Profiles are ordered from *(predicted)* highest scoring to lowest scoring profiles. Higher scores indicate higher levels of problem behaviors and higher levels of social skills. Post hoc comparison predictions follow A > B > C.

Table 13

Original and Reordered Predictions for Internalizing Problem Behavior of Teacher-Rated Profiles

Original Predictions	Reordered Predictions	Profile Description of Reordered Predictions	Rationale (*if applicable*)
Reserved and Regulated[A] (11)	Negatively Emotionally Reactive and Dysregulated[A] (12)*	**Low emotion regulation; high anger and high internalizing emotion; mod. low behavior regulation** and mod. low positive affect	The extent of departure in low emotion regulation, internalizing emotion, and anger in combination with mod. low behavior regulation increases the Negatively Emotionally Reactive and Dysregulated group's risk for internalizing behavior.
Negatively Emotionally Reactive and Dysregulated[B] (12)	Reserved and Regulated[A] (11)*	Low positive affect and low exuberance	
Low to Average Reactive and Regulated[B] (48)	Negative Emotionally Reactive but Regulated[A](22)*	Mod. high internalizing emotion and mod. high anger	The Low to Average Reactive and Regulated group's mod. high behavioral regulation likely decreases risk for internalizing behavior.
Negative Emotionally Reactive but Regulated[B] (22)	Low to Average Reactive and Regulated[B] (48)*	Mod. low exuberance; **mod. high behavior regulation**	
Exuberant and Regulated[C] (31)	Exuberant and Regulated[C] (31)	Low internalizing emotion; mod. high exuberance and mod. high positive affect; mod. low levels of low intensity pleasure; mod. high emotion regulation	

Note. Profiles are ordered from *(predicted)* highest scoring to lowest scoring profiles. Higher scores indicate higher levels of problem behaviors and higher levels of social skills. Post hoc comparison predictions follow A > B > C.

Table 14

Original and Reordered Predictions for Social Skills of Teacher-Rated Profiles

Original Predictions	Reordered Predictions	Profile Description of Reordered Predictions	Rationale (*if applicable*)
Exuberant and Regulated[A] (31)	Low to Average Reactive and Regulated[A] (48)*	Mod. low exuberance; **mod. high behavior regulation**	The Exuberant and Regulated group's *only average* behavioral regulation may not predict greater overall social skills than the Low to Average Reactive and Regulated group (mod. high behavior regulation).
Low to Average Reactive and Regulated[B] (48)	Exuberant and Regulated[A] (31)*	Low internalizing emotion; **mod. high exuberance and mod. high positive affect**; mod. low levels of low intensity pleasure; mod. high emotion regulation	
Reserved and Regulated[B] (11)	Reserved and Regulated[B] (11)	Low positive affect and low exuberance	
Negative Emotionally Reactive but Regulated[B] (22)	Negative Emotionally Reactive but Regulated[B] (22)	Mod. high internalizing emotion and mod. high anger	
Negatively Emotionally Reactive and Dysregulated[C] (12)	Negatively Emotionally Reactive and Dysregulated[C] (12)	Low emotion regulation; high anger and high internalizing emotion; mod. low behavior regulation and mod. low positive affect	

Note. Profiles are ordered from *(predicted)* highest scoring to lowest scoring profiles. Higher scores indicate higher levels of problem behaviors and higher levels of social skills. Post hoc comparison predictions follow A > B > C.

Chapter 3: Methods

Design

The current study used an existing cross-sectional dataset, collected by University of Maryland's Temperament and Narratives Lab, that comprises parent and teacher reported temperament, executive functioning, social competence, and school readiness of Kindergarten students. The current study operates as an extension of a former investigation, in which Latent Profile Analysis (LPA) identified two sets of temperament profiles; one based on teacher-reported temperament (Children's Behavior Questionnaire – Short Form; CBQ-SF; Putnam & Rothbart, 2006) and one based on parent-reported temperament (Children's Behavior Questionnaire – Teacher Short Form; CBQ-TSF; Teglasi et al., 2015). Children's temperament profiles were used to investigate patterns of associations between temperament profile membership and children's social behaviors, as measured by the Social Skills Improvement System (SSIS; Gresham & Elliot, 2008). More specifically, the present study employed a person-centered approach to examine whether children with different constellations of temperament characteristics display differences in concurrent behavior problems and social skills as assessed by parent and teacher ratings. Parent and teacher data were analyzed separately.

Participants and Procedures

Data were gathered from 133 kindergarten students (57 % male, 43% female), their parents (n = 133), and their teachers (n = 35). Students were recruited from 11 elementary schools; 9 schools in the District of Columbia, Maryland, Virginia (DMV) region of the United States, 1 elementary school in Chicago, Illinois, and 1 elementary school in New York City, New York. Of the 11 elementary schools, 9 are considered private institutions and 2 are considered public institutions. Based on parent report, 58% of kindergarten students identified as European

American, 9% identified as African American, 8% identified as Latino American, 13% identified as Asian American, and 12% were identified in the 'Other or Multi-Racial' categorization. The mean age of participating kindergarteners was 68.6 months (SD = 5.06). Parent reported education level and occupation suggest that participating families were largely middle class.

In alignment with IRB approved procedures, parents and teachers gave informed consent. Those who consented to the study were provided with access to the Child Behavior Questionnaire (CBQ) and the Social Skills Improvement System (SSIS), along with other questionnaires about the student's temperament, executive functioning, social competence, and school readiness. Students also completed laboratory activities guided by doctoral students in University of Maryland's Temperament and Narratives lab. These activities measured executive functioning, social competence, emotion understanding, and vocabulary. However, student activity data was not used for the purpose of this study. Data collection has since been completed, and participant data has been de-identified to maintain confidentiality.

Measures

The Children's Behavior Questionnaire (CBQ)

The Children's Behavior Questionnaire (CBQ; Rothbart et al., 2001) is a comprehensive measure of temperament as defined by individual differences in reactivity and regulation. The present student utilized Short Forms of the Children's Behavior Questionnaire to examine child temperament from the perspectives of both parents and teachers, Parents completed the Short Form of the Children's Behavior Questionnaire (CBQ-SF; Putnam & Rothbart, 2006), and teachers completed an adaptation of the Short Form specifically designed for teachers (CBQ-TSF; Teglasi et al., 2015). Both of the measures contain 94 items that capture the expression of childhood temperamental characteristics based on a seven-point Likert scale (1 = *extremely*

untrue of your child; 7 = *extremely true of your child*). The CBQ-SF and CBQ-TSF assesses 15 subscales of early to middle childhood temperament: activity level, anger/frustration, approach, attentional focusing, discomfort, falling reactivity/soothability, fear, high intensity pleasure, impulsivity, inhibitory control, low intensity pleasure, perceptual sensitivity, sadness, smiling/laughter, and shyness. These subscales are classified into three broad factors of temperament: effortful control, negative affectivity, and surgency (Rothbart et al., 2001). In a sample of young children, internal consistencies for each of the subscales, with a few exceptions, were adequate for the CBQ-SF ($\alpha = 0.55 – 0.89$; Putnam & Rothbart, 2006) and the CBQ-TSF ($\alpha = 0.68 – 0.92$; Teglasi et al., 2015). Waldrip (2023) found that each of the subscales demonstrated acceptable internal consistency in the present sample, with α-values ranging from .60 to .90 for the CBQ-SF and .69 to .91 for the CBQ-TSF. Waldrip also verified that intercorrelations among the subscales of the CBQ-SF and CBQ-TSF were consistent with those found in previous literature (Putnam & Rothbart, 2006; Teglasi et al., 2015).

The Social Skills Improvement System (SSIS)

The Social Skills Improvement System (SSIS; Gresham & Elliott, 2008) includes parent and teacher ratings of children in three broad areas: childhood social skills, problem behaviors, and academic competence. The SSIS includes the total social skills score along with separate scores for specific social skills, including communication, cooperation, assertion, responsibility, empathy, engagement, and self-control. The SSIS also includes informant reported scores on academic achievement in multiple areas as well as scores on problem behaviors like internalizing problem behaviors, externalizing problem behaviors, bullying, hyperactivity/inattention, and Autism Spectrum Disorder-related behaviors (Gresham & Elliott, 2008). The SSIS includes approximately 140 items, which evaluate general childhood behavior by asking parents and

teachers to rate the frequency that social skills and problem behaviors are exhibited by their child/student on a 4-point Likert scale (1 = *never*; 4 = *almost always*). This multi-informant design provides a comprehensive picture of child behavior and social skills across home and school settings (Gresham & Elliott, 2008). The SSIS demonstrated strong internal consistency in a sample of school-age children (α = 0.94– 0.96; Gresham & Elliott, 2008). In the present sample, internal consistencies across most subscales in both parent and teacher rating forms were adequate (see Table 15 and Table 16). With the exception of the Autism Spectrum subscale (α = 0.43–0.45), α-values were moderate to strong, ranging from .67 to .98 on parent-rated subscales and .84 to .98 on teacher-rated subscales. Intercorrelations among subscales were also explored on both parent and teacher-rated social skills and problem behaviors. For parent and teacher ratings of social skills, most subscales demonstrated significant positive correlations (see Table 17 and Table 19). For parent and teacher ratings of problem behavior, intercorrelations were significant and consistent with patterns found within the extant literature (see Table 18 and Table 20) (Gresham & Elliott, 2008).

It should be noted that, although Cronbach's alpha (Cronbach, 1951) is the most commonly used index of reliability, high α-values do not necessarily guarantee internal consistency (McNeish, 2018). In fact, a number of psychometric studies demonstrated discrepancies between reliability estimates generated by conventional Cronbach's alpha and alternative methods such as Revelle's omega total (Revelle, 1979), Greatest Lower Bound (GLB; Jackson and Agunwamba, 1977), and Coefficient *H* (Hancock and Mueller, 2001). Therefore, despite adequate internals consistencies found in the current study, aforementioned α-values should be interpreted with caution.

Table 15

Parent-Rated Social and Behavioral Descriptive Statistics

	N	Mean	Standard Deviation	Kurtosis	Skewness	α
Social Skills	132	95.24	11.96	.56	.26	.92
Communication	132	15.72	2.50	-.26	-.06	.67
Engagement	132	14.43	3.67	-.06	-.28	.86
Assertion	132	14.39	2.83	-.22	-.05	.63
Responsibility	132	11.95	2.51	1.05	-.12	.77
Self-Control	132	10.95	3.17	.08	-.16	.78
Cooperation	132	12.55	2.44	.32	.02	.80
Empathy	132	12.46	3.45	-.23	-.19	.88
Problem Behaviors	132	102.02	9.85	.07	.35	.98
Externalizing	132	8.00	3.79	.42	.40	.94
Internalizing	132	4.33	3.07	-.22	.59	.95
Hyperactivity/Inattention	132	5.98	2.74	1.13	.56	.88
Bullying	132	1.12	1.47	2.61	1.65	.96
Autism Spectrum	132	9.42	4.74	.78	.64	.45

Note. The Autism Spectrum subscale comprises items which correspond to both the Problem Behaviors and Social Skills composite scales. However, some items specific to the Autism Spectrum subscale are not included in the calculation of Problem Behaviors or Social Skills composite scale scores.

Table 16

Teacher-Rated Social and Behavioral Descriptive Statistics

	N	Mean	Standard Deviation	Kurtosis	Skewness	α
Social Skills	131	101.42	12.05	.12	.02	.98
Communication	132	16.17	2.91	.09	-.26	.91
Engagement	131	15.56	2.90	-.08	-.22	.92
Assertion	131	13.00	3.33	.22	-.05	.89
Responsibility	131	13.27	3.13	-.40	-.21	.92
Self-Control	131	13.51	3.95	.07	-.46	.93
Cooperation	132	12.67	3.42	-.65	-.28	.94
Empathy	132	12.61	3.02	-.17	.03	.93
Problem Behaviors	132	100.00	11.74	-.37	.54	.92
Externalizing	132	5.80	5.03	1.15	.94	.90
Internalizing	132	2.79	3.08	1.46	1.27	.85
Hyperactivity/Inattention	132	5.63	4.21	.07	.65	.88
Bullying	132	1.58	1.98	2.31	1.51	.84
Autism Spectrum	132	7.95	5.33	1.10	.81	.43

Note. The Autism Spectrum subscale comprises items which correspond to both the Problem Behaviors and Social Skills composite scales. However, some items specific to the Autism Spectrum subscale are not included in the calculation of Problem Behaviors or Social Skills composite scale scores.

Data Analysis

To investigate the relationship between temperament and children's social behavior, the current study utilized existing temperament profiles created from the present sample. The profiles were developed using latent profile analysis (LPA), a categorical latent variable approach, that identified average scores of child temperament based on several reactive and regulatory variables measured by the CBQ-SF and CBQ-TSF. In accordance with former factor analytic work and theoretical background established by Rothbart et. al (2001), Waldrip (2023) selected temperament variables that would fit the creation of her sample's profiles. From adapted Short Forms of the Children's Behavior Questionnaire, (CBQ-SF; Putnam & Rothbart, 2006; CBQ-TSF; Teglasi et al., 2015), Waldrip selected eight variables of temperament, some of which were aggregated from several scales of the CBQ-SF and CBQ-TSF. The final variables that were selected for latent profile analysis were as follows: exuberance (activity, approach, high intensity pleasure, and shyness), positive affect, internalizing emotion (fear and sadness), anger, emotion regulation, behavior regulation (attentional focusing and inhibitory control), low intensity pleasure, and perceptual sensitivity (see Appendix A). Children were then sorted into profiles depending on their deviation from their average score on each variable. Finally, several variations of profile groups were run to determine a best fitting profile solution for both parent and teacher ratings. In the enumeration of temperament profiles, Waldrip (2023) placed restrictions on the model due to the current study's sample size and lack of statistical power. To account for limited degrees of freedom, Waldrip restricted the model to only allow means to vary freely, while variances were restricted to be equal and covariances were restricted to be zero across profiles. For the sake of brevity, the complete class enumeration process will not be delineated, but readers are encouraged to consult Waldrip (2023) for greater detail. For all current analytical procedures, parent and teacher data were analyzed separately. Profile groups that comprised less

than 5% of the sample were excluded from formal analyses but were still descriptively compared to sample norms (see Appendix C).

Procedures for Missing Data

In the present dataset, two participants (< 1%) were missing teacher-rated outcome data and one participant (< 1%) was missing parent-rated outcome data. Due to the nature of the missing data, both participants lacked sufficient enough scores to perform a simple mean imputation. One participant displayed zero outcome data across all parent and teacher ratings, while the other lacked a substantial amount of data on teacher-rated social skills. When only outcome variables contain missing values, Hughes et al. (2019) suggest performing a complete case analysis (CCA). A complete case analysis describes a very basic strategy for addressing missing data, whereby a statistical analysis only includes cases with no missing values on any variables of interest. Additionally, complete case analysis is considered unbiased when data are classified as Missing Completely at Random (MCAR). This distinction can be made when the probability of missingness is the same for all cases and is reasonably unrelated to any other variables of interest. One way that researchers can assess whether data is truly missing completely at random is by performing Little's Missing Completely at Random test (Little, 1988), which indicates that missing data is truly missing completely at random with p-values greater than $\alpha = 0.05$. In the current dataset, Little's MCAR test confirmed that the aforementioned missing data can be considered missing completely at random ($\chi 2 = 5.44$, $\alpha = 0.79$). If less than 5% of the sample is missing completely at random, Tabachnick and Fidell (2007) argue that almost any procedure for handling missing values yields similar results. Therefore, in the present study, one participant was be excluded completely from analyses, while the other was only be excluded from analysis of teacher-rated social skills. As such, the present

study's sample size varied between 132 and 131 participants depending on the nature of the analysis.

Procedures for Outliers

The distribution of almost all outcome variables across informants were non-normal; only teacher-rated total social skills was identified as normally distributed by a Kolmogorov-Smirnov test of normality (d = .07, α = .176). Due to nonnormality of the data, outliers in the present sample were identified by the Tukey, Boxplot, or IQR method (Tukey, 1977). This method is a particularly useful graphical approach that is known to be robust when applied to skewed data distributions. The approach identifies outliers based on percentiles rather than by mean and standard deviation statistics, thus exhibiting less sensitivity to extreme values. Specifically, the Tukey method pinpoints the middle 50% of values within a dataset (IQR), which can then be used to calculate internal and external boundaries of potential outliers. According to Dawson (2011), outliers that fall below Q1 - 1.5(IQR) or above Q3 + 1.5(IQR), are defined as possible or probable outliers respectively. In the current dataset, possible outliers were detected across psychosocial outcome variables (15% of parent-rated data, 12% of teacher-rated data), though no outliers were considered problematic. When examining parent-rated outcome data, no more than three possible outliers were identified within each variable, except for parent-rated responsibility which displayed five possible outliers. Similarly, no more than three possible outliers were identified in each teacher-rated outcome variables. While these are believed to be true outliers that reflect the natural variation of the target population, such information was considered in the selection of robust analytical procedures.

Procedures for Nested Effects

In the current study, students were recruited from 29 classrooms across 11 different elementary schools, with teachers providing ratings for as few as one to as many as 19 students. As such, Waldrip (2023) felt it was imperative to address nested random effects, which if unaccounted for, are known to produce underestimated standard errors or increased risk for Type I error. McNeish and Harring (2016) suggest accounting for such an effect by adjusting standard errors and/or fit statistics through design-based methodology or model-based methodology. In the enumeration of the current study's temperament profiles, Waldrip (2023) utilized design-based methodology, applying a 'sandwich' estimator procedure in which robust standard errors were generated to account for deviations from model assumptions. The same design-based methodology was applied in the current study, as robust standard errors were also utilized when analyzing the relationship between temperament profile membership and selected social-developmental outcome variables.

Procedures for Covariate Effects

Waldrip (2023) investigated age and gender covariate effects on children's temperament profile membership, though significant covariate effects were not found. Additionally, while the current dataset includes information regarding particpants' race/ethnicity and socioeconomic status, limitations of the data (i.e. disproportionate group sizes) prevented meaningful investigation of these variables. Given the scope of the current study's research questions, covariate effects were not explored further. In future iterations of the current study, researchers might consider how age, gender, and other demographic variables impact the relationship between children's temperament profiles and various social-developmental outcomes.

Selection of Analytic Procedures for Comparison of Profiles

Mixture models, such as latent profile analysis (LPA) and latent class analysis (LCA), have increasingly gained traction in developmental and sociological research, which is likely due to the previously mentioned benefits of understanding population heterogeneity through person-centered methodology. The motivation to study the relationship between latent profile membership and a number of different outcomes may seem intuitive from a theoretical standpoint, but the inclusion of outcome variables in mixture modeling is definitely not methodologically straightforward. At this time, several analytical approaches to mixture modeling are known to researchers, each offering unique advantages and disadvantages given the context of the research. However, a central challenge inherent to mixture modeling is that traditional methodological approaches often fail to consider the measurement model of a latent profile solution in the investigation of predictive relationships that connect latent profile membership to outcome variables (Nylund-Gibson et al., 2019). Extensive multidisciplinary consultation was warranted to determine the most appropriate analytical approach for addressing the present study's central research questions.

Most of the modern approaches used to explore the relationship between latent profile membership and outcome variables are categorized as "stepwise" approaches, in which a latent profile model is first estimated and then subsequently used for separate predictive models including one or more outcomes. One of the most common, yet outdated stepwise approaches is referred to as the classify-analyze approach (Clogg, 1995). The classify-analyze approach regards latent profile membership as an observed grouping variable with values determined by modal class assignment (Dziak et al., 2016). Each participant is assigned to the profile group in which they have the highest estimated probability of membership, and such information is

applied in following analyses (i.e. ANOVA) as particpants' true profile assignment. While this technique appears to be relatively straightforward, it demonstrates a critical analytical oversight. The enumeration of a latent profile solution generally accrues measurement and estimation error, thus the treatment of latent profile assignment as an observed variable with no classification error leads to biased estimation of the association between latent profile membership and other external variables (Bakk, Tekle, & Vermunt, 2013). Some scholars suggest that classification error poses negligible bias when profile solutions display high entropy values (> .80) (Grimm & Ram, 2009). However, it seems impractical to apply such methodology when other more empirically supported techniques exist. While the use of outdated techniques like the classify-analyze method are no longer supported in recent literature, researchers still currently utilize this method due to the ease associated with traditional methodology and the sometimes-complicated nature of new statistical methodology.

At this time, the most reputable techniques for estimating the relationship between latent profile membership and outcome variables are methods that explicitly account for classification error. Among improved methodology is a stepwise approach known as the BCH approach, which was initially developed by Bolck, Croon, and Hagenaars (2004) for application with categorical covariates and was later modified by Vermunt (2010) to include continuous covariates and distal outcome variables. Similar to other stepwise approaches, the modified BCH approach begins with the estimation of a latent profile model, followed by modal or proportional class assignment and creation of an observed variable representing profile membership. To explore the relationship between profile membership and an outcome variable, a linear regression model is generated in which profile membership is weighted by the inverse of measurement error estimated during enumeration of the original latent profile model. According to multiple

scholars, the modified BCH approach is the most robust method for relating latent profile membership to continuous outcome variables (Asparouhov & Muthen, 2014; Dziak et al., 2016; Nylund-Gibson et al., 2019; Bakk & Kuha, 2021), as this method accounts for classification error and is generally insensitive to violations of normality and homoscedasticity. Therefore, the current study utilizes the modified BCH approach to estimate the relationship between parent and teacher-rated temperament and concurrent ratings of children's problem behavior and social functioning. The classify-analyze approach was also performed to serve as an analytical comparison and to provide supplemental information as needed (see Appendix D). Data were analyzed using the Statistical Package for the Social Sciences (SPSS), Version 29.0.2.0 (IBM Corp., 2023) and Latent GOLD, Version 6.0 (Statistical Innovations, 2024).

Problem Behavior

For teacher-rated and parent-rated profile solutions, two discrete univariate analyses were performed to identify differences between temperament profiles on internalizing problem behaviors and externalizing problem behaviors, as measured by the Social Skills Improvement System (SSIS; Gresham & Elliott, 2008). A modified version of the BCH method (Vermunt, 2010), which is a well-known and highly preferred method for relating class membership to continuous outcomes, was performed in Latent GOLD, Version 6.0. Two composite ratings of children's externalizing and internalizing problem behaviors were entered individually into separate models in which profile membership was treated as an independent variable. Additionally, the BCH approach was utilized to investigate differences among temperament profiles on more specific subscales of problem behaviors. Specific behavior problems were represented by subscales of bullying, hyperactivity/inattention, and Autism Spectrum Disorder-related behaviors. For all analyses, follow-up post-hoc comparisons *(Wald's chi-squared tests)*

were performed to determine the extent to which temperament profiles differed on concurrent problem behaviors.

Social Functioning

For teacher-rated and parent-rated profile solutions, a discrete univariate analysis was performed to identify differences between temperament profiles on an aggregate variable of social skills, as measured by the Social Skills Improvement System (SSIS; Gresham & Elliott, 2008). A modified version of the BCH method (Bolck, Croon, & Hagenaars, 2004), which is a well-known and highly preferred method for relating class membership to continuous outcomes, was performed in Latent GOLD, Version 6.0. A composite rating of children's social skills (i.e. total social skills) was entered individually into the proposed analyses of in which profile membership was treated as an independent variable. Additionally, the BCH approach was utilized to investigate differences among temperament profiles on more specific subscales of social behavior. Individual social skills were represented by subscales of communication, cooperation, assertion, responsibility, empathy, engagement, and self-control. For all analyses, follow-up post-hoc comparisons *(Wald's chi-squared tests)* were performed to determine the extent to which temperament profiles differ on concurrent social skills.

Chapter 4: Results

Preliminary Analysis

Before conducting formal analyses, descriptive information regarding parent-rated and teacher-rated social behavior were closely examined (see Table 15 and Table 16). Profile – specific descriptive statistics for all parent-rated and teacher-rated temperament profiles, including profiles which were omitted from formal analyses, are displayed in Appendix C. Bivariate intercorrelations among parent-rated and teacher-rated social skills and problem behavior were also examined. For parent and teacher ratings of social skills, most subscales demonstrated significant positive correlations (see Table 17 and Table 19). However, the Assertion subscale was nonsignificant and weakly related to the Cooperation subscale across informants. Additionally, for parent ratings of social skills, the Cooperation subscale was nonsignificant and weakly related to the Engagement subscale. While the investigation of discrete social skills was solely exploratory, appropriate caution is warranted in the interpretation of such subscales in the current sample. For parent and teacher ratings of problem behavior, intercorrelations were significant and consistent with patterns found within the extant literature (see Table 18 and Table 20) (Gresham & Elliott, 2008).

Table 17

Parent-Rated Social Skills Scale Intercorrelations

	Communication	Engagement	Assertion	Responsibility	Self-Control	Cooperation	Empathy
Communication	1						
Engagement	.49**	1					
Assertion	.33**	.59**	1				
Responsibility	.46**	.25**	.30**	1			
Self-Control	.41**	.35**	.23**	.55**	1		
Cooperation	.49**	.10	.07	.64**	.41**	1	
Empathy	.35**	.46**	.41**	.44**	.42**	.37**	1

* p < .05
** p < .01

Table 18

Parent-Rated Problem Behaviors Scale Intercorrelations

	Externalizing	Internalizing	Hyperactivity/Inattention	Bullying
Externalizing	1			
Internalizing	.36**	1		
Hyperactivity/Inattention	.79**	.25**	1	
Bullying	.68**	.29**	.50**	1

* p < .05
** p < .01

Table 19

Teacher-Rated Social Skills Scale Intercorrelations

	Communication	Engagement	Assertion	Responsibility	Self-Control	Cooperation	Empathy
Communication	1						
Engagement	.64**	1					
Assertion	.41**	.53**	1				
Responsibility	.72**	.45**	.32**	1			
Self-Control	.61**	.47**	.28**	.74**	1		
Cooperation	.65**	.32**	.12	.75**	.64**	1	
Empathy	.67**	.63**	.45**	.61**	.52**	.46**	1

* p < .05
** p < .01

Table 20

Teacher-Rated Problem Behavior Scale Intercorrelations

	Externalizing	Internalizing	Hyperactivity/Inattention	Bullying
Externalizing	1			
Internalizing	.40**	1		
Hyperactivity/Inattention	.89**	.39**	1	
Bullying	.75**	.31**	.51**	1

* p < .05
** p < .01

Relating Profiles of Temperament to Behavioral Outcomes

Multiple iterations of the modified BCH procedure (Vermunt, 2010) were performed to examine the relationship between temperament profile membership and concurrent problem behaviors of select parent-rated and teacher-rated profile groups. As hypothesized, significant differences were found among teacher-rated and parent-rated profile groups on measures of externalizing and internalizing problem behavior (Hypothesis 1). For each informant type, mean differences in externalizing and internalizing problem behavior by temperament profile membership were statistically significant ($p < 0.01$). Wald's chi-squared, post-hoc pairwise comparison tests were performed to examine *how* different temperamental groups diverged in their expression of externalizing and internalizing problem behavior. Results specific to both parent-rated and teacher-rated profile solutions are described in greater detail below. Exploratory analyses of specific problem behaviors such as bullying, hyperactivity/inattention, and Autism Spectrum Disorder-related behavior are also explained further. Class-specific mean comparisons and significance tests for both parent-rated and teacher-rated profile solutions are displayed in Tables 21 – 31 and Figures 3 – 4.

Parent-Rated Temperament Profiles on Problem Behaviors

As reported by parents, temperament profile membership was significantly associated with concurrent externalizing (W (4, 128) = 38.69, $p < .001$) and internalizing problem behaviors (W (4, 128) = 15.58, $p < .01$). Children's membership in parent-rated temperament profiles demonstrated a large effect on the expression of externalizing problem behaviors ($r^2 = 0.26$) yet displayed only a moderate effect on the expression of internalizing problem behaviors ($r^2 = 0.15$) (Cohen, 1988). Descriptive analysis revealed that Waldrip's (2023) 'Negative Emotionally Reactive and Dysregulated' profile group demonstrated the highest average ratings of

externalizing and internalizing problem behaviors, while the 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' profile group demonstrated the lowest average ratings of both externalizing and internalizing problem behaviors (see Table 27, Table 29, and Figure 3). Post-hoc pairwise comparisons uncovered additional complexity specific to individual categories of parent-rated problem behavior.

Externalizing Problem Behaviors

It was hypothesized that children characterized as 'Exuberant and Dysregulated' or 'Negative Emotionally Reactive and Dysregulated' would display greater externalizing problem behaviors as compared to 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' and 'Reserved and Regulated' children (Hypothesis 1a). This hypothesis was only partially supported. While children characterized by Waldrip's (2023) 'Negative Emotionally Reactive and Dysregulated' profile group displayed the highest average rating of externalizing problem behaviors (M = 10.15, SD = 3.85), pairwise comparisons revealed that the 'Negative Emotionally Reactive and Dysregulated' profile group was only significantly greater than the 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' group (see Table 21). Children classified as 'Negative Emotionally Reactive and Dysregulated', 'Under Attuned to Subtlety and Dysregulated', 'Exuberant and Dysregulated', and 'Reserved and Regulated' were not significantly different from one another on parent-rated externalizing problem behaviors. It was also hypothesized that children characterized by 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' and 'Reserved and Regulated' profile groups would display the lowest level of externalizing problem behaviors in contrast to all other parent-rated groups (Hypothesis 1a). This hypothesis was only partially supported. Children characterized as 'Positively Emotionally Reactive, Highly Attuned to

Subtlety, and Well-Regulated' (M = 10.15, SD = 3.85) and 'Reserved and Regulated' (M = 5.65, SD = 3.08) did display the lowest average ratings of externalizing problem behaviors, though the 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' profile group was the only profile type that was significantly different from all other parent-rated groups.

Table 21

Outcomes of Parent-Rated Profile Membership on Externalizing Problem Behaviors

Original Predictions	Reordered Predictions	Actual Outcome	Profile Description of Actual Outcome
Negatively Emotionally Reactive and Dysregulated^{A} (13)	Negatively Emotionally Reactive and Dysregulated^{A} (13)	Negatively Emotionally Reactive and Dysregulated^{A} (13)	Low positive affect, low levels of low intensity pleasure, low behavior regulation, low emotion regulation; mod. high internalizing emotion; mod. low perceptual sensitivity; mod. high anger
Exuberant and Dysregulated^{A} (38)	Exuberant and Dysregulated^{A}(38)	Under Attuned to Subtlety and Dysregulated^{A} (17)	Low perceptual sensitivity; mod. low levels of low intensity pleasure, mod. low internalizing emotion, and mod. low emotion regulation
Under Attuned to Subtlety and Dysregulated^{B} (17)	Under Attuned to Subtlety and Dysregulated^{B} (17)	Exuberant and Dysregulated^{A} (38)	Mod. high exuberance, mod. high positive affect, and mod. high anger; mod. low behavior regulation
Reserved and Regulated^{B} (21)	Reserved and Regulated^{B} (21)	Reserved and Regulated^{A} (21)	Low exuberance and low positive affect
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{C} (40)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{C} (40)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{B} (40)	Mod. high emotion regulation, mod. high behavior regulation, and mod. low levels of low intensity pleasure; mod. low anger; mod. high positive affect

Note. Profiles are ordered from highest scoring to lowest scoring profiles. Profiles that share a subscript are not significantly different from one another. $\alpha = 0.05$.

Internalizing Problem Behaviors

In the current study, 'Reserved and Regulated' and 'Under Attuned to Subtlety and Dysregulated' children were expected to display greater internalizing problem behaviors as compared to 'Exuberant and Dysregulated', 'Negative Emotionally Reactive and Dysregulated', and 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' children (Hypothesis 1a). This hypothesis was not supported in the present sample. Children classified as 'Negative Emotionally Reactive and Dysregulated'(*M* =7 .31, *SD* = 3.35) demonstrated the highest average rating of parent-rated internalizing problem behaviors and were found to be significantly different from 'Under Attuned to Subtlety and Dysregulated', 'Exuberant and Dysregulated', and 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' profile groups (see Table 22). Children categorized as 'Reserved and Regulated' (*M* = 5.10, *SD* = 2.70) demonstrated the second highest average rating of internalizing problem behaviors but did not differ significantly from any other profile groups. Children within the 'Under Attuned to Subtlety and Dysregulated' group (*M* = 4.18, *SD* = 2.94) fell within the middle of profile mean rankings and only demonstrated a significant difference from the 'Negative Emotionally Reactive and Dysregulated' group. It was also hypothesized that children characterized as 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' would exhibit the lowest level of internalizing problem behaviors in comparison to all other parent-rated groups (Hypothesis 1a). This hypothesis was only partially supported. While the 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' profile group (*M* = 3.68, *SD* = 2.81) exhibited the lowest average rating of internalizing problem behaviors, pairwise comparisons revealed that children characterized as 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' only significantly differed from

children characterized as ‘Negative Emotionally Reactive and Dysregulated’ on parent-rated internalizing problem behaviors.

Table 22

Outcomes of Parent-Rated Profile Membership on Internalizing Problem Behaviors

Original Predictions	Reordered Predictions	Actual Outcome	Profile Description of Actual Outcome
Reserved and Regulated[A] (21)	Negatively Emotionally Reactive and Dysregulated[A] (13)	Negatively Emotionally Reactive and Dysregulated[A] (13)	Low positive affect, low levels of low intensity pleasure, low behavior regulation, and low emotion regulation; mod. high internalizing emotion; mod. low perceptual sensitivity; mod. high anger
Under Attuned to Subtlety and Dysregulated[A] (17)	Reserved and Regulated[A] (21)	Reserved and Regulated[AB] (21)	Low exuberance and low positive affect
Negatively Emotionally Reactive and Dysregulated[B] (13)	Under Attuned to Subtlety and Dysregulated[B] (17)	Under Attuned to Subtlety and Dysregulated[B] (17)	Low perceptual sensitivity; mod. low levels of low intensity pleasure, mod. low internalizing emotion, and mod. low emotion regulation
Exuberant and Dysregulated[B] (38)	Exuberant and Dysregulated[B] (38)	Exuberant and Dysregulated[B] (38)	Mod. high exuberance, mod. high positive affect, and mod. high anger; mod. low behavior regulation
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated[C] (40)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated[C] (40)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated[B] (40)	Mod. high emotion regulation, mod. high behavior regulation, and mod. low levels of low intensity pleasure; mod. low anger; mod. high positive affect

Note. Profiles are ordered from highest scoring to lowest scoring profiles. Profiles that share a subscript are not significantly different from one another. $\alpha = 0.05$.

Bullying, Hyperactivity/Inattention, and Autism Spectrum Disorder

Due to lack of person-centered research on specialized problem behaviors, analyses of problem behaviors such as bullying, hyperactivity/inattention, and Autism Spectrum Disorder-related behavior were strictly exploratory. In the current study, exploratory analyses revealed that temperament profile membership was significantly associated with concurrently assessed bullying (W (4, 128) = 13.22, $p < .05$), hyperactivity/inattention (W (4, 128) = 30.12, $p < .001$), and Autism Spectrum-related behavior (W (4, 128) = 37.79, $p < .001$). Children's membership in parent-rated temperament profiles demonstrated a large effect on the expression of Autism Spectrum-related behavior ($r^2 = 0.30$), a moderate effect on the expression of bullying ($r^2 = 0.10$), and a moderate effect on the expression of hyperactivity/inattention ($r^2 = 0.23$) (Cohen, 1988). Post-hoc pairwise comparisons revealed several similarities across patterns of mean differences in parent-rated specialized problem behaviors (see Table 27 and Table 30). Children characterized as 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' demonstrated the lowest average ratings of bullying, hyperactivity/inattention, and Autism-Spectrum Disorder-related behavior. Conversely, children characterized as 'Negative Emotionally Reactive and Dysregulated' demonstrated the highest average ratings of bullying, hyperactivity/inattention, and Autism-Spectrum related behavior. On outcome variables of bullying and hyperactivity/inattention, the 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' profile group displayed significantly greater ratings than all other parent-rated profile groups, apart from the 'Reserved and Regulated' group. However, children classified as 'Negative Emotionally Reactive and Dysregulated' only exhibited a significant difference from the 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' group on each of the aforementioned variables. Regarding Autism Spectrum

Disorder-related behavior, children categorized as 'Negative Emotionally Reactive and Dysregulated' and 'Reserved and Regulated' displayed significantly higher ratings than 'Exuberant and Dysregulated', 'Under Attuned to Subtlety and Dysregulated', and 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' profile groups. Though 'Negative Emotionally Reactive and Dysregulated' and 'Reserved and Regulated' groups did not display significant differences among one another. Similarly, children characterized as 'Exuberant and Dysregulated', 'Under Attuned to Subtlety and Dysregulated', and 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' did not display significant differences between one another on parent-rated Autism Spectrum Disorder-related behaviors.

Teacher-Rated Temperament Profiles on Problem Behaviors

When rated by teachers, temperament profile membership was significantly associated with concurrently assessed externalizing (W (4, 128) = 63.76 $p < .001$) and internalizing problem behaviors (W (4, 128) = 59.33, $p < .001$). Kindergarten students' membership in teacher-rated temperament profiles demonstrated a large effect on the expression of externalizing problem behaviors ($r^2 = 0.40$) yet displayed only a moderate effect on the expression of internalizing problem behaviors ($r^2 = 0.22$) (Cohen, 1988). Descriptive analysis revealed that Waldrip's (2023) 'Negative Emotionally Reactive and Dysregulated' profile group demonstrated the highest average rating of externalizing problem behaviors, while the 'Low to Average Reactive and Regulated' profile group demonstrated the lowest average rating of externalizing problem behaviors. In regard to the expression of internalizing problem behaviors, descriptive analysis revealed that the 'Reserved and Regulated' profile group displayed the highest average rating, while children characterized by the 'Exuberant and Regulated' profile group exhibited the lowest

average rating (see Table 28, Table 29, and Figure 4). Post-hoc pairwise comparisons were examined in order to better understand the complexity specific to particular categories of teacher-rated problem behavior.

Externalizing Problem Behaviors

In the present study, children identified as 'Negative Emotionally Reactive and Dysregulated' were expected to display greater externalizing problem behaviors as compared to children classified by 'regulated' profile types (i.e. 'Low to Average Reactive and Regulated', 'Negatively Emotionally Reactive but Regulated', 'Exuberant and Regulated', 'Reserved and Regulated') (Hypothesis 1b). This hypothesis was supported, as children characterized by the 'Negative Emotionally Reactive and Dysregulated' profile group (M = 10.67, SD = 4.19) demonstrated the highest average rating of externalizing problem behaviors and differed significantly from all other teacher-rated profile groups (see Table 23). Conversely, children labeled as 'Exuberant and Regulated' were expected to exhibit the lowest level of externalizing problem behaviors in comparison to all other teacher-rated groups (Hypothesis 1b). This hypothesis was largely unsupported. Instead, pairwise comparisons revealed that children classified as 'Low to Average Reactive and Regulated' (M = 2.54, SD = 2.95) not only exhibited the lowest average ratings of externalizing problem behaviors but also demonstrated significant differences from all other teacher-rated profile types. The remaining profile groups (i.e. 'Negatively Emotionally Reactive but Regulated', 'Exuberant and Regulated', and 'Reserved and Regulated') did not significantly differ from one another on teacher-rated externalizing problem behaviors.

Table 23

Outcomes of Teacher-Rated Profile Membership on Externalizing Problem Behaviors

Original Predictions	Reordered Predictions	Actual Outcome	Profile Description of Actual Outcome
Negatively Emotionally Reactive and Dysregulated^{A} (12)	Negatively Emotionally Reactive and Dysregulated^{A} (12)	Negatively Emotionally Reactive and Dysregulated^{A} (12)	Low emotion regulation; high anger and high internalizing emotion; mod. low behavior regulation and mod. low positive affect
Negative Emotionally Reactive but Regulated^{B} (22)	Negative Emotionally Reactive but Regulated^{B} (22)	Negative Emotionally Reactive but Regulated^{B} (22)	Mod. high internalizing emotion and mod. high anger
Reserved and Regulated^{B} (11)	Exuberant and Regulated^{B} (31)	Exuberant and Regulated^{B} (31)	Low internalizing emotion; mod. high exuberance and mod. high positive affect; mod. low levels of low intensity pleasure; mod. high emotion regulation
Low to Average Reactive and Regulated^{B} (48)	Reserved and Regulated^{B} (11)	Reserved and Regulated^{B} (11)	Low positive affect and low exuberance
Exuberant and Regulated^{C} (31)	Low to Average Reactive and Regulated^{C} (48)	Low to Average Reactive and Regulated^{C} (48)	Mod. low exuberance; mod. high behavior regulation

Note. Profiles are ordered from highest scoring to lowest scoring profiles. Profiles that share a subscript are not significantly different from one another. $\alpha = 0.05$.

Internalizing Problem Behaviors

It was hypothesized that the 'Reserved and Regulated' profile group would display greater internalizing problem behaviors than profile types not marked by inhibition (i.e. 'Low to Average Reactive and Regulated', 'Negatively Emotionally Reactive but Regulated', 'Exuberant and Regulated', 'Negative Emotionally Reactive and Dysregulated') (Hypothesis 1b). This hypothesis was only partially supported. While the 'Reserved and Regulated' profile group (M = 5.00, SD = 2.90) demonstrated the highest average rating of internalizing problem behaviors, pairwise comparisons revealed that the 'Reserved and Regulated' group did not display significant differences from 'Negative Emotionally Reactive and Dysregulated' and 'Negatively Emotionally Reactive but Regulated' profile types (see Table 24). The 'Reserved and Regulated' profile group did, however, display greater internalizing problem behaviors as compared to 'Low to Average Reactive and Regulated' and "Exuberant and Regulated' profile types. It was also hypothesized that Exuberant and Regulated' children would demonstrate the lowest level of internalizing behaviors in comparison to all other teacher-rated groups (Hypothesis 1b). This hypothesis was supported, as pairwise comparisons revealed that children characterized by the 'Exuberant and Regulated' profile type (M = 0.90, SD = 1.08) exhibited the lowest average rating of internalizing problem behaviors and demonstrated significant differences from all other teacher-rated groups.

Table 24

Outcomes of Teacher-Rated Profile Membership on Internalizing Problem Behaviors

Original Predictions	Reordered Predictions	Actual Outcome	Profile Description of Actual Outcome
Reserved and Regulated^{A} (11)	Negatively Emotionally Reactive and Dysregulated^{A} (12)	Reserved and Regulated^{A} (11)	Low positive affect and low exuberance
Negatively Emotionally Reactive and Dysregulated^{B} (12)	Reserved and Regulated^{A} (11)	Negatively Emotionally Reactive and Dysregulated^{AB} (12)	Low emotion regulation; high anger and high internalizing emotion; mod. low behavior regulation and mod. low positive affect
Low to Average Reactive and Regulated^{B} (48)	Negative Emotionally Reactive but Regulated^{A}(22)	Negative Emotionally Reactive but Regulated^{AB} (22)	Mod. high internalizing emotion and mod. high anger
Negative Emotionally Reactive but Regulated^{B} (22)	Low to Average Reactive and Regulated^{B} (48)	Low to Average Reactive and Regulated^{B} (48)	Mod. low exuberance; mod. high behavior regulation
Exuberant and Regulated^{C} (31)	Exuberant and Regulated^{C} (31)	Exuberant and Regulated^{C} (31)	Low internalizing emotion; mod. high exuberance and mod. high positive affect; mod. low levels of low intensity pleasure; mod. high emotion regulation

Note. Profiles are ordered from highest scoring to lowest scoring profiles. Profiles that share a subscript are not significantly different from one another. $\alpha = 0.05$.

Bullying, Hyperactivity/Inattention, and Autism Spectrum Disorder

Due to lack of person-centered research on specialized problem behaviors, analyses of problem behaviors such as bullying, hyperactivity/inattention, and Autism Spectrum Disorder-related behaviors were strictly exploratory. In the present study, exploratory analyses revealed that temperament profile membership was significantly associated with concurrently assessed bullying (W (4, 128) = 16.80, $p < .01$), hyperactivity/inattention (W (4, 128) = 60.04, $p < .001$), and Autism Spectrum-related behaviors (W (4, 128) = 37.79, $p < .001$). Kindergarten students' membership in teacher-rated temperament profiles demonstrated a large effect on the expression of Autism Spectrum-related behaviors ($r^2 = 0.34$) and hyperactivity/inattention ($r^2 = 0.41$), as well as a moderate effect on bullying ($r^2 = 0.14$) (Cohen, 1988). Post-hoc pairwise comparisons revealed a few distinctions across patterns of mean differences in teacher-rated specialized problem behaviors (see Table 28 and Table 30). Children characterized as 'Low to Average Reactive and Regulated' demonstrated the lowest average ratings of bullying and hyperactivity/inattention, but children classified as 'Exuberant and Regulated' displayed the lowest average rating of Autism-Spectrum Disorder-related behavior. Conversely, children characterized as 'Negative Emotionally Reactive and Dysregulated' demonstrated the highest average ratings of bullying, hyperactivity/inattention, and Autism-Spectrum related behaviors. In regard to teacher ratings of hyperactivity/inattention, the 'Negative Emotionally Reactive and Dysregulated' profile group was rated significantly higher than all other teacher-rated groups. Additionally, children categorized as 'Exuberant and Regulated' and 'Negative Emotionally Reactive but Regulated' demonstrated significantly higher levels of hyperactivity/inattention than both 'Reserved and Regulated and 'Low to Average Reactive and Regulated' groups. Kindergarten students classified by 'Reserved and Regulated and 'Low to Average Reactive and

Regulated' profile groups also demonstrated significant differences among one another on teacher-rated hyperactivity/inattention, though 'Low to Average Reactive and Regulated' children ultimately exhibited the lowest level of hyperactivity/inattention. With respect to teacher ratings of bullying behavior, children categorized as 'Negative Emotionally Reactive and Dysregulated' only exhibited significantly higher ratings when compared to children categorized as 'Low to Average Reactive and Regulated'. On the outcome variable of bullying, 'Negative Emotionally Reactive and Dysregulated', 'Negative Emotionally Reactive but Regulated', 'Exuberant and Regulated', and 'Reserved and Regulated' profile group did not significantly differ from one another. Children characterized by the 'Low to Average Reactive and Regulated' group displayed significantly less bullying behavior than all other teacher-rated groups, though these children did not demonstrate a significant difference from children within the 'Reserved and Regulated' group. Lastly, children categorized as 'Negative Emotionally Reactive and Dysregulated', 'Negative Emotionally Reactive but Regulated', and 'Reserved and Regulated' differed significantly from 'Low to Average Reactive and Regulated' and 'Exuberant and Regulated' profile groups on teacher-rated Autism Spectrum Disorder-related behavior. Though, 'Negative Emotionally Reactive and Dysregulated', 'Negative Emotionally Reactive but Regulated', and 'Reserved and Regulated' profile groups were not significantly different from one another. Similarly, children characterized as 'Low to Average Reactive and Regulated' and 'Exuberant and Regulated' did not display significant differences between one another on teacher-rated Autism Spectrum Disorder-related behaviors.

Relating Profiles of Temperament to Social Outcomes

Multiple iterations of the modified BCH procedure (Vermunt, 2010) were performed to examine the relationship between temperament profile membership and concurrent social

functioning of select parent-rated and teacher-rated profile groups. As hypothesized, significant differences were found among teacher-rated and parent-rated profile groups on a composite measure of social functioning (Hypothesis 2). For each informant type, mean differences in overall social skills by temperament profile membership were highly statistically significant ($p < 0.001$). Wald's chi-squared, post-hoc pairwise comparison tests were performed to examine *how* different temperamental groups diverge in their expression of overall social skills. Results specific to both parent-rated and teacher-rated profile solutions are described in greater detail below. Exploratory analyses of specific social skills such communication, cooperation, responsibility, empathy, assertion, engagement, and self-control are also explained further. Class-specific mean comparisons and significance tests for both parent-rated and teacher-rated profile solutions are demonstrated in Tables 21 – 31 and Figures 3 – 4.

Parent-Rated Temperament Profiles on Social Functioning

As reported by parents, temperament profile membership was significantly associated with concurrently assessed social skills (W (4, 128) = 52.39, $p < .001$) in the present sample of kindergarten students. Children's membership in parent-rated temperament profiles demonstrated a large effect on the expression of overall social skills ($r^2 = 0.31$) (Cohen, 1988). Descriptive analysis revealed that Waldrip's (2023) 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' profile group demonstrated the highest average ratings of overall social functioning, while the 'Negatively Emotionally Reactive and Dysregulated' profile group demonstrated the lowest average ratings of overall social functioning (see Table 27 and Figure 3). Post-hoc pairwise comparisons demonstrated additional nuance among temperament profiles on parent-rated social skills (see Table 25 and Table 29) .

In the present study, children identified by Waldrip (2023) as substantially 'emotionally reactive' and 'dysregulated' were expected to exhibit lower levels of social functioning as compared to other children in the sample. It was therefore hypothesized that children characterized by 'Exuberant and Dysregulated', 'Negatively Emotionally Reactive and Dysregulated', and 'Under Attuned to Subtlety and Dysregulated' profile types would display lower overall social skills as compared to 'Reserved and Regulated' and 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' children. Additionally, children identified as 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' were expected to reflect the highest overall social skills (Hypothesis 2a). These hypotheses were only partially supported. While children classified as 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' (M = 103.13, SD = 11.18) demonstrated the highest average rating of overall social skills, pairwise comparisons revealed that 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' children did not exhibit significantly greater social skills when compared to children classified as 'Under Attuned to Subtlety and Dysregulated'. In fact, children characterized by the 'Under Attuned to Subtlety and Dysregulated' (M = 94.35, SD = 9.94) profile group exhibited the second highest average rating of overall social skills and demonstrated significantly greater overall social skills than the 'Negatively Emotionally Reactive and Dysregulated' profile type. Contrary to initial predictions, the 'Reserved and Regulated' group (M = 90.24, SD = 10.07) displayed generally lower ratings of overall social skills and only demonstrated a significant difference from the 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' profile group. The 'Exuberant and Dysregulated' profile group (M = 94.24, SD = 11.02) fell within the middle of profile mean rankings and reflected significant differences from 'Positively Emotionally

Reactive, Highly Attuned to Subtlety, and Well-Regulated' and 'Negatively Emotionally Reactive and Dysregulated' profile groups. Lastly, the 'Negatively Emotionally Reactive and Dysregulated' (M = 83.54, SD = 8.13) profile type represented the lowest average rating of overall social skills and demonstrated significantly lower social skills in comparison to all parent-rated groups, save for the 'Reserved and Regulated' profile group

Table 25

Outcomes of Parent-Rated Profile Membership on Overall Social Skills

Original Predictions	Reordered Predictions	Actual Outcome	Profile Description of Actual Outcome
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{A} (40)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{A} (40)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{A} (40)	Mod. high emotion regulation, mod. high behavior regulation, and mod. low levels of low intensity pleasure; mod. low anger; mod. high positive affect
Reserved and Regulated^{B} (21)	Under Attuned to Subtlety and Dysregulated^{B} (17)	Under Attuned to Subtlety and Dysregulated^{AB} (17)	Low perceptual sensitivity; mod. low levels of low intensity pleasure, mod. low internalizing emotion, and mod. low emotion regulation
Under Attuned to Subtlety and Dysregulated^{C} (17)	Exuberant and Dysregulated^{B} (38)	Exuberant and Dysregulated^{B} (38)	Mod. high exuberance, mod. high positive affect, and mod. high anger; mod. low behavior regulation
Exuberant and Dysregulated^{C} (38)	Reserved and Regulated^{B} (21)	Reserved and Regulated^{BC} (21)	Low exuberance and low positive affect
Negatively Emotionally Reactive and Dysregulated^{C} (13)	Negatively Emotionally Reactive and Dysregulated^{C} (13)	Negatively Emotionally Reactive and Dysregulated^{C} (13)	Low positive affect, low levels of low intensity pleasure, low behavior regulation, and low emotion regulation; mod. high internalizing emotion; mod. low perceptual sensitivity; mod. high anger

Note. Profiles are ordered from highest scoring to lowest scoring profiles. Profiles that share a subscript are not significantly different from one another. $\alpha = 0.05$.

Individual Social Skills

Due to lack of person-centered research on individual social skills, analyses of communication, cooperation, responsibility, empathy, assertion, engagement, and self-control were strictly exploratory. In the present sample of kindergarten students, temperament profile membership was significantly associated with concurrently assessed communication (W (4, 128) = 55.58, $p < .001$), cooperation (W (4, 128) = 45.83, $p < .001$), responsibility (W (4, 128) = 30.15, $p < .001$), empathy (W (4, 128) = 18.51, $p < .01$), assertion (W (4, 128) = 20.75, $p < .001$), engagement (W (4, 128) = 50.26, $p < .001$), and self-control (W (4, 128) = 43.90, $p < .001$). Children's membership in parent-rated temperament profiles demonstrated a large effect on the expression of communication ($r^2 = 0.27$), engagement ($r^2 = 0.34$), self-control ($r^2 = 0.29$) , and cooperation ($r^2 = 0.31$); and a moderate effect on assertion ($r^2 = 0.12$), responsibility ($r^2 = 0.22$), and empathy ($r^2 = 0.13$) (Cohen, 1988). Post-hoc pairwise comparisons revealed a few notable distinctions across patterns of mean differences in individually rated social skills (see Table 27 and Table 31). First, children characterized by the 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' profile group obtained the highest average rating in most individual social skills (i.e. communication, responsibility, self-control, cooperation, and empathy), while children characterized by the 'Negatively Emotionally Reactive and Dysregulated' profile group typically obtained the lowest average rating across individual social skills (i.e. communication, assertion, engagement, self-control, cooperation, and empathy). On parent-rated engagement, the 'Under Attuned to Subtlety and Dysregulated' profile type displayed the highest average rating, yet subsequent analysis confirmed that the 'Under Attuned to Subtlety and Dysregulated' group did not exhibit significantly greater ratings of engagement as compared to 'Exuberant and Dysregulated' and Positively Emotionally Reactive, Highly

Attuned to Subtlety, and Well-Regulated' profile groups. Similarly, children within the 'Exuberant and Dysregulated' profile group exhibited the highest average rating of parent-rated assertion, yet did not display significantly greater ratings of assertion as compared to 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' and 'Under Attuned to Subtlety and Dysregulated' profile types. With respect to parent-rated responsibility, the 'Under Attuned to Subtlety and Dysregulated' group demonstrated the lowest average rating, yet pairwise comparisons revealed that the 'Under Attuned to Subtlety and Dysregulated' profile only displayed significantly lower responsibility when compared to 'Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated' type. In fact, the 'Under Attuned to Subtlety and Dysregulated' profile group displayed notable differentiation in ratings across several individual social skills, reflecting higher ratings on outcome variables of communication, engagement, and assertion, and lower ratings on outcome variables of responsibility, self-control, cooperation, and empathy. Children characterized as 'Reserved and Regulated' also reflected observable variability in many individual social skills, demonstrating higher ratings on outcome variables of responsibility, self-control, and cooperation, and lower ratings on outcome variables of communication, engagement, and assertion.

Teacher-Rated Temperament Profiles on Social Functioning

When rated by teachers, temperament profile membership was significantly associated with concurrently assessed social skills (W (4, 127) = 85.25, $p < .001$, $r^2 = 0.41$). Kindergarten students' membership in teacher-rated temperament profiles demonstrated a large effect on the expression of overall social skills ($r^2 = 0.41$) (Cohen, 1988). Descriptive analysis revealed that Waldrip's (2023) 'Low to Average Reactive and Regulated' profile group demonstrated the highest average ratings of overall social functioning, while the 'Negatively Emotionally Reactive

and Dysregulated' profile group demonstrated the lowest average ratings of overall social functioning (see Table 28 and Figure 4). Subsequent post-hoc pairwise comparisons demonstrated additional nuance among mean differences in temperament profiles on teacher-rated social skills (see Table 26 and Table 29).

Following predictions regarding parent-rated profiles, it was hypothesized that 'Negatively Emotionally Reactive and Dysregulated' children would display lower overall teacher-rated social skills as compared to 'Exuberant and Regulated', 'Reserved and Regulated', 'Low to Average Reactive and Regulated', and 'Negatively Emotionally Reactive but Regulated' children (Hypothesis 2b). This hypothesis was supported, as children characterized by the 'Negative Emotionally Reactive and Dysregulated' profile group (M = 87.08, SD = 7.76) demonstrated the lowest average rating of overall social skills and differed significantly from all other teacher-rated profile groups. Conversely, 'Exuberant and Regulated' children were expected to display greater overall social functioning as compared to all other teacher-rated groups. This hypothesis was not supported. Pairwise comparisons revealed that children classified as 'Low to Average Reactive and Regulated' (M = 108.89, SD = 9.98) not only exhibited the highest average ratings of overall social skills but also demonstrated significantly greater social skills as compared to all other teacher-rated profile types. Instead, children classified as 'Exuberant and Regulated' (M = 104.26, SD = 10.26) demonstrated the second highest average rating of overall social functioning and displayed significantly greater social skills than children classified as 'Negatively Emotionally Reactive but Regulated' and Negatively Emotionally Reactive and Dysregulated'. Children characterized as 'Negatively Emotionally Reactive but Regulated' (M = 97.36, SD = 5.46) demonstrated generally lower ratings of overall social skills, but demonstrated significantly greater social skills than the

‘Negatively Emotionally Reactive and Dysregulated’ profile group. The ‘Reserved and Regulated’ profile group (M = 98.00, SD = 10.66) fell within the center of profile mean rankings and only displayed significant differences from ‘Low to Average Reactive and Regulated’ and ‘Negatively Emotionally Reactive and Dysregulated’ groups. Lastly, children characterized as ‘Negatively Emotionally Reactive and Dysregulated’ demonstrated the lowest average rating of overall social functioning and exhibited significantly lower social skills in comparison to all other teacher-rated profile groups.

Table 26

Outcomes of Teacher-Rated Profile Membership on Overall Social Skills

Original Predictions	Reordered Predictions	Actual Outcome	Profile Description of Actual Outcome
Exuberant and Regulated^{A} (31)	Low to Average Reactive and Regulated^{A} (48)	Low to Average Reactive and Regulated^{A} (47)	Mod. low exuberance; mod. high behavior regulation
Low to Average Reactive and Regulated^{B} (48)	Exuberant and Regulated^{A} (31)	Exuberant and Regulated^{B} (31)	Low internalizing emotion; mod. high exuberance and mod. high positive affect; mod. low levels of low intensity pleasure; mod. high emotion regulation
Reserved and Regulated^{B} (11)	Reserved and Regulated^{B} (11)	Reserved and Regulated^{BC} (11)	Low positive affect and low exuberance
Negative Emotionally Reactive but Regulated^{B} (22)	Negative Emotionally Reactive but Regulated^{B} (22)	Negative Emotionally Reactive but Regulated^{C} (22)	Mod. high internalizing emotion and mod. high anger
Negatively Emotionally Reactive and Dysregulated^{C} (12)	Negatively Emotionally Reactive and Dysregulated^{C} (12)	Negatively Emotionally Reactive and Dysregulated^{D} (12)	Low emotion regulation; high anger and high internalizing emotion; mod. low behavior regulation and mod. low positive affect

Note. Profiles are ordered from highest scoring to lowest scoring profiles. Profiles that share a subscript are not significantly different from one another. $\alpha = 0.05$.

Individual Social Skills

Due to lack of person-centered research on individual social skills, analyses of communication, cooperation, responsibility, empathy, assertion, engagement, and self-control were strictly exploratory. In the present sample of kindergarten students, temperament profile membership was significantly associated with concurrently assessed communication (W (4, 127) = 95.18, $p < .001$), cooperation (W (4, 127) = 66.40, $p < .001$), responsibility (W (4, 127) = 85.09, $p < .001$), empathy (W (4, 127) = 60.24, $p < .001$), assertion (W (4, 127) = 13.36, $p < .01$), engagement (W (4, 127) = 46.77, $p < .001$), and self-control (W (4, 127) = 117.37, $p < .001$). Kindergarten students' membership in teacher-rated temperament profiles demonstrated a large effect on the expression of communication ($r^2 = 0.39$), engagement ($r^2 = 0.29$), self-control ($r^2 = 0.39$) , cooperation ($r^2 = 0.40$), responsibility ($r^2 = 0.44$), and empathy ($r^2 = 0.27$); and a moderate effect on assertion ($r^2 = 0.11$) (Cohen, 1988). Post-hoc pairwise comparisons revealed several notable patterns of mean differences in individually rated social skills (see Table 28 and Table 31). First, children characterized by the 'Low to Average Reactive and Regulated' profile group obtained the highest average rating in most individual social skills (i.e. communication, responsibility, self-control, cooperation, and empathy), while children characterized by the 'Negatively Emotionally Reactive and Dysregulated' profile group obtained the lowest average rating in most individual social skills (i.e. communication, engagement, responsibility, self-control, cooperation, and empathy). On teacher-rated engagement, the 'Exuberant and Regulated' profile type exhibited the highest average rating, yet subsequent analysis confirmed that the 'Exuberant and Regulated' group did not significantly differ from 'Low to Average Reactive and Regulated' profile group. Similarly, children within the 'Exuberant and Regulated' profile group exhibited the highest average rating of parent-rated assertion but only demonstrated

significantly greater assertion as compared to children classified as ‘Reserved and Regulated’. While the ‘Reserved and Regulated’ group demonstrated the lowest average rating of teacher-reported assertion, children within this group generally reflected variability across individual social skills, displaying higher ratings on teacher-reported responsibility and cooperation, and lower ratings on engagement and assertion. Another notable pattern unique to teacher-rated social functioning is related to outcome variables such as responsibility, self-control, and empathy, in which there appear to be observable homogenous groups. In each of the aforementioned variables, children characterized as ‘Low to Average Reactive and Regulated’ display significantly greater ratings than children in all other profile groups. Conversely, children classified as ‘Negatively Emotionally Reactive and Dysregulated’ display significantly lower ratings than children in all other profile groups. Additionally, ‘Exuberant and Regulated’ and ‘Reserved and Regulated’ profile groups display no significant differences among one another on these variables. The final observable pattern that was identified across most individual social skills concerns the ‘Negatively Emotionally Reactive and Dysregulated’ and ‘Negatively Emotionally Reactive but Regulated’ profile groups, as children within these profiles demonstrated significant differences on teacher ratings of communication, engagement, responsibility, self-control, and empathy.

Table 27

Mean Comparisons Between Parent-Rated Profiles on Social and Behavioral Outcomes

	W	df	R^2	1[a]	2[b]	3[c]	4[d]	5[e]
Social Skills	52.39***	4, 128	.31	94.35 (9.94)	83.54 (8.13)	90.24 (10.07)	94.24 (11.02)	103.13 (11.18)
Communication	55.58***	4, 128	.27	16.29 (1.99)	13.77 (1.36)	14.38 (2.50)	15.45 (2.60)	17.18 (2.07)
Engagement	50.26***	4, 128	.34	16.24 (2.63)	11.23 (3.03)	11.29 (3.30)	15.42 (3.46)	15.38 (3.18)
Assertion	20.75***	4, 128	.12	14.76 (3.07)	12.38 (2.02)	13.33 (2.65)	15.08 (2.45)	14.83 (3.05)
Responsibility	30.15***	4, 128	.22	10.88 (2.71)	11.15 (1.41)	11.76 (2.53)	11.18 (2.25)	13.50 (2.29)
Self-Control	43.90***	4, 128	.29	10.00 (3.08)	8.46 (2.57)	10.90 (2.70)	10.03 (3.11)	13.05 (2.60)
Cooperation	45.83***	4, 128	.31	11.71 (2.17)	11.31 (2.10)	12.33 (2.50)	11.58 (2.07)	14.27 (2.01)
Empathy	18.51**	4, 128	.13	11.41 (2.79)	10.15 (3.18)	12.14 (3.61)	12.66 (3.79)	13.80 (2.92)
Externalizing	34.69***	4, 128	.26	9.76 (3.73)	10.15 (3.85)	7.76 (2.84)	9.18 (3.85)	5.65 (3.08)
Internalizing	15.58**	4, 128	.15	4.18 (2.94)	7.31 (3.35)	5.10 (2.70)	3.92 (2.96)	3.68 (2.81)
Hyperactivity/Inattention	30.12***	4, 128	.23	7.00 (2.26)	7.31 (2.36)	5.38 (1.66)	7.00 (3.12)	4.48 (2.41)
Bullying	13.22*	4, 128	.10	1.53 (1.77)	1.92 (1.71)	1.10 (1.26)	1.26 (1.62)	.58 (1.06)
Autism Spectrum	37.79***	4, 128	.30	8.06 (2.86)	14.38 (5.49)	12.10 (3.87)	9.03 (4.50)	7.17 (3.97)

Note. Cells contain class-specific means and (standard deviations). * $p < .05$ ** $p < .01$ *** $p < .001$. [a] Under Attuned to Subtlety and Dysregulated [b] Negatively Emotionally Reactive and Dysregulated [c] Reserved and Regulated [d] Exuberant and Dysregulated [e] Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated

Table 28

Mean Comparisons Between Teacher-Rated Profiles on Social and Behavioral Outcomes

	W	df	R^2	1[a]	2[b]	3[c]	4[d]	5[e]
Social Skills	85.25***	4, 127	.41	98.00 (10.66)	108.89 (9.98)	104.26 (10.26)	97.36 (5.46)	87.08 (7.67)
Communication	95.18***	4, 127	.39	15.09 (3.21)	17.67 (2.39)	17.39 (2.28)	14.86 (1.52)	12.92 (1.62)
Engagement	46.77***	4, 127	.29	13.64 (3.01)	16.26 (2.70)	17.26 (2.28)	14.82 (2.34)	12.50 (2.50)
Assertion	13.36**	4, 127	.11	10.27 (3.29)	13.51 (3.54)	13.94 (2.98)	13.14 (2.14)	11.75 (4.11)
Responsibility	85.09***	4, 127	.44	13.82 (3.03)	15.43 (2.42)	13.16 (2.53)	12.09 (1.72)	10.33 (1.72)
Self-Control	117.37***	4, 127	.39	13.36 (3.93)	15.85 (2.98)	14.26 (3.35)	12.14 (2.70)	8.92 (1.78)
Cooperation	66.40***	4, 127	.40	13.55 (2.81)	14.94 (2.67)	12.39 (2.82)	11.36 (2.30)	9.92 (2.07)
Empathy	60.24***	4, 127	.27	11.64 (2.54)	14.21 (2.62)	12.42 (3.25)	12.45 (2.09)	9.50 (1.73)
Externalizing	63.76***	4, 128	.40	5.55 (4.68)	2.54 (2.95)	5.87 (4.13)	7.27 (4.11)	10.67 (4.19)
Internalizing	59.33***	4, 128	.22	5.00 (2.90)	2.54 (2.74)	.90 (1.08)	3.77 (3.82)	4.42 (3.85)
Hyperactivity/Inattention	60.04***	4, 128	.41	4.36 (2.34)	2.85 (2.53)	6.32 (3.92)	6.27 (2.99)	9.33 (3.50)
Bullying	16.80**	4, 128	.14	1.73 (1.79)	.81 (1.32)	1.77 (2.04)	2.00 (1.95)	2.42 (1.83)
Autism Spectrum	46.13***	4, 128	.34	9.91 (5.07)	5.54 (3.92)	5.52 (4.16)	9.95 (3.54)	13.42 (5.79)

Note. Cells contain class-specific means and (standard deviations). * $p < .05$ ** $p < .01$ *** $p < .001$. [a] Reserved and Regulated [b] Low to Average Reactive and Regulated [c] Exuberant and Regulated [d] Negatively Emotionally Reactive but Regulated [e] Negatively Emotionally Reactive and Dysregulated

Table 29

Behavioral and Social Outcomes of Parent and Teacher-Rated Profiles

	Externalizing	Internalizing	Social Skills
Parent-Rated Profiles			
	Negatively Emotionally Reactive and Dysregulated^{A} (13)	Negatively Emotionally Reactive and Dysregulated^{A} (13)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{A} (40)
	Under Attuned to Subtlety and Dysregulated^{A} (17)	Reserved and Regulated^{AB} (21)	Under Attuned to Subtlety and Dysregulated^{AB} (17)
	Exuberant and Dysregulated^{A} (38)	Under Attuned to Subtlety and Dysregulated^{B} (17)	Exuberant and Dysregulated^{B} (38)
	Reserved and Regulated^{A} (21)	Exuberant and Dysregulated^{B} (38)	Reserved and Regulated^{BC} (21)
	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{B} (40)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{B} (40)	Negatively Emotionally Reactive and Dysregulated^{C} (13)
Teacher-Rated Profiles			
	Negatively Emotionally Reactive and Dysregulated^{A} (12)	Reserved and Regulated^{A} (11)	Low to Average Reactive and Regulated^{A} (47)
	Negative Emotionally Reactive but Regulated^{B} (22)	Negatively Emotionally Reactive and Dysregulated^{AB} (12)	Exuberant and Regulated^{B} (31)
	Exuberant and Regulated^{B} (31)	Negative Emotionally Reactive but Regulated^{AB} (22)	Reserved and Regulated^{BC} (11)
	Reserved and Regulated^{B} (11)	Low to Average Reactive and Regulated^{B} (48)	Negative Emotionally Reactive but Regulated^{C} (22)
	Low to Average Reactive and Regulated^{C} (48)	Exuberant and Regulated^{C} (31)	Negatively Emotionally Reactive and Dysregulated^{D} (12)

Note. Profiles are ordered from highest scoring to lowest scoring profiles. Higher scores indicate higher levels of problem behaviors and higher levels of social skills. Post hoc comparisons follow A > B > C > D. Profiles that share a subscript are not significantly different from one another. $\alpha = 0.05$.

Figure 3

Behavioral and Social Outcomes of Parent-Rated Profiles

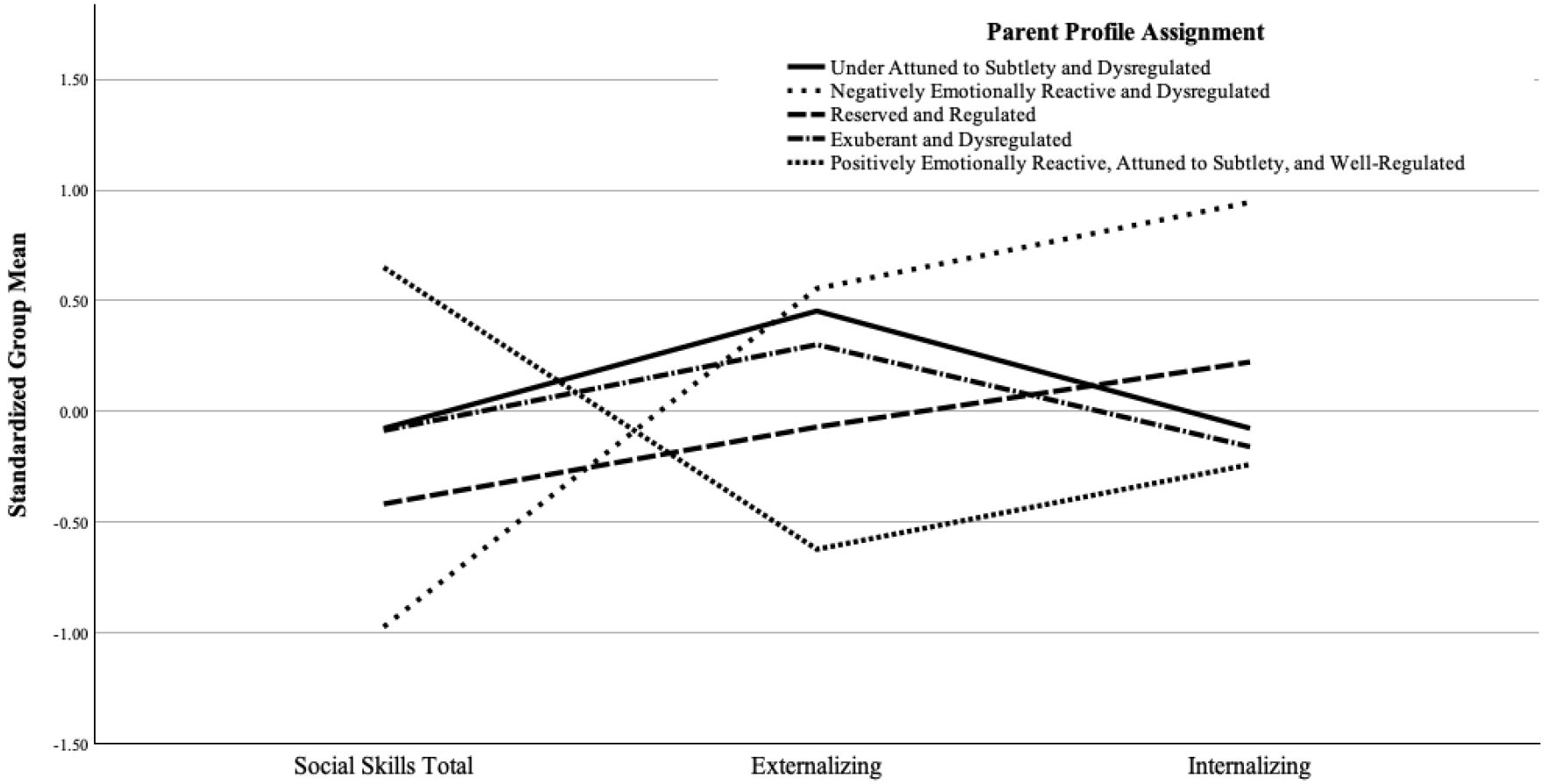

Figure 4

Behavioral and Social Outcomes of Teacher-Rated Profiles

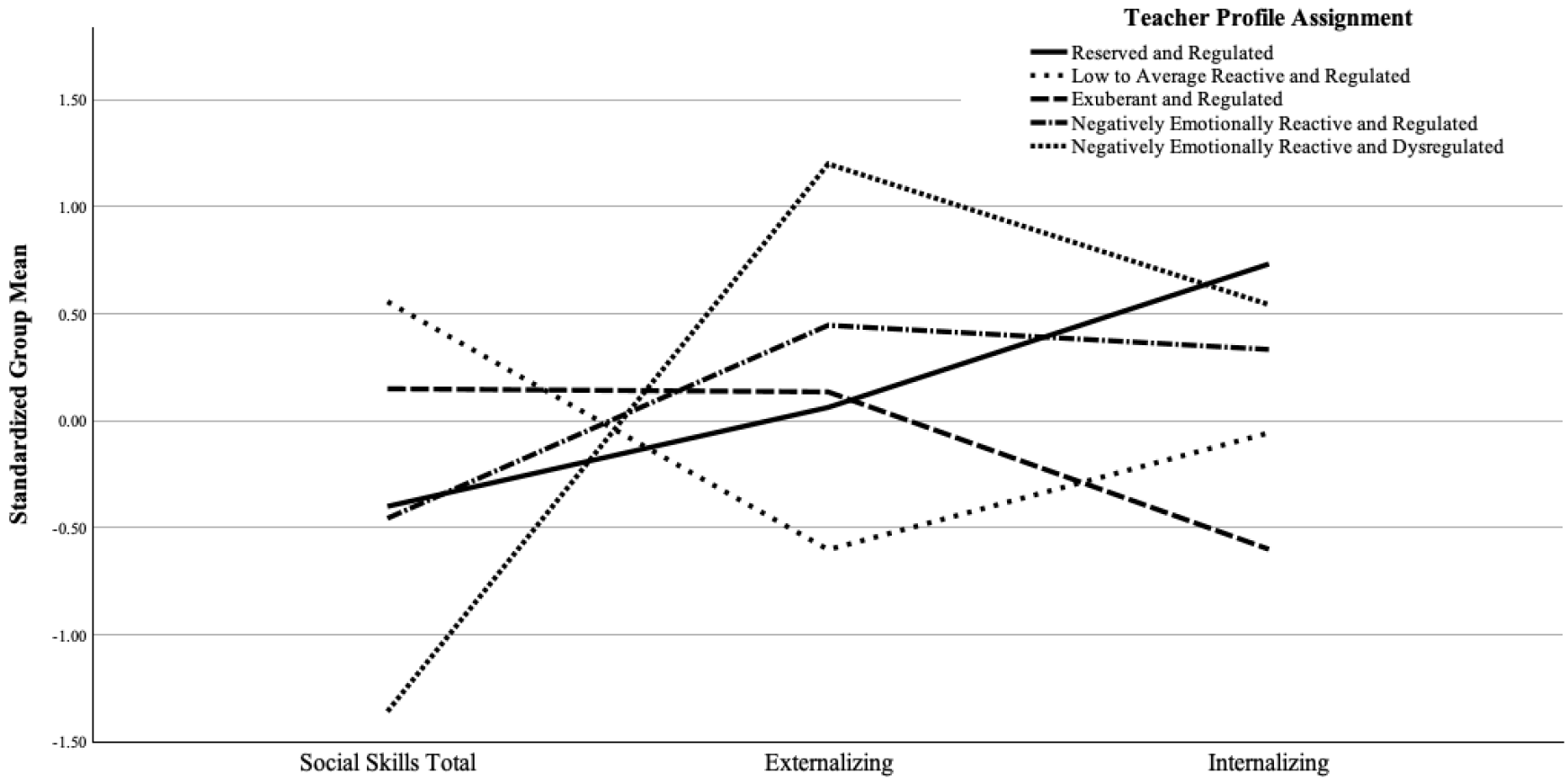

Table 30

Specific Behavioral Outcomes of Parent and Teacher-Rated Profiles

	Hyperactivity/Inattention	Bullying	Autism Spectrum Disorder
Parent-Rated Profiles			
	Negatively Emotionally Reactive and Dysregulated^{A} (13)	Negatively Emotionally Reactive and Dysregulated^{A} (13)	Negatively Emotionally Reactive and Dysregulated^{A} (13)
	Under Attuned to Subtlety and Dysregulated^{A} (17)	Under Attuned to Subtlety and Dysregulated^{A} (17)	Reserved and Regulated^{A} (21)
	Exuberant and Dysregulated^{A} (38)	Exuberant and Dysregulated^{A} (38)	Exuberant and Dysregulated^{B} (38)
	Reserved and Regulated^{AB} (21)	Reserved and Regulated^{AB} (21)	Under Attuned to Subtlety and Dysregulated^{B} (17)
	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{B} (40)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{B} (40)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{B} (40)
Teacher-Rated Profiles			
	Negatively Emotionally Reactive and Dysregulated^{A} (12)	Negatively Emotionally Reactive and Dysregulated^{A} (12)	Negatively Emotionally Reactive and Dysregulated^{A} (12)
	Exuberant and Regulated^{B} (31)	Negative Emotionally Reactive but Regulated^{A} (22)	Negative Emotionally Reactive but Regulated^{A} (22)
	Negative Emotionally Reactive but Regulated^{B} (22)	Exuberant and Regulated^{A} (31)	Reserved and Regulated^{A} (11)
	Reserved and Regulated^{C} (11)	Reserved and Regulated^{AB} (11)	Low to Average Reactive and Regulated^{B} (48)
	Low to Average Reactive and Regulated^{D} (48)	Low to Average Reactive and Regulated^{B} (48)	Exuberant and Regulated^{B} (31)

Note. Profiles are ordered from highest scoring to lowest scoring profiles. Higher scores indicate higher levels of problem behaviors and higher levels of social skills. Post hoc comparisons follow A > B > C > D. Profiles that share a subscript are not significantly different from one another. $\alpha = 0.05$.

Table 31

Specific Social Outcomes of Parent and Teacher-Rated Profiles

	Communication	Engagement	Assertion
Parent-Rated Profiles			
	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{A} (40)	Under Attuned to Subtlety and Dysregulated^{A} (17)	Exuberant and Dysregulated^{A} (38)
	Under Attuned to Subtlety and Dysregulated^{AB} (17)	Exuberant and Dysregulated^{A} (38)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{A} (40)
	Exuberant and Dysregulated^{B} (38)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{A} (40)	Under Attuned to Subtlety and Dysregulated^{AB} (17)
	Reserved and Regulated^{BC} (21)	Reserved and Regulated^{B} (21)	Reserved and Regulated^{BC} (21)
	Negatively Emotionally Reactive and Dysregulated^{C} (13)	Negatively Emotionally Reactive and Dysregulated^{B} (13)	Negatively Emotionally Reactive and Dysregulated^{C} (13)
Teacher-Rated Profiles			
	Low to Average Reactive and Regulated^{A} (47)	Exuberant and Regulated^{A} (31)	Exuberant and Regulated^{A} (31)
	Exuberant and Regulated^{A} (31)	Low to Average Reactive and Regulated^{A} (47)	Low to Average Reactive and Regulated^{A} (47)
	Reserved and Regulated^{BCD} (11)	Negative Emotionally Reactive but Regulated^{B} (22)	Negative Emotionally Reactive but Regulated^{A} (22)
	Negative Emotionally Reactive but Regulated^{C} (22)	Reserved and Regulated^{BC} (11)	Negatively Emotionally Reactive and Dysregulated^{AB} (12)
	Negatively Emotionally Reactive and Dysregulated^{D} (12)	Negatively Emotionally Reactive and Dysregulated^{C} (12)	Reserved and Regulated^{B} (11)

Note. Profiles are ordered from highest scoring to lowest scoring profiles. Higher scores indicate higher levels of problem behaviors and higher levels of social skills. Post hoc comparisons follow A > B > C > D. Profiles in the same subset are not significantly different from one another. $\alpha = 0.05$.

Table 31 *(continued)*

Specific Social Outcomes of Parent and Teacher-Rated Profiles

	Responsibility	Self-Control
Parent-Rated Profiles		
	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated[A] (40)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated[A] (40)
	Reserved and Regulated[B] (21)	Reserved and Regulated[B] (21)
	Exuberant and Dysregulated[B] (38)	Exuberant and Dysregulated[BC] (38)
	Negatively Emotionally Reactive and Dysregulated[B] (13)	Under Attuned to Subtlety and Dysregulated[BC] (17)
	Under Attuned to Subtlety and Dysregulated[B] (17)	Negatively Emotionally Reactive and Dysregulated[C] (13)
Teacher-Rated Profiles		
	Low to Average Reactive and Regulated[A] (47)	Low to Average Reactive and Regulated[A] (47)
	Reserved and Regulated[B] (11)	Exuberant and Regulated[B] (31)
	Exuberant and Regulated[B] (31)	Reserved and Regulated[BC] (11)
	Negative Emotionally Reactive but Regulated[B] (22)	Negative Emotionally Reactive but Regulated[C] (22)
	Negatively Emotionally Reactive and Dysregulated[C] (12)	Negatively Emotionally Reactive and Dysregulated[D] (12)

Note. Profiles are ordered from highest scoring to lowest scoring profiles. Higher scores indicate higher levels of problem behaviors and higher levels of social skills. Post hoc comparisons follow A > B > C > D. Profiles in the same subset are not significantly different from one another. $\alpha = 0.05$.

Table 31 *(continued)*

Specific Social Outcomes of Parent and Teacher-Rated Profiles

	Cooperation	Empathy
Parent-Rated Profiles		
	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{A} (40)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{A} (40)
	Reserved and Regulated^{B} (21)	Exuberant and Dysregulated^{AB} (38)
	Under Attuned to Subtlety and Dysregulated^{B} (17)	Reserved and Regulated^{ABC} (21)
	Exuberant and Dysregulated^{B} (38)	Under Attuned to Subtlety and Dysregulated^{BC} (17)
	Negatively Emotionally Reactive and Dysregulated^{B} (13)	Negatively Emotionally Reactive and Dysregulated^{C} (13)
Teacher-Rated Profiles		
	Low to Average Reactive and Regulated^{A} (47)	Low to Average Reactive and Regulated^{A} (47)
	Reserved and Regulated^{AB} (11)	Negative Emotionally Reactive but Regulated^{B} (22)
	Exuberant and Regulated^{BC} (31)	Exuberant and Regulated^{B} (31)
	Negative Emotionally Reactive but Regulated^{CD} (22)	Reserved and Regulated^{B} (11)
	Negatively Emotionally Reactive and Dysregulated^{D} (12)	Negatively Emotionally Reactive and Dysregulated^{C} (12)

Note. Profiles are ordered from highest scoring to lowest scoring profiles. Higher scores indicate higher levels of problem behaviors and higher levels of social skills. Post hoc comparisons follow A > B > C > D. Profiles in the same subset are not significantly different from one another. $\alpha = 0.05$.

Chapter 5: Discussion

Temperament is regarded as the impetus of children's early reactions to the environment, and such mechanisms heavily influence children's ability to appraise and adapt to environmental change. As temperament plays a critical role in early childhood development, several scholars within the field have made a concerted effort to understand the conceptualization and measurement of temperament, with the aim of uncovering temperament's relation to a number of developmental and behavioral outcomes. Over time, certain temperamental characteristics have been identified as predictors of children's social behavior as reported by informants in various contexts (i.e. parents, peers, and teachers). The extant literature on children's social development suggests an interactive relationship between temperamental processes of reactivity and regulation on social-developmental outcomes like social functioning and problem behavior (Sanson et al., 2011). However, such patterns were found using variable-centric methodology, which likely obscured important nuance and complexity regarding how various temperamental characteristics interact in their association with social behavior. Person-centered or profile-based approaches, on the other hand, capture greater nuance in social development by identifying subgroups or profiles of children who are not only similar on particular temperament traits but also exhibit similar patterns of relationships among such traits (Laursen & Hoff, 2006). Despite obvious advantages of person-centric methodology, very few studies to date have utilized profiles to explicate the relations between temperament and social developmental outcomes. Additionally, person-centered research reviewed thus far has mostly investigated broad social developmental outcomes with little consideration for the context of such behaviors. For instance, few studies have accounted for the influence of temperament on adjustment across multiple contexts, such as in relationships with parents (Van den Akker, 2010), in friendships with peers (Laible et al.,

2014), or in a highly structured classroom environment (Sanson et al., 2009). Therefore, the main purpose of the present study was to contextualize temperament profiles formerly generated from the current dataset within the broader anthology of profile-based research and to relate such profiles to children's social functioning and problem behavior across multiple contexts. The current study extends the work of Waldrip (2023), who identified temperament profiles of the children in this sample from the distinct perspectives of parents and teachers.

Using cutting-edge analytical techniques, the current study examined whether children with different constellations of temperament characteristics differed on ratings of behavior problems and social functioning in both home and school environments. Temperament profile membership and social behavior were analyzed separately for both parent and teacher perspectives, and comparisons of social-developmental outcomes were examined for profiles that comprised more than 5% of the present sample. To examine the relationship between temperament profile membership and concurrent internalizing problem behaviors, externalizing problem behaviors, and social skills, multiple iterations of the modified BCH procedure (Vermunt, 2010) were performed. Wald's chi-squared, pairwise comparison tests were then implemented to explore how different temperamental groups diverged in their expression of problem behaviors and social functioning. Several psychosocial outcomes were considered, including problem behaviors such as bullying, hyperactivity/inattention, and Autism Spectrum Disorder-related behavior, as well as specific social skills in the areas of communication, cooperation, responsibility, empathy, assertion, engagement, and self-control. The results of the present study were commensurate with patterns found in existing literature regarding the complex influence of temperament on social developmental outcomes. However, findings did provide novel insight into unique combinations of temperament characteristics that, to the

author's knowledge, had not been explored within person-centered models before. These findings and other relevant patterns identified within the current study's results are discussed in further detail below.

Before presenting key findings, a slight constraint of the present study must first be acknowledged. In the enumeration and labeling of the current study's temperament profiles, Waldrip (2023) utilized a naming convention that assigned shortened labels to each identified profile. While the assignment of brief profile labels allowed Waldrip to better facilitate discussion and comparison of the various temperament profiles, several of the identified profiles did not fit neatly into a classification system. As the purpose of the current study was to demonstrate the complexity of temperament development, full profile descriptions were presented to fully capture the temperamental differences among profile groups (see Table 4 and Table 5). When reviewing the present study's results and considering implications of key findings, readers are encouraged to pay close attention, not just to the label of each profile, but to the collection of temperamental characteristics that make up the profile. Generalized naming conventions are commonly utilized in person-centered models, as some temperament-related terminology may be difficult for laypeople to understand (i.e. surgency, low intensity pleasure, exuberance) (Maine et al., 2024). However, an unobscured representation of children's individual differences is warranted to effectively support caregivers and educators in promoting children's social-emotional development. Therefore, Waldrip's (2023) shortened labels will be substituted with full profile descriptions in following analysis and interpretation of the current study's results.

Behavioral Outcomes of Parent and Teacher-Rated Profiles of Temperament

In alignment with previous research, the results of the present study revealed a significant relationship between temperament profile membership and concurrent problem behaviors, as children who were classified into different temperament groups diverged in their expression of externalizing and internalizing problem behaviors. Within both home and school settings, children's temperament classification demonstrated a large effect on the expression of externalizing problem behaviors, though only demonstrated a moderate effect on the expression of internalizing problem behaviors. This finding was commensurate with previous research, which suggested that impressions of children's internalizing behaviors may be obscured by disruptive behaviors such as impulsivity or aggressiveness (Major et. al, 2015). As such, internalizing behaviors such as social withdrawal or anxiety may be frequently overlooked by caregivers and educators. Nevertheless, temperament profile membership was still significantly associated with children's internalizing problem behaviors from both parent and teacher perspectives. With respect to more specific problem behaviors, such as hyperactivity/inattention and Autism Spectrum-related behavior, effect sizes proved to be relatively strong. Children's temperament profile membership did not, however, demonstrate a large effect on bullying behavior in both home and school settings. Although bullying certainly occurs as early as kindergarten, it may be difficult to distinguish bullying behavior from developmentally appropriate noncompliance and aggression at this age (Korsch & Petermann, 2014).

Overall, teacher ratings on behavioral outcomes demonstrated relatively larger effect sizes, especially on ratings of externalizing problem behavior and hyperactivity/inattention. Educators have the advantage of observing large groups of children at one time and are often exposed to a larger spectrum of developmental behavior. Therefore, educators may be more apt

to have a normative reference point for their ratings. Although teachers regularly observe children's social interactions within a larger group context, their impression of children's behaviors are not necessarily superior. Rather, differences across parent and teacher perspectives can be attributed to differences in situational demands of each unique environment and to differences in the relationship with the child. As previously mentioned, children's social adjustment is influenced by much more than temperament itself but by the congruence between children's temperament characteristics and context-specific expectations (Renk, 2005). Therefore, the following findings elucidate the way in which different combinations of temperament uniquely influence children's problem behavior in the home and school environment.

Parent-Rated Externalizing Problem Behaviors

In the present sample, children rated by caregivers as moderately low in anger, moderately low in low intensity pleasure, moderately high in soothability, moderately high in behavior regulation, and moderately high in positive affect displayed significantly less externalizing problem behaviors than children of *all* other parent-rated groups. This result was largely supported by the extant literature, as children within this group were uniquely distinguished by lower anger, greater behavioral regulation, and greater receptiveness to external sources of emotional regulation (i.e. soothability). It was surprising, however, that children of all other profile groups displayed *no* significant differences from one another on the expression of externalizing behaviors. Previous research has suggested that high negative emotionality and high activity predict externalizing behaviors, but only when such characteristics are paired with low levels of behavioral regulation and soothability (Sanson et al., 2004; Rothbart & Bates, 2006). Therefore, children with profiles marked by emotional reactivity and weaker self-

regulatory ability (i.e. behavior regulation and soothability) were expected to display greater externalizing behaviors. In the current sample, the group of children with the highest average rating of externalizing problem behaviors was characterized by low behavioral regulation and soothability, as well as *moderately* high levels of negative emotionality. Similarly, the group of children with the second highest rating of externalizing problem behaviors was characterized by *moderately* high negative emotionality, *moderately* high activity, *moderately* low behavior regulation, moderately low soothability. It is possible that temperament profile membership is only significantly associated with externalizing problem behaviors in the presence of simultaneously extreme levels of negative emotionality, activity, behavioral regulation, soothability, and other dimensions of temperament (i.e. perceptual sensitivity). However, as the current study remains one of the only empirical investigations to incorporate such a wide range of temperamental characteristics into the development of temperament profile models, additional research is warranted in order to make further claims on this matter.

Another notable finding of the current study showed that children characterized by low perceptual sensitivity, moderately low negative emotionality, and moderately low soothability demonstrated similar, if not greater, externalizing problem behaviors than children distinguished by moderately high negative emotionality, moderately high activity, moderately low behavior regulation, and moderately low soothability. Even with below average negative affectivity, children marked by extremely low perceptual sensitivity were rated similarly to children with greater emotional reactivity and weaker self-regulation (i.e. behavioral regulation and soothability). This finding may demonstrate the unique contribution of perceptual sensitivity in the development of externalizing problem behaviors. While empirical investigation of individual differences in perceptual sensitivity *alone* has been mixed (Pollak et al., 2009), children who

display lower perceptual sensitivity may be less skilled at detecting internal or external cues, making it more difficult to emotionally regulate after a particularly stressful event. Thus, associations between perceptual sensitivity and problem behavior may suggest a more complex relationship maintained by emotional regulation or soothability.

The final notable finding demonstrated that children characterized by low exuberance and positive affect did *not* significantly differ from children in almost all other profile groups. While this finding did not support initial predictions, it may support the notion that low positive affectivity is expressed in ways that appear similar to high negative emotionality, even though these dimensions are independent of each other (Shankman et al., 2005). Regardless, children within this group still exhibited a lower mean rating on externalizing problems when compared to almost all remaining profile groups.

Parent-Rated Internalizing Problem Behaviors

A similar but inverse pattern of differences emerged when examining the relationship between temperament profile membership and parent-rated internalizing behaviors. In line with initial predictions, children characterized by a combination of low behavioral regulation and soothability, low positive affect, low levels of low intensity pleasure, moderately low perceptual sensitivity, and moderately high levels of negative emotionality displayed significantly greater internalizing problem behaviors than children in *all but one* other profile group. This finding was supported by the extant literature, which suggests that extreme levels of perceptual sensitivity (*high or low*), high inhibition, and high negative emotionally relate to greater internalizing behavior concerns, especially when paired with lower levels of soothability (Sanson et al., 2004). There was, however, no difference between this group and the group characterized by low

exuberance and low positive affect. This finding may indicate that low positive affect and low exuberance, when combined, underlie parent-rated internalizing behavior.

One finding that marginally supported the current study's original hypotheses demonstrated that children characterized by high inhibition and low positive affectivity did *not* significantly differ in their level of internalizing problem behaviors from children who demonstrated low levels of positive affectivity, moderately high negative emotionality, and low soothability. This was likely due to the profiles' shared temperamental quality of low positive affectivity. Previous research regarding individual differences in reactivity and regulation suggest that stronger emotional regulatory ability, such as soothability (an *external* source of emotional regulation), mitigate the impact of temperamental reactivity on internalizing problem behaviors (White et al., 2011; Evans et al., 2012). The subtle differences among each profile's characteristics may provide justification for the pattern of results evident in the current study's examination of internalizing problem behaviors. This finding may also suggest that even in the presence of high inhibition, an average level of soothability can be somewhat protective in the development of internalizing problem behaviors. Perhaps, the reasoning previously applied to the pattern of findings on children's expression of externalizing behaviors can also be applied to findings related to internalizing problem behaviors. It may be possible that temperament profile membership is only associated with internalizing problem behaviors in the presence of simultaneously extreme levels of negative emotionality, inhibition, *and* soothability. It could also be possible that internalizing problem behaviors are difficult to detect, regardless of setting. Internalizing problem behaviors may need to become more clinically extreme or maladaptive before a parent accurately appraises their child's behavior as internally oriented (Major et al., 2015).

Parent-Rated Bullying, Hyperactivity/Inattention, and Autism Spectrum Disorder

In exploring the association between temperament profile membership and specific problem behaviors, the results almost completely replicated key findings demonstrated by parents' ratings of externalizing problem behaviors. On outcome variables of hyperactivity/inattention and bullying, children characterized by moderately low levels of anger and low intensity pleasure, as well as moderately high levels of soothability, behavior regulation, and positive affect demonstrated significantly fewer problem behaviors than children in *all but one* other profile group that was characterized by low exuberance and low positive affect. Apart from the aforementioned finding, *no* other significant differences were found regarding the expression of hyperactivity/inattention and bullying behaviors.

In accordance with earlier interpretations, these results may either reflect the complexity inherent in the person-centered methodology of the current study or may alternatively reflect the difficulty of measuring hyperactivity/inattention and bullying in a context with limited opportunities to observe such specific types of behaviors. While most profile groups did not significantly differ from one another on these variables, it is still important to note that children characterized by extremely low perceptual sensitivity and moderately low levels of low intensity pleasure, internalizing emotion, and soothability displayed higher group averages of hyperactivity/inattention and bullying than children marked by moderately low behavior regulation and moderately high exuberance, positive affect, and anger. As previously discussed, results such as these demonstrate the unique contribution of perceptual sensitivity in the expression of externalizing problem behaviors, hyperactivity/inattention, and bullying within the home setting.

In regard to Autism Spectrum Disorder-related behaviors, the pattern of results appeared to be quite consistent with the extant literature. With the addition of social skills in the estimation of Autism Spectrum Disorder-related behaviors, the group of children characterized by a combination of low behavioral regulation and soothability, low positive affect, low levels of low intensity pleasure, moderately low perceptual sensitivity, and moderately high levels of negative emotionality demonstrated the highest average rating of Autism Spectrum Disorder-related behaviors but were *not* significantly different from children who were low in exuberance and low in positive affect. This finding is likely due to the latter group's high level of behavioral inhibition, which has been known to assert a differential impact on social functioning and problem behaviors within the existing literature (Dollar et al., 2017).

Teacher-Rated Externalizing Problem Behaviors

Investigation of temperament profile membership on teacher-reported externalizing problem behaviors corroborated previous empirical claims, as children characterized by high negative affectivity, low soothability, moderately low behavioral regulation, and moderately low positive affect exhibited greater externalizing problem behaviors as compared to children characterized by *all* other profile types. This pattern was especially noteworthy, as it supported the importance of self-regulation (i.e. behavior regulation and soothability) in the expression of externalizing problem behaviors (Rothbart & Bates, 2006).

Another important finding regarded the profile group comprised of children low in internalizing emotion (fear and sadness) and moderately low in low intensity pleasure, as well as moderately high in exuberance, positive affect, and soothability. Contrary to initial predictions, children within this group did *not* exhibit the fewest externalizing problem behaviors. Instead, children characterized by moderately low exuberance and moderately high behavior regulation

displayed significantly less externalizing problem behaviors than children of *all* other profile types. Although this finding was divergent from the current study's prior hypotheses, these results were not necessarily discrepant with existing theoretical underpinnings. Previous research suggests that children characterized by high exuberance demonstrate greater impulsivity and risk-taking behavior, especially if such children lack sufficient self-regulatory abilities (Eisenberg et al., 2000). In the current study, children of the profile group characterized by low internalizing emotion, moderately high exuberance, and moderately high soothability did *not* display greater than average behavior regulation (attentional focusing and inhibitory control). On the contrary, children of the profile group with the fewest externalizing problem behaviors displayed moderately low exuberance *in addition to* moderately high behavior regulation.

Behavioral regulation, in particular, has been established as a mitigating agent in the development of externalizing problem behaviors, especially for children who are already predisposed to high levels of emotional reactivity or activity (White et al., 2011; Dollar et al., 2017). Thus, subtle differences in the typology of self-regulation may have a greater implication on the estimation of externalizing problem behaviors than initially thought. The previous finding demonstrates the importance of preserving complexity when examining different combinations of temperamental reactivity and regulation. Simply conveying general regulatory characteristics may not sufficiently communicate the unique contribution of behavior regulation as opposed to emotion regulation on children's social development. Although characteristics of exuberance and negative affectivity appeared to have played an important role in the differentiation of temperament profiles on teacher-rated externalizing problem behaviors, children's behavioral regulation seemed to assert much more of an influence. In the current study, the measurement of behavioral regulation comprised temperament dimensions of attentional focusing and inhibitory

control. In future person-centered research, it may be advantageous to disaggregate such variables, as existing variable-centric research has shown the distinctive influence of attentional focusing and inhibitory control on both externalizing and internalizing problem behaviors (White et al., 2011).

Teacher-Rated Internalizing Problem Behaviors

In the current study, kindergarten students' exuberance also appeared to play a central role in the relationship between temperament profile membership and *teacher-reported* internalizing behaviors. Despite their average regulation, children characterized by substantially low exuberance and low positive affect were expected to display greater internalizing problem behaviors as compared to children in *all* other temperament profile groups. In line with initial predictions, children within this group demonstrated greater internalizing problem behaviors than children of the group characterized by moderately low exuberance and moderately high behavior regulation, as well as the group distinguished by low internalizing emotion, moderately low levels of low intensity pleasure, moderately high exuberance, moderately high positive affect, and moderately high soothability. However, children within this group did *not* demonstrate significantly greater internalizing behaviors than children within groups primarily marked by higher levels of negative emotionality. This finding substantiated previous research, which has asserted the predictive value of high negative emotionally in the development of internalizing problem behaviors (Sanson et al., 2004; Gartstein et al., 2016).

It is notable, however, that children within the group characterized by moderately low exuberance and moderately high behavior regulation demonstrated *no* significant differences from children within two profile groups both marked by higher negative emotionality. The first group of children was characterized by low soothability, high anger, high internalizing emotion,

moderately low behavior regulation, and moderately low positive affect, whereas the second group demonstrated moderately high internalizing emotion, moderately high anger, and otherwise average behavior regulation and soothability. This finding may be explained by the unique collection of temperament characteristics that distinguished such profile types. As reflected in previous research, children who exhibit inhibition or low levels of exuberance demonstrate increased risk of developing internalizing problem behaviors (Gartstein et al., 2016). However, stronger emotional regulatory ability, such as soothability (an *external* source of emotion regulation), have been known to mitigate the impact of inhibition on ratings of internalizing problem behaviors (White et al., 2011; Evans et al., 2012), Although children of the profile group distinguished by moderately low exuberance and moderately high behavioral regulation demonstrated appropriate self-regulatory abilities, such temperamental characteristics may not have promoted the same mitigating influence on the expression of internalizing problem behaviors as a characteristic such as soothability. Similar to patterns detected on teachers' ratings of externalizing problem behaviors, this finding suggests that subtle differences in the typology of self-regulation assert greater influence on the estimation of internalizing problem behaviors than initially believed. This reoccurring theme in the present study's results gives credence to the call for future person-centered research to incorporate a wider range of individual temperamental characteristics, including fine-grained regulatory traits that are often understudied.

Lastly, children of the profile group described by low internalizing emotion and moderately low levels of low intensity pleasure, as well as moderately high exuberance, positive affect, and soothability exhibited the lowest level of internalizing behaviors as compared to *all* other teacher-rated groups. This finding was commensurate with the extant literature on the development of internalizing problem behaviors, as such children were primarily characterized

by low internalizing emotion, moderately high levels of exuberance, *and* moderately high soothability (Sanson et al., 2004). Altogether, exuberance appeared to be more salient in the expression of internalizing problem behaviors when observed within the school environment. Characteristics of negative emotionality and soothability still appeared to be influential, but children's exuberance (i.e. activity, approach, high intensity pleasure, shyness) and positive affect promoted greater differentiation among teacher-rated temperament profiles.

Teacher-Rated Bullying, Hyperactivity/Inattention, and Autism Spectrum Disorder

In examining the association between temperament profile membership and specific problem behaviors as reported by *teachers,* several interesting findings emerged on outcome variables such as hyperactivity/inattention, bullying, and Autism Spectrum Disorder-related behaviors. In particular, there appeared to be noticeable differentiation among temperament profiles on students' expression of hyperactivity/inattention. With respect to the association between temperament profile membership and hyperactivity/inattention, existing literature has been very limited. On the other hand, a large body of variable-centric research has shown that children characterized by high activity levels, intensified negative emotionality, low attentional focusing, and poor inhibitory control tend to exhibit higher rates of hyperactivity, inattention, and diagnoses of Attention Deficit Hyperactivity Disorder (ADHD) (see Joseph et al., 2023 for review).

In the present study, children distinguished by high negative emotionality, moderately low behavior regulation, and low soothability demonstrated significantly greater hyperactivity/inattention as compared to children characterized by *all* other teacher-rated groups. Additionally, children within the profile group marked by high negative affectivity, moderately high exuberance, and moderately high soothability and the profile group characterized by

moderately high negative affectivity demonstrated greater hyperactivity/inattention than children in all remaining profile groups, though such groups did *not* display significant differences from one another. This finding accords with previous variable-centric findings, as children within the three aforementioned profile groups generally demonstrated higher negative affectivity, poorer self-regulatory abilities (behavioral regulation or soothability), or a combination of both. The extant literature also implies that greater self-regulatory abilities promote greater attention to situational demands, further suggesting that children's self-regulation impacts the presence of problem behaviors such as hyperactivity/inattention (Rothbart & Bates, 2006). In the present study, children marked by high negative affectivity, moderately high exuberance, *and* moderately high soothability demonstrated levels of hyperactivity/inattention that were similar to children of the profile group characterized *only* by moderately high negative affectivity. Perhaps, in the presence of high negative emotionality and exuberance, a slightly greater degree of emotional regulation or soothability can be somewhat protective in the development of hyperactivity/inattention symptomology. Though, without intensified negative affectivity, a greater level of emotional regulation may not be required. It is important to note that the extant literature explicitly identified behavioral regulation (attentional focusing and inhibitory control) as protective, as opposed to soothability. It may also be possible that, for kindergarten students, negative emotionality is more predictive of hyperactivity/inattention symptomology when accompanied by lower levels of soothability. As previously mentioned, specific problem behaviors may be more difficult to detect at this age, as teachers may not have sufficient opportunities to detect impairment in social and academic functioning typically preceding concerns of hyperactivity/inattention or bullying (Major et al., 2015).

In regard to temperament profile membership and bullying behavior, findings mirrored those previously identified in the current study's investigation of bullying behavior as reported by caregivers. Children characterized by moderately low exuberance and moderately high behavior regulation demonstrated significantly fewer bullying behaviors than children in *all but one* other profile group marked by low exuberance and low positive affect. In accordance with earlier interpretations, this finding may reflect an overall lack of bullying behavior expressed by young children in kindergarten. As previously mentioned, it is likely difficult for both educators and caregivers to distinguish bullying behavior from developmentally appropriate noncompliance and aggression at this age (Korsch & Petermann, 2014).

The last notable finding concerned teachers' impressions of children's Autism Spectrum Disorder-related behavior. Given the addition of social skills in the estimation of Autism Spectrum Disorder-related behaviors, children of the profile group characterized by moderately low exuberance and moderately high behavior regulation and children of the profile group characterized by high negative affectivity, moderately high exuberance, and moderately high soothability demonstrated significantly fewer Autism Spectrum Disorder-related behaviors than *all* other groups, though they did *not* demonstrate a significant difference from one another. Additionally, children high in negative affectivity, moderately low in behavior regulation, and low in soothability displayed the highest group average of Autism Spectrum Disorder-related behaviors, though they did *not* significantly differ from children within the profile group characterized by moderately high negative affectivity or the profile group distinguished by low exuberance and positive affect. These patterns may be interpreted in light of variable-centered research regarding temperamental correlates of Autism Spectrum Disorder (ASD). In a review of recent literature, Mallise and colleagues (2020) found that a combination of low soothability, low

inhibitory control, low attentional focusing, high perceptual sensitivity, low positive affect, and low exuberance were associated with a diagnosis of Autism Spectrum Disorder in early childhood. The results of the current study seemed to align with such research, yet the presence of any one of these characteristics led to higher ratings on this outcome variable. As previously mentioned, it may be possible that the aforementioned finding reflects the context of the current study, such that there are limited opportunities to observe Autism Spectrum Disorder-related behaviors in a non-clinical sample of kindergarten students.

Key Findings on Parent and Teacher-Rated Problem Behaviors

To summarize key findings regarding problem behaviors associated with temperament profile membership as rated by *both caregivers and teachers*, higher levels of exuberance, greater negative emotionality, and lower behavioral regulation and soothability contributed to increased externalizing behavior concerns, whereas lower levels of exuberance, greater negative emotionally, lower soothability, and lower perceptual sensitivity contributed to greater internalizing behavior concerns. These findings were largely supported by the extant literature, as most person-centered models associated with social-developmental outcomes tended to support the finding that children characterized by high approach, high negative emotionality, and low behavioral control display greater externalizing behavior (Aksan et al., 1999; Janson & Mathiesen, 2008), whereas children characterized by high shyness and high negative emotionality display greater internalizing behavior (Sanson et al., 2009). In regard to teachers' impressions of the relationship between temperament profile membership and problem behavior in the school environment, students' low level of exuberance seemed to display a central role in the differentiation of profile groups, especially when it came to the expression of internalizing problem behaviors. With respect to caregivers' impressions of the relationship between

temperament profile membership and problem behavior in the home environment, negative emotionality appeared to be salient in the differentiation of profile groups, especially when paired with substantially low perceptual sensitivity and lower self-regulatory ability (i.e. soothability and behavioral regulation). In fact, perceptual sensitivity was a characteristic that uniquely influenced parents' ratings of overall problem behaviors. This finding was particularly notable because, to the author's knowledge, no other person-centered study had previously considered the distinctive contribution of perceptual sensitivity in the differentiation of temperament profiles on psychosocial outcomes. Existing variable-centered research has suggested that children who display lower perceptual sensitivity may be less skilled at detecting internal or external cues, making it more difficult to emotionally regulate after a particularly intense anxiety-provoking event (Pollak et al., 2009). Although not as closely examined in association with externalizing problem behavior, links between perceptual sensitivity and problem behaviors suggest a more complex relationship maintained by emotional regulation or soothability. Thus, future research should further investigate the unique contribution of perceptual sensitivity in combination with various other temperament characteristics on various developmental outcomes.

The specific *type* of self-regulation seemed to have greater implications on the estimation of overall problem behaviors than initially believed. With respect to the development of internalizing behaviors, soothability, which refers to responsiveness to external sources of emotional regulation, appeared to be more protective than behavioral regulatory abilities, conceptualized as effortful control (inhibitory control and attentional focusing). This finding demonstrates the importance of preserving complexity when examining different combinations of temperamental reactivity and regulation. Simply conveying general regulatory characteristics

may not sufficiently communicate the unique contributions of effortful behavior regulation and external sources of emotion regulation on young children's social development. In future person-centered research, it may even be advantageous to further disaggregate behavior regulation, as existing variable-centric research has shown the distinctive influence of attentional focusing and inhibitory control on both externalizing and internalizing problem behaviors (White et al., 2011).

Regarding the association between temperament profiles and specific problem behaviors such as bullying, hyperactivity/inattention, and Autism Spectrum Disorder-related behavior, the findings of the present study were mixed. There *did* appear to be noticeable differentiation among teacher-rated temperament profiles on students' expression of hyperactivity/inattention. The results of such examination were consistent with previous variable-centric research, implicating the contributions of high activity levels, intensified negative emotionality, low attentional focusing, and poor inhibitory control to higher rates of hyperactivity and inattention (Joseph et al., 2023). However, on all other specific problem behaviors, caregiver and educator impressions demonstrated minimal differentiation among temperament profiles. This finding likely reflects the difficulty of measuring hyperactivity/inattention, bullying, and Autism Spectrum Disorder-related behaviors in a non-clinical sample of young kindergarten students. Particularly for caregivers, it may be challenging to rate hyperactivity/inattention, bullying, and Autism Spectrum Disorder-related behaviors in a context with limited normative peer comparisons and with few opportunities to observe such types of behaviors in a highly structured environment with increasing attentional demands (Korsch & Petermann, 2014; Major et al., 2015).

Social Outcomes of Parent and Teacher-Rated Profiles of Temperament

In alignment with the extant literature on children's temperament and social behavior (Eisenberg et al., 2006), results of the current study demonstrated significant relations between temperament profile membership and concurrent social functioning, such that children who were classified by different temperamental groups diverged in their expression of overall social skills. Within both home and school settings, children's temperament profile classification demonstrated a large effect on social functioning, with larger effect sizes demonstrated by teachers across ratings on *all* social outcome variables. With respect to children's individual social skills, parents' impressions of social functioning exhibited a smaller effect on assertion and empathy but demonstrated a larger effect on cooperation and engagement. Relatedly, teachers' impressions of social functioning displayed a smaller effect on assertion, but demonstrated a larger effect on responsibility, cooperation, communication, and self-control. As previously discussed, such differences among informant impressions are likely explained by the distinct contextual demands of both home and school environments (De Los Reyes et al., 2013). Beginning elementary school can be especially challenging for young children, as this transition coincides with increased academic demands, navigation of a new physical environment, pressure to meet new peers, and higher expectations for self-regulation (Rudasill & Konold, 2008). Additionally, educators receive the opportunity to observe children for long periods of time in a larger social context, which gives them unique access to specific aspects of children's early social development. As such, the following findings elucidate the influence of a few distinct combinations of temperamental characteristics on social adjustment in both home and school settings.

Parent-Rated Social Skills

As reported by caregivers, children characterized as moderately low in anger, moderately low in low intensity pleasure, moderately high in soothability, moderately high in behavior regulation, and moderately high in positive affect displayed significantly greater overall social skills as compared to *almost all* other parent-rated groups. This result was supported by the extant literature, which that suggests that a combination of low negative emotionality, high behavioral regulation, and greater soothability predict more effective social behavior in childhood (Eisenberg et al., 2006; Laible et a;., 2014). It was surprising, however, that children within this group did *not* demonstrate significantly greater social skills than children within the profile group marked by low levels of perceptual sensitivity, moderately low internalizing emotion (fear and sadness), and moderately low soothability. Previous research has suggested that extreme levels of perceptual sensitivity, high negative emotionality, and low self-regulation predict lower social skills (Eisenberg et al., 2006). As such, children characterized by these traits were expected to display weaker overall social skills as compared to children in remaining profile groups. Although these findings were not expected, they may not be entirely inconsistent from existing theory.

A small, yet growing, number of studies have focused on the impact of perceptual sensitivity on children's prosocial behavior. Although key findings appear to be generally varied, existing literature suggests that children who exhibit low levels of perceptual sensitivity tend to overlook internal and external cues during social interactions (Evans et al., 2012). Whereas low situational awareness may disrupt adaptive social functioning to some extent, children who are unaware of subtle environmental cues may not become as easily overwhelmed by anxiety-inducing social interactions. Such reasoning may coincidently explain why children of the profile

group characterized by extremely low perceptual sensitivity also demonstrated a moderately low level of internalizing emotion. Notably, children within this profile group exhibited greater skills in areas of communication and engagement, yet demonstrated weaker skills in areas of responsibility, empathy, and self-control. Whereas direct associations between perceptual sensitivity and individual social skills have yet to be formally investigated, the current study's findings suggest that a combination of low perceptual sensitivity, moderately low internalizing emotion, and moderately low soothability promotes the development of interactional-relational skills (i.e. making and maintaining friendships) and impedes the development of self-management (i.e. following directions). Further investigation of perceptual sensitivity's unique influence on social behavior is warranted to fully understand the true implications of the current study's results.

In accordance with original predictions, children characterized by a combination of low behavioral regulation and soothability, low positive affect, low levels of low intensity pleasure, moderately low perceptual sensitivity, and moderately high levels of negative emotionality demonstrated weaker social skills as compared to children in *all but one* other profile group, which was distinguished by low exuberance and low positive affect. Children within the latter group did *not* significantly differ from children within profile groups characterized by a) low perceptual sensitivity, moderately low internalizing emotion (fear and sadness), and moderately low soothability and b) moderately high exuberance and positive affect, moderately high anger, and moderately low behavior regulation. Though unexpected, these patterns aligned with theoretical perspectives in the existing literature on children's social competence. Although the hypothesized patterns did not consider low exuberance as predictive of weaker social functioning, the literature does support the notion that shy or withdrawn children demonstrate

less effective prosocial behaviors in comparison to their exuberant peers (Rudasill & Konold, 2008). In fact, Rudasill and Konold (2008) found that informants tended to rate shyer or inhibited children as more socially competent in areas of cooperation and self-control, whereas exuberant children tended to be rated as more socially competent in assertion. This finding was replicated in the current study, as children low in exuberance and positive affect demonstrated greater skills in areas of cooperation, self-control, and responsibility in comparison with children of the profile group characterized by moderately high exuberance and positive affect, moderately high anger, and moderately low behavior regulation. In the area of assertion, children low in exuberance and positive affect demonstrated weaker skills than children within the group characterized by moderately high exuberance and positive affect, moderately high anger, and moderately low behavior regulation. Therefore, the current results are consistent with the extant literature, which suggests that for approach-oriented children, lower levels of regulation predicted weaker social skills, whereas higher levels of regulation contribute to greater prosocial behaviors (Rubin et al., 1995).

Altogether, self-regulation (i.e. behavior regulation and soothability) appeared to be more salient in the expression of social functioning when observed within the home environment. Although characteristics of negative emotionality and exuberance (activity, approach, high intensity pleasure, shyness) still appeared to be influential, soothability and behavioral regulation promoted greater differentiation in children's social competence among parent-rated temperament profiles.

Teacher-Rated Social Skills

As reported by *teachers*, children characterized by high negative emotionality, moderately low behavior regulation, moderately low positive affect, and low soothability

displayed the weakest overall social skills as compared to children within *all* other teacher-rated profile groups. This finding was particularly notable, as such results verified the importance of children's self-regulatory abilities, such as effortful control and receptiveness to external sources of emotional regulation, in the expression of prosocial behaviors. Previous research has suggested that extreme levels of perceptual sensitivity *(high and low*), high negative emotionality, and low self-regulation predict lower social skills (Eisenberg et al., 2006). In the present study, the aforementioned group characterized by high negative affectivity, low soothability, and moderately low behavioral regulation demonstrated significantly weaker social skills than the profile group characterized by moderately high negative affectivity, *average* behavior regulation, and *average* soothability. Similar to patterns detected within caregivers' and teachers' ratings of problem behaviors, this finding may suggest that greater soothability and behavior regulation (inhibitory control and attentional focusing) lessens the impact of elevated negative affectivity on the expression of overall social skills.

Another key finding regarding the relationship between temperament profile membership and social functioning concerned the temperament group characterized by low internalizing emotion, moderately high levels of exuberance, and moderately high soothability. Children within this profile group were expected to exhibit the greatest level of social functioning in comparison to all other teacher-rated groups due to their low negative affective reactivity and soothability. However, children characterized by moderately low exuberance and moderately high behavior regulation displayed significantly greater social skills then did children classified into *all* other profile types. The children of the profile group characterized by low internalizing emotion, moderately high levels of exuberance, and moderately high soothability were rated higher in overall social skills than children within all remaining temperament groups. However,

children within this group did *not* significantly differ from the profile group marked by low exuberance and low positive affect. This finding was not initially expected but accorded with existing theory. As previously noted, existing literature suggests that children characterized by high exuberance demonstrate less prosocial behaviors, especially if such children lack sufficient self-regulatory abilities (Rudasill & Konold, 2008). In the current study, children with the profile group characterized by low internalizing emotion, moderately high levels of exuberance, and moderately high soothability did *not* display greater than average behavior regulation (attentional focusing and inhibitory control). On the contrary, children of the profile group with the greatest overall social skills displayed moderately low exuberance *in addition to* moderately high behavior regulation. Behavioral regulation, in particular, has been established as a protective factor against adverse impact of high levels of exuberance in the development of social functioning (Rubin et al., 1995; Dollar et al., 2017). In examining the pattern of results on individual social skills, children characterized by low internalizing emotion, as well as by moderately high exuberance, moderately high positive affect, and moderately high soothability demonstrated greater skills in areas of engagement and assertion, whereas the profile group distinguished by low exuberance and positive affect demonstrated weaker skills in areas of engagement and assertion. This key finding is also largely supported by existing research, as prior investigations found that inhibited children exhibited less assertiveness than their exuberant counterparts when rated within the school environment. Findings suggested that attentional focusing served as a protective factor in the relationship between shyness and assertiveness, such that shy children who displayed a greater level of attentional focusing were more likely to engage with classmates (Rudasill & Konold, 2008).

All in all, differences in the typology of self-regulation appear to have greater implications on the estimation of overall social functioning than initially believed. Although characteristics of exuberance and negative affectivity appeared to have played an important role in the differentiation of temperament profiles on teacher-rated social functioning, children's behavioral regulation seemed to assert much more of an influence. Children's emotional and behavioral regulatory abilities have been consistently linked to social competence in the extant literature. In fact, Rudasill and Konold (2008) found that both inhibitory control and attentional focusing uniquely contributed to children's ratings of social competence. Indeed, the specific *type* of self-regulation seems relevant not only to the estimation of overall problem behaviors *but also* to the estimation of overall social skills. The findings of the current study demonstrate the empirical value of disaggregating regulatory variables in relating profiles of temperament to various social competency skills. Therefore, simply measuring children's general self-regulation may not fully capture the specific impact of effortful behavior regulation and external emotion regulation on the social development of young children.

Key Findings on Parent and Teacher-Rated Social Skills

To summarize key findings regarding social outcomes of temperament profiles as rated by *both caregivers and teachers*, extreme levels of perceptual sensitivity (*high and low*), higher levels of exuberance, greater negative emotionality, lower soothability, and lower behavioral regulation contributed to weaker social functioning and maladaptive social behavior. These findings were relatively supported by the extant literature, as most variable-centric models associated with social-developmental outcomes tended to support the finding that children characterized by high approach and high negative emotionality demonstrated lower social competence, especially when such characteristics were paired with poor self-regulatory abilities

(Rubin et al., 1995; Eisenberg et al., 2006; Rudasill & Konold, 2008; Yavuz-Müren et al., 2022). In examining person-centered models, distinct patterns regarding social competency and prosocial behavior were less established, but existing research suggests that any profile marked by low behavioral regulation, greater exuberance, low soothability, and/or negative emotionality predicts poorer social skills (Laible et al., 2014; Dollar et al., 2017).

With respect to teachers' impressions of the relationship between temperament profile membership and social functioning within the school environment, students' level of exuberance seemed to have an unexpected influence on the differentiation of profile groups, especially when high or low exuberance was paired with extreme levels of behavioral regulation (attentional focusing and inhibitory control). These findings were largely supported by the extant literature, which has suggested that behavioral regulation moderates the impact of high exuberance on children's overall social competence. For approach-oriented children, lower levels of behavioral regulation appeared to predict lower prosocial behaviors, whereas higher levels of behavioral regulation contributed to greater prosocial behaviors (Rubin et al., 1995). While low exuberance was not previously considered as largely predictive of weaker social functioning in the development of the current study's hypotheses, existing literature does support the notion that shy or withdrawn children demonstrate less prosocial behaviors in comparison to their exuberant peers (Rudasill & Konold, 2008). Rudasill and Konold (2008) found that informants tended to rate shyer or inhibited children as more socially competent in particular areas such as cooperation and self-control, whereas children high in exuberance tended to be rated as more socially competent in areas of engagement and assertion. This finding was mostly replicated in the current study, as children characterized by greater exuberance and soothability demonstrated

greater skills in engagement and assertion, whereas children characterized by low exuberance demonstrated weaker skills in engagement and assertion.

In regard to caregivers' impressions of the relationship between temperament profile membership and social functioning in the home environment, exuberance, behavior regulation, and soothability *also* appeared to be central in the differentiation of profile groups, especially when paired with substantially low perceptual sensitivity and greater negative affectivity. In fact, perceptual sensitivity was a characteristic that uniquely influenced parents' ratings of overall social functioning. This finding was particularly notable, because person-centered models have not yet investigated the distinctive contribution of perceptual sensitivity in the differentiation of temperament profiles on psychosocial outcomes. Existing variable-centered research has suggested that children with low perceptual sensitivity may ignore or misinterpret internal or external environmental cues, making it more difficult to emotionally regulate after a particularly intense anxiety-provoking event (Pollak et al., 2009). However, the results of the current study also suggest that children with lower awareness of subtle environmental cues (in the presence of lower internalizing emotions) may *not* become as easily overwhelmed during social interactions. A combination of low perceptual sensitivity, moderately low internalizing emotion, and moderately low soothability was found to promote the development of interactional-relational skills (i.e. making and maintaining friendships) and to impede the development of self-management (i.e. following directions). To completely comprehend the extent to which perceptual sensitivity influences the expression of social functioning within the home environment, further empirical investigation is warranted.

As previously acknowledged, the specific *type* of self-regulation seems to have substantial implications, not only on the estimation of overall problem behaviors, but also on the

estimation of overall social skills. This finding emphasizes the value of research that preserves the complexity of children's temperament when examining different combinations of reactive and regulatory traits. Simply conveying general regulatory characteristics does not sufficiently communicate the unique contributions of behavior regulation and emotion regulation on children's social development. As previous variable-centric studies demonstrate the distinctive influence of attentional focusing and inhibitory control on social outcomes (Sanson et al., 2004), future studies should further disaggregate regulatory dimensions of temperament in the exploration of social development across multiple situational contexts. All in all, self-regulation was found to be critical to children's social adjustment and overall behavior within both home and school settings.

Limitations

Although the current study intends to make considerable efforts to address and amend limitations of existing research, there are still constraints that deserve to be mentioned. First, the current sample mostly encompasses European American children from private schools located along the North-East region of the United States. Thus, the expected findings of this study cannot be generalized to all children in the United States, much less children in other countries. Additionally, the present study uses an existing cross-sectional dataset. Therefore, it cannot be assumed that the resulting temperament profiles and their potential connection to child behavior remain stable across developmental stages. Although existing research has established stability in temperament-related behaviors (Komsi et al., 2006; Janson & Mathiesen, 2008; Sanson et al., 2009), the present study cannot logistically replicate these findings. Furthermore, while the present study's chosen analytical design poses many strengths, it also contains relative weaknesses that are worth mentioning. Because LPA assumes population heterogeneity, it meets

assumptions of many traditional multiple-group analytic techniques, which simplifies the analytical process (Spurk et. al, 2020). Moreover, compared to non-latent variable approaches, LPA classifies clusters based on membership probabilities estimated directly from the model, which allows for the use of multiple variable types (continuous, categorical, counts, etc.). Recent innovations in mixture modeling now allow researchers to account for measurement error when estimating the relationship between latent profile membership and a number of different outcomes (Nylund-Gibson et al., 2019), but there is still much to discover in regard to boundaries and limitations of such approaches in practice. For instance, due to the current study's sample size and the number of variables included in the enumeration of temperament profiles, Waldrip (2023) was unable to gain adequate power to allow means, variances, and covariances to vary freely in the latent model. Therefore, to account for limited degrees of freedom, Waldrip restricted the model to only allow means to vary freely, while variances were restricted to be equal and covariances were restricted to be zero across profiles. Such restrictions may impact the statistical quality of the current study and could limit one's ability to draw definitive conclusions about analytical results, regardless of the current study's alignment with existing theory.

Additionally, the current study investigated differences among more than one group of participants, which increases the likelihood of Type I error (i.e. false-positive error). When multiple groups of particpants are compared multiple times on multiple variables, the inflation of Type 1 error rapidly increases (Ranganathan et al., 2016). Despite the current study's use of robust analytical procedures, limitations of multiple testing should still be acknowledged. To correct for family-wise error, multiple types of statistical tests were performed and compared to examine the relationship between temperament profiles and social-developmental outcomes (see Appendix D). Results were also examined for scientific plausibility and were juxtaposed with existing theoretical rationale.

As mentioned previously, temperament profiles are just simplifications of a multitude of combined temperament characteristics (Martin et al., 2020). Profiles are varied, because each model is contingent on one unique sample defined by whatever measure the researchers choose to use. No model can fully explain the role of temperamental processes in the development of child behavior. Therefore, it would not be fair to claim that the above-mentioned interpretation of temperament is better than any other explanation. The current study only attempts to add to the shared goal of temperament research, which is to improve upon a larger understanding of temperament processes. These limitations are imparted in hopes that they are considered in future research.

Conclusions and Future Directions

The way in which children interact with their environment is influenced by a combination of temperament traits that converge to shape social, emotional, and adaptive functioning. As such, considering the complexity in children's individual differences is necessary to understand and support the development of children's social behavior. The relationship between several dimensions of temperament and children's social development has been extensively examined, yet most of the extant literature has focused on the isolated impact of specific temperamental characteristics or on a combination of reactive and regulatory attributes represented by aggregated variables. The current study transcended traditional approaches by using person-centered methodology to investigate how children with different profiles of temperament differ in behavioral and social functioning across home and school contexts. Consequently, the results of this study extend our understanding of the relationship between children's individual differences and social development, demonstrating that certain fine-tuned temperamental attributes *do* coalesce to shape children's social development .

Existing research has asserted that high levels of activity, greater negative emotionality, and poor self-regulatory skills contribute to increased externalizing behavior, whereas extreme levels of perceptual sensitivity, high inhibition, and high negative emotionally relate to greater internalizing behavioral concerns (Sanson et al., 2011). Additionally, established theory has suggested that extreme levels of perceptual sensitivity, high negative emotionality, high exuberance, low soothability, and low behavioral regulation predict weaker social skills (Eisenberg et al., 2006; Evans et.al, 2012; Laible et al. 2014; Yavuz-Müren et al., 2022). The results of the current study aligned with previous findings but uncovered novel insight regarding the historically understudied temperament characteristic of perceptual sensitivity. To the author's knowledge, the predictive value of perceptual sensitivity has never been explored in the context of person-centered methodology. Additionally, the current study uncovered the centrality of exuberance *(low and high)* and of soothability in the emergence of profiles and their connections with outcomes in concert with several other temperamental traits. Therefore, the present study is likely one of the first empirical endeavors to investigate the influence of such an expansive variety of temperamental characteristics on several social and behavior outcomes. Additionally, the present study revealed that relationships among temperament profile membership and various psychosocial outcomes were more nuanced than previously assumed. Children's self-regulation, represented as effortful control or willingness to accept external sources of emotional regulation (soothability), demonstrated considerable nuance in the expression of social functioning and problem behavior across contexts. Specifically, differences in outcomes for specific *types* of self-regulation seemed to be influential not only in the estimation of overall problem behaviors, but also in the estimation of overall social skills. These findings exemplify the benefit of preserving

complexity in person-centered investigation by disaggregating broad temperamental attributes like self-regulation.

It is important to capture as much complexity as possible in the development of temperament profiles in order to gain a complete understanding of temperament's influence on social development and to assist in the further study and practical application of person-centered research. By measuring temperament and social behavior across home and school settings, the present study exemplified the value of considering both caregiver and teacher perspectives, as several similarities and differences were identified across informant ratings. For instance, Waldrip (2023) examined the overlap of children classified into similar profile groupings by both parents and teachers. There was little overlap in children who were assigned to similar profiles across settings, despite similarities in the number and characterizations of the profiles. As previously mentioned, comparisons across informant ratings may reveal important information about the specific demands and expectations of each environment or may even uncover informants' personal values on problematic or normative behaviors (Korsch & Petermann, 2014). Therefore, increasing the complexity of person-centered approaches may be more enlightening, despite challenges that arise when interpreting results across contexts. Further investigation that includes multiple informant sources, various methodological procedures, and more demographically representative samples is needed. Additionally, future research should explore specific differences among even more distinctive types of children, such as with behaviorally inhibited children (Kagan, 1994) or with children who display high-risk or clinical levels of problem behaviors. Lastly, future person-centered research should explore the prevalence and stability of whole temperament profiles over multiple developmental stages, as longitudinal studies on this topic are nearly nonexistent. Accounting for the complexity of

children's individual differences allows scholars to more accurately relate temperament to the development of long-term behavioral outcomes. Such improvements in methodology could eventually inform diagnostic judgements and long-term intervention planning in both clinical and educational settings. Finally, continued used of person-centered methodology could allow stakeholders in children's development to better anticipate and communicate the holistic social-emotional needs of each unique child.

Appendix A

Table A1

Variables Used to Extract Profiles of Reactivity and Regulation

CBQ Factors	CBQ Scales	CBQ Scale Definitions	Present Study Variables
Surgency/ Extraversion	Activity	Level of gross motor activity including rate and extent of locomotion	Exuberance
	Approach	Amount of excitement and positive anticipation for expected pleasurable activities	
	High Intensity Pleasure	Amount of pleasure or enjoyment related to situations involving high stimulus intensity, rate, complexity, novelty and incongruity	
	Shyness	Slow or inhibited approach in situations involving novelty or uncertainty; reverse scored when composited	
	Impulsivity	Speed of response initiation	-
	Smiling/Laughter	Amount of positive affect in response to changes in stimulus intensity, rate, complexity, and incongruity	Positive Affect
Negative Affectivity	Anger	Amount of negative affect related to interruption of ongoing tasks or goal blocking	Anger
	Fear	Amount of negative affect pertaining to unease, worry or nervousness related to anticipated pain or distress and/or potentially threatening situations.	Internalizing Emotion
	Sadness	Amount of negative affect and lowered mood and energy related to exposure to suffering, disappointment, and/or object loss	
	Discomfort	Amount of negative affect related to sensory qualities of stimulation, including intensity, rate, or complexity of light, movement, sound, texture	-
	Soothability	Rate of recovery from peak distress, excitement, or general arousal	Emotion Regulation
Effortful Control	Attentional Focusing	Tendency to maintain attentional focus upon task-related channels	Behavior Regulation
	Inhibitory Control	The capacity to plan and to suppress inappropriate approach responses under instructions or in novel or uncertain situations	
	Low Intensity Pleasure	Amount of pleasure or enjoyment related to situations involving low stimulus intensity, rate, complexity, novelty and incongruity	Low Intensity Pleasure
	Perceptual Sensitivity	Amount of detection of slight, low intensity stimuli from the external environment	Perceptual Sensitivity

Note. Reprinted from *Understanding parent and teacher perspectives of temperament profiles in young children* by S. Waldrip, 2023, [Doctoral dissertation, University of Maryland, College Park]. ProQuest Dissertations and Theses Global, p. 30

Appendix B

Table B1

Parent and Teacher-Rated Profiles Selected for Hypothesis Testing – Problem Behaviors

Profiles	N	Externalizing	Internalizing	Bullying	Hyperactivity/Inattention	Autism Spectrum Disorder
Parent-Rated Profiles						
Exuberant and Dysregulated	38	X	X	-	-	-
Reserved and Regulated	21	X	X	-	-	-
Negatively Emotionally Reactive and Dysregulated	13	X	X	-	-	-
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated	41	X	X	-	-	-
Exuberant and Regulated	3	*	*	-	-	-
Under Attuned to Subtlety and Dysregulated	17	X	X	-	-	-
Teacher-Rated Profiles						
Exuberant and Regulated	31	X	X	-	-	-
Reserved and Regulated	11	X	X	-	-	-
Negatively Emotionally Reactive and Dysregulated	12	X	X	-	-	-
Negative Emotionally Reactive but Regulated	22	X	X	-	-	-
Low to Average Reactive and Regulated	49	X	X	-	-	-
Exuberant and Dysregulated	5	*	*	-	-	-
High Reactive and Dysregulated	3	*	*	-	-	-

Note. '-'= No Hypothesis. X = Formal Hypothesis Made. * = Descriptive Analyses.

Table B2

Parent and Teacher-Rated Profiles Selected for Hypothesis Testing – Social Skills

Profiles	N	Total Social Skills	Communication	Cooperation	Responsibility	Empathy	Assertion	Engagement	Self-Control
Parent-Rated Profiles									
Exuberant and Dysregulated	38	X	-	-	-	-	-	-	-
Reserved and Regulated	21	X	-	-	-	-	-	-	-
Negatively Emotionally Reactive and Dysregulated	13	X	-	-	-	-	-	-	-
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated	41	X	-	-	-	-	-	-	-
Exuberant and Regulated	3	*	-	-	-	-	-	-	-
Under Attuned to Subtlety and Dysregulated	17	X	-	-	-	-	-	-	-
Teacher-Rated Profiles									
Exuberant and Regulated	31	X	-	-	-	-	-	-	-
Reserved and Regulated	11	X	-	-	-	-	-	-	-
Negatively Emotionally Reactive and Dysregulated	12	X	-	-	-	-	-	-	-
Negative Emotionally Reactive but Regulated	22	X	-	-	-	-	-	-	-
Low to Average Reactive and Regulated	49	X	-	-	-	-	-	-	-
Exuberant and Dysregulated	5	*	-	-	-	-	-	-	-
High Reactive and Dysregulated	3	*	-	-	-	-	-	-	-

Note. '- '= No Hypothesis. X = Formal Hypothesis Made. * = Descriptive Analysis.

Appendix C

Table C1

Parent-Rated Profile Descriptive Statistics

	N	Mean	Standard Deviation	Kurtosis	Skewness
Social Skills					
Under Attuned to Subtlety and Dysregulated	17	94.35	9.94	1.71	1.15
Negatively Emotionally Reactive and Dysregulated	13	83.54	8.13	.55	.34
Exuberant and Regulated	3	93.67	7.51	---	-.20
Reserved and Regulated	21	90.24	10.07	3.84	-1.47
Exuberant and Dysregulated	38	94.24	11.02	.32	.15
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated	40	103.13	11.18	-.63	.50
Total	132	95.24	11.96	.56	.26
Communication					
Under Attuned to Subtlety and Dysregulated	17	16.29	1.99	.64	.61
Negatively Emotionally Reactive and Dysregulated	13	13.77	1.36	.12	-.44
Exuberant and Regulated	3	14.33	1.53	---	.94
Reserved and Regulated	21	14.38	2.50	-.03	-.25
Exuberant and Dysregulated	38	15.45	2.60	-.08	.02
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated	40	17.18	2.07	-.87	-.25
Total	132	15.72	2.50	-.26	-.06
Engagement					
Under Attuned to Subtlety and Dysregulated	17	16.24	2.63	-1.16	.25
Negatively Emotionally Reactive and Dysregulated	13	11.23	3.03	.68	.59
Exuberant and Regulated	3	15.00	2.65	---	-1.46
Reserved and Regulated	21	11.29	3.30	.12	-.43
Exuberant and Dysregulated	38	15.42	3.46	.10	-.30
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated	40	15.38	3.18	.59	-.28
Total	132	14.43	3.67	-.06	-.28

Note. Due to the low proportion of children represented by the Exuberant and Regulated profile type, analyses of this profile will be solely descriptive.

Table C1 ***(continued)***

Parent-Rated Profile Descriptive Statistics

	N	Mean	Standard Deviation	Kurtosis	Skewness
Assertion					
Under Attuned to Subtlety and Dysregulated	17	14.76	3.07	3.41	-1.23
Negatively Emotionally Reactive and Dysregulated	13	12.38	2.02	1.34	.59
Exuberant and Regulated	3	13.67	3.06	---	.94
Reserved and Regulated	21	13.33	2.65	-.64	-.06
Exuberant and Dysregulated	38	15.08	2.45	.00	-.12
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated	40	14.83	3.05	-.89	.15
Total	132	14.39	2.83	-.22	-.05
Responsibility					
Under Attuned to Subtlety and Dysregulated	17	10.88	2.71	1.17	-.05
Negatively Emotionally Reactive and Dysregulated	13	11.15	1.41	-1.57	.11
Exuberant and Regulated	3	12.00	2.65	---	-1.46
Reserved and Regulated	21	11.76	2.53	-.54	-.32
Exuberant and Dysregulated	38	11.18	2.25	3.62	-1.05
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated	40	13.50	2.29	-.54	.44
Total	132	11.95	2.50	1.05	-.12
Self-Control					
Under Attuned to Subtlety and Dysregulated	17	10.00	3.08	.81	.38
Negatively Emotionally Reactive and Dysregulated	13	8.46	2.57	3.19	-.99
Exuberant and Regulated	3	11.33	2.52	---	.59
Reserved and Regulated	21	10.90	2.70	-1.09	.11
Exuberant and Dysregulated	38	10.03	3.11	.13	-.48
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated	40	13.05	2.60	-.85	.10
Total	132	10.95	3.17	.08	-.16

Note. Due to the low proportion of children represented by the Exuberant and Regulated profile type, analyses of this profile will be solely descriptive.

Table C1 ***(continued)***

Parent-Rated Profile Descriptive Statistics

	N	Mean	Standard Deviation	Kurtosis	Skewness
Cooperation					
Under Attuned to Subtlety and Dysregulated	17	11.71	2.17	.83	-.40
Negatively Emotionally Reactive and Dysregulated	13	11.31	2.10	-.49	-.23
Exuberant and Regulated	3	13.67	3.06	---	.94
Reserved and Regulated	21	12.33	2.50	.69	-.53
Exuberant and Dysregulated	38	11.58	2.07	3.18	.27
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated	40	14.27	2.01	-1.01	.30
Total	132	12.55	2.44	.32	.02
Empathy					
Under Attuned to Subtlety and Dysregulated	17	11.41	2.79	3.14	-.48
Negatively Emotionally Reactive and Dysregulated	13	10.15	3.18	-.30	.42
Exuberant and Regulated	3	10.33	2.08	---	-1.29
Reserved and Regulated	21	12.14	3.61	.46	.19
Exuberant and Dysregulated	38	12.66	3.79	-.20	-.52
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated	40	13.80	2.92	-.84	-.14
Total	132	12.46	3.45	-.23	-.19
Externalizing					
Under Attuned to Subtlety and Dysregulated	17	9.76	3.73	1.47	1.21
Negatively Emotionally Reactive and Dysregulated	13	10.15	3.85	-1.20	.35
Exuberant and Regulated	3	6.67	2.31	---	-1.73
Reserved and Regulated	21	7.76	2.84	-.54	.15
Exuberant and Dysregulated	38	9.18	3.85	-.19	.42
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated	40	5.65	3.08	-.77	-.37
Total	132	8.00	3.79	.42	.40

Note. Due to the low proportion of children represented by the Exuberant and Regulated profile type, analyses of this profile will be solely descriptive.

Table C1 ***(continued)***

Parent-Rated Profile Descriptive Statistics

	N	Mean	Standard Deviation	Kurtosis	Skewness
Internalizing					
Under Attuned to Subtlety and Dysregulated	17	4.18	2.94	-.38	.46
Negatively Emotionally Reactive and Dysregulated	13	7.31	3.35	-.64	.47
Exuberant and Regulated	3	1.00	.00	---	.
Reserved and Regulated	21	5.10	2.70	-.94	.38
Exuberant and Dysregulated	38	3.92	2.96	-.72	.43
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated	40	3.68	2.81	.44	.81
Total	132	4.33	3.07	-.22	.59
Hyperactivity/Inattention					
Under Attuned to Subtlety and Dysregulated	17	7.00	2.26	1.70	1.25
Negatively Emotionally Reactive and Dysregulated	13	7.31	2.36	-.49	-.21
Exuberant and Regulated	3	5.67	2.52	---	-.59
Reserved and Regulated	21	5.38	1.66	.16	-.61
Exuberant and Dysregulated	38	7.00	3.12	.65	.86
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated	40	4.48	2.41	-.13	.02
Total	132	5.98	2.74	1.13	.56
Bullying					
Under Attuned to Subtlety and Dysregulated	17	1.53	1.77	5.00	1.97
Negatively Emotionally Reactive and Dysregulated	13	1.92	1.71	-.26	.74
Exuberant and Regulated	3	1.00	1.00	---	.00
Reserved and Regulated	21	1.10	1.26	-.17	.96
Exuberant and Dysregulated	38	1.26	1.62	2.00	1.63
Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated	40	.58	1.06	4.38	2.18
Total	132	1.12	1.47	2.60	1.65

Note. Due to the low proportion of children represented by the Exuberant and Regulated profile type, analyses of this profile will be solely descriptive.

Table C2 ***(continued)***

Teacher-Rated Profile Descriptive Statistics

	N	Mean	Standard Deviation	Kurtosis	Skewness
Social Skills					
Exuberant and Dysregulated	5	83.00	7.14	-1.27	.07
Reserved and Regulated	11	98.00	10.66	2.73	-1.09
Low to Average Reactive and Regulated	47	108.89	9.98	-.68	.40
Exuberant and Regulated	31	104.26	10.26	-.47	.05
Negative Emotionally Reactive but Regulated	22	97.36	5.46	-.39	.45
Negatively Emotionally Reactive and Dysregulated	12	87.08	7.67	3.93	-1.66
High Reactive and Dysregulated	3	85.33	10.41	---	1.29
Total	131	101.42	12.05	.12	.02
Communication					
Exuberant and Dysregulated	5	12.20	3.11	2.68	-1.55
Reserved and Regulated	11	15.09	3.21	1.69	-.68
Low to Average Reactive and Regulated	48	17.67	2.39	-.86	-.27
Exuberant and Regulated	31	17.39	2.28	-.86	.08
Negative Emotionally Reactive but Regulated	22	14.86	1.52	-.40	.34
Negatively Emotionally Reactive and Dysregulated	12	12.92	1.62	1.89	-1.53
High Reactive and Dysregulated	3	12.67	3.06	---	.94
Total	132	16.17	2.91	.09	-.26
Engagement					
Exuberant and Dysregulated	5	14.60	1.82	1.07	-.27
Reserved and Regulated	11	13.64	3.01	-.39	-.11
Low to Average Reactive and Regulated	47	16.26	2.70	.04	-.05
Exuberant and Regulated	31	17.26	2.28	-.60	-.38
Negative Emotionally Reactive but Regulated	22	14.82	2.34	-.78	.34
Negatively Emotionally Reactive and Dysregulated	12	12.50	2.50	1.05	-.98
High Reactive and Dysregulated	3	13.67	3.21	---	-1.55
Total	131	15.56	2.90	-.08	-.22

Note. Due to the low proportion of children represented by the Exuberant and Dysregulated and High Reactive and Dysregulated profile types, analyses of these profiles will be solely descriptive.

Table C2 ***(continued)***

Teacher-Rated Profile Descriptive Statistics

	N	Mean	Standard Deviation	Kurtosis	Skewness
Assertion					
Exuberant and Dysregulated	5	10.40	1.67	.54	1.09
Reserved and Regulated	11	10.27	3.29	-.21	.32
Low to Average Reactive and Regulated	47	13.51	3.54	-.37	.34
Exuberant and Regulated	31	13.94	2.98	.33	-.09
Negative Emotionally Reactive but Regulated	22	13.14	2.14	.39	-.42
Negatively Emotionally Reactive and Dysregulated	12	11.75	4.11	.19	-.94
High Reactive and Dysregulated	3	13.67	3.06	---	.94
Total	131	13.00	3.33	.22	-.05
Responsibility					
Exuberant and Dysregulated	5	7.60	1.95	-2.48	-.76
Reserved and Regulated	11	13.82	3.03	1.39	-1.08
Low to Average Reactive and Regulated	47	15.43	2.42	-1.17	-.41
Exuberant and Regulated	31	13.16	2.53	-.43	.22
Negative Emotionally Reactive but Regulated	22	12.09	1.72	1.24	.03
Negatively Emotionally Reactive and Dysregulated	12	10.33	1.72	.81	-1.26
High Reactive and Dysregulated	3	8.67	3.79	---	1.60
Total	131	13.27	3.13	-.40	-.21
Self-Control					
Exuberant and Dysregulated	5	8.20	4.32	1.34	-.23
Reserved and Regulated	11	13.36	3.93	2.73	-1.20
Low to Average Reactive and Regulated	47	15.85	2.98	2.68	-.65
Exuberant and Regulated	31	14.26	3.35	.33	-.61
Negative Emotionally Reactive but Regulated	22	12.14	2.70	1.52	-.45
Negatively Emotionally Reactive and Dysregulated	12	8.92	1.78	-.68	.03
High Reactive and Dysregulated	3	7.00	3.61	---	1.15
Total	131	13.51	3.95	.07	-.46

Note. Due to the low proportion of children represented by the Exuberant and Dysregulated and High Reactive and Dysregulated profile types, analyses of these profiles will be solely descriptive.

Table C2 ***(continued)***

Teacher-Rated Profile Descriptive Statistics

	N	Mean	Standard Deviation	Kurtosis	Skewness
Cooperation					
Exuberant and Dysregulated	5	6.00	1.41	-1.75	-.88
Reserved and Regulated	11	13.55	2.81	1.98	-1.19
Low to Average Reactive and Regulated	48	14.94	2.67	-.90	-.63
Exuberant and Regulated	31	12.39	2.82	-.73	-.22
Negative Emotionally Reactive but Regulated	22	11.36	2.30	1.05	.72
Negatively Emotionally Reactive and Dysregulated	12	9.92	2.07	-.25	-.61
High Reactive and Dysregulated	3	7.67	3.79	---	1.60
Total	132	12.67	3.42	-.65	-.28
Empathy					
Exuberant and Dysregulated	5	10.00	3.39	.49	.58
Reserved and Regulated	11	11.64	2.54	.42	.90
Low to Average Reactive and Regulated	48	14.21	2.62	-.32	.23
Exuberant and Regulated	31	12.42	3.25	-.45	-.43
Negative Emotionally Reactive but Regulated	22	12.45	2.09	2.02	1.19
Negatively Emotionally Reactive and Dysregulated	12	9.50	1.73	-.19	-.94
High Reactive and Dysregulated	3	10.67	3.21	---	-1.55
Total	132	12.61	3.02	-.17	.03
Externalizing					
Exuberant and Dysregulated	5	11.80	3.11	-1.92	.56
Reserved and Regulated	11	5.55	4.68	-1.94	.12
Low to Average Reactive and Regulated	48	2.54	2.95	1.05	1.33
Exuberant and Regulated	31	5.87	4.13	-.39	.49
Negative Emotionally Reactive but Regulated	22	7.27	4.11	-.82	.11
Negatively Emotionally Reactive and Dysregulated	12	10.67	4.19	-1.59	.33
High Reactive and Dysregulated	3	18.00	7.94	---	1.46
Total	132	5.80	5.03	1.15	.94

Note. Due to the low proportion of children represented by the Exuberant and Dysregulated and High Reactive and Dysregulated profile types, analyses of these profiles will be solely descriptive.

Table C2 ***(continued)***

Teacher-Rated Profile Descriptive Statistics

	N	Mean	Standard Deviation	Kurtosis	Skewness
Internalizing					
Exuberant and Dysregulated	5	4.80	3.42	-2.98	.59
Reserved and Regulated	11	5.00	2.90	-.36	-.87
Low to Average Reactive and Regulated	48	2.54	2.74	-1.06	.66
Exuberant and Regulated	31	.90	1.08	.67	1.06
Negative Emotionally Reactive but Regulated	22	3.77	3.82	2.22	1.48
Negatively Emotionally Reactive and Dysregulated	12	4.42	3.85	.82	1.11
High Reactive and Dysregulated	3	1.00	1.00	---	.00
Total	132	2.79	3.08	1.46	1.27
Hyperactivity/Inattention					
Exuberant and Dysregulated	5	14.00	1.73	3.67	1.92
Reserved and Regulated	11	4.36	2.34	-.80	-.60
Low to Average Reactive and Regulated	48	2.85	2.53	-.84	.46
Exuberant and Regulated	31	6.32	3.92	-.52	.13
Negative Emotionally Reactive but Regulated	22	6.27	2.99	-.11	-.23
Negatively Emotionally Reactive and Dysregulated	12	9.33	3.50	.66	.84
High Reactive and Dysregulated	3	14.00	4.00	---	.00
Total	132	5.63	4.21	.06	.65
Bullying					
Exuberant and Dysregulated	5	2.20	3.27	4.68	2.13
Reserved and Regulated	11	1.73	1.79	-.93	.63
Low to Average Reactive and Regulated	48	.81	1.32	3.15	1.88
Exuberant and Regulated	31	1.77	2.04	-.65	.85
Negative Emotionally Reactive but Regulated	22	2.00	1.95	.54	1.01
Negatively Emotionally Reactive and Dysregulated	12	2.42	1.83	-1.48	.11
High Reactive and Dysregulated	3	4.00	5.20	---	1.73
Total	132	1.58	1.98	2.31	1.50

Note. Due to the low proportion of children represented by the Exuberant and Dysregulated and High Reactive and Dysregulated profile types, analyses of these profiles will be solely descriptive.

Table C2 ***(continued)***

Teacher-Rated Profile Descriptive Statistics

	N	Mean	Standard Deviation	Kurtosis	Skewness
Autism Spectrum					
Exuberant and Dysregulated	5	16.20	4.87	1.92	1.16
Reserved and Regulated	11	9.91	5.07	-.84	-.29
Low to Average Reactive and Regulated	48	5.54	3.92	.48	.81
Exuberant and Regulated	31	5.52	4.16	-.45	.59
Negative Emotionally Reactive but Regulated	22	9.95	3.54	.12	.43
Negatively Emotionally Reactive and Dysregulated	12	13.42	5.79	4.55	2.08
High Reactive and Dysregulated	3	14.33	6.35	---	-1.73
Total	132	7.95	5.33	1.10	.81

Note. Due to the low proportion of children represented by the Exuberant and Dysregulated and High Reactive and Dysregulated profile types, analyses of these profiles will be solely descriptive.

Appendix D

Table D1

Behavioral and Social Outcomes of Parent and Teacher-Rated Profiles

	Externalizing	Internalizing	Social Skills
Parent-Rated Profiles			
	Negatively Emotionally Reactive and Dysregulated^{A} (13)	Negatively Emotionally Reactive and Dysregulated^{A} (13)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{A} (40)
	Under Attuned to Subtlety and Dysregulated^{A} (17)	Reserved and Regulated^{AB} (21)	Under Attuned to Subtlety and Dysregulated^{B} (17)
	Exuberant and Dysregulated^{A} (38)	Under Attuned to Subtlety and Dysregulated^{B} (17)	Exuberant and Dysregulated^{B} (38)
	Reserved and Regulated^{AB} (21)	Exuberant and Dysregulated^{B} (38)	Reserved and Regulated^{BC} (21)
	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{B} (40)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{B} (40)	Negatively Emotionally Reactive and Dysregulated^{C} (13)
Teacher-Rated Profiles			
	Negatively Emotionally Reactive and Dysregulated^{A} (12)	Reserved and Regulated^{A} (11)	Low to Average Reactive and Regulated^{A} (47)
	Negative Emotionally Reactive but Regulated^{AB} (22)	Negatively Emotionally Reactive and Dysregulated^{A} (12)	Exuberant and Regulated^{AB} (31)
	Exuberant and Regulated^{B} (31)	Negative Emotionally Reactive but Regulated^{A} (22)	Reserved and Regulated^{B} (11)
	Reserved and Regulated^{BC} (11)	Low to Average Reactive and Regulated^{AB} (48)	Negative Emotionally Reactive but Regulated^{B} (22)
	Low to Average Reactive and Regulated^{C} (48)	Exuberant and Regulated^{B} (31)	Negatively Emotionally Reactive and Dysregulated^{C} (12)

Note. Profiles are ordered from highest scoring to lowest scoring profiles. Higher scores indicate higher levels of problem behaviors and higher levels of social skills. Tukey post hoc comparisons follow A > B > C > D. Profiles that share a subscript are not significantly different from one another. $\alpha = 0.05$

Table D2

Behavioral Outcomes of Parent and Teacher-Rated Profiles

	Hyperactivity/Inattention	Bullying	Autism Spectrum Disorder
Parent-Rated Profiles			
	Negatively Emotionally Reactive and Dysregulated^{A} (13)	Negatively Emotionally Reactive and Dysregulated^{A} (13)	Negatively Emotionally Reactive and Dysregulated^{A} (13)
	Under Attuned to Subtlety and Dysregulated^{A} (17)	Under Attuned to Subtlety and Dysregulated^{AB} (17)	Reserved and Regulated^{AB} (21)
	Exuberant and Dysregulated^{A} (38)	Exuberant and Dysregulated^{AB} (38)	Exuberant and Dysregulated^{BC} (38)
	Reserved and Regulated^{AB} (21)	Reserved and Regulated^{AB} (21)	Under Attuned to Subtlety and Dysregulated^{C} (17)
	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{B} (40)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{B} (40)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{C} (40)
Teacher-Rated Profiles			
	Negatively Emotionally Reactive and Dysregulated^{A} (12)	Negatively Emotionally Reactive and Dysregulated^{A} (12)	Negatively Emotionally Reactive and Dysregulated^{A} (12)
	Exuberant and Regulated^{B} (31)	Negative Emotionally Reactive but Regulated^{AB} (22)	Negative Emotionally Reactive but Regulated^{A} (22)
	Negative Emotionally Reactive but Regulated^{AB} (22)	Exuberant and Regulated^{AB} (31)	Reserved and Regulated^{A} (11)
	Reserved and Regulated^{BC} (11)	Reserved and Regulated^{AB} (11)	Low to Average Reactive and Regulated^{B} (48)
	Low to Average Reactive and Regulated^{C} (48)	Low to Average Reactive and Regulated^{B} (48)	Exuberant and Regulated^{B} (31)

Note. Profiles are ordered from highest scoring to lowest scoring profiles. Higher scores indicate higher levels of problem behaviors and higher levels of social skills. Tukey post hoc comparisons follow A > B > C > D. Profiles that share a subscript are not significantly different from one another. $\alpha = 0.05$

Table D3

Social Outcomes of Parent and Teacher-Rated Profiles

	Communication	Engagement	Assertion
Parent-Rated Profiles			
	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{A} (40)	Under Attuned to Subtlety and Dysregulated^{A} (17)	Exuberant and Dysregulated^{A} (38)
	Under Attuned to Subtlety and Dysregulated^{AB} (17)	Exuberant and Dysregulated^{A} (38)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{A} (40)
	Exuberant and Dysregulated^{B} (38)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{A} (40)	Under Attuned to Subtlety and Dysregulated^{AB} (17)
	Reserved and Regulated^{B} (21)	Reserved and Regulated^{B} (21)	Reserved and Regulated^{AB} (21)
	Negatively Emotionally Reactive and Dysregulated^{B} (13)	Negatively Emotionally Reactive and Dysregulated^{B} (13)	Negatively Emotionally Reactive and Dysregulated^{B} (13)
Teacher-Rated Profiles			
	Low to Average Reactive and Regulated^{A} (47)	Exuberant and Regulated^{A} (31)	Exuberant and Regulated^{A} (31)
	Exuberant and Regulated^{A} (31)	Low to Average Reactive and Regulated^{AB} (47)	Low to Average Reactive and Regulated^{A} (47)
	Reserved and Regulated^{B} (11)	Negative Emotionally Reactive but Regulated^{BC} (22)	Negative Emotionally Reactive but Regulated^{AB} (22)
	Negative Emotionally Reactive but Regulated^{B} (22)	Reserved and Regulated^{C} (11)	Negatively Emotionally Reactive and Dysregulated^{AB} (12)
	Negatively Emotionally Reactive and Dysregulated^{B} (12)	Negatively Emotionally Reactive and Dysregulated^{C} (12)	Reserved and Regulated^{B} (11)

Note. Profiles are ordered from highest scoring to lowest scoring profiles. Higher scores indicate higher levels of problem behaviors and higher levels of social skills. Tukey post hoc comparisons follow A > B > C > D. Profiles in the same subset are not significantly different from one another. $\alpha = 0.05$

Table D4

Social Outcomes of Parent and Teacher-Rated Profiles

	Responsibility	Self-Control
Parent-Rated Profiles		
	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{A} (40)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{A} (40)
	Reserved and Regulated^{B} (21)	Reserved and Regulated^{B} (21)
	Exuberant and Dysregulated^{B} (38)	Exuberant and Dysregulated^{B} (38)
	Negatively Emotionally Reactive and Dysregulated^{B} (13)	Under Attuned to Subtlety and Dysregulated^{B} (17)
	Under Attuned to Subtlety and Dysregulated^{B} (17)	Negatively Emotionally Reactive and Dysregulated^{B} (13)
Teacher-Rated Profiles		
	Low to Average Reactive and Regulated^{A} (47)	Low to Average Reactive and Regulated^{A} (47)
	Reserved and Regulated^{AB} (11)	Exuberant and Regulated^{AB} (31)
	Exuberant and Regulated^{B} (31)	Reserved and Regulated^{AB} (11)
	Negative Emotionally Reactive but Regulated^{BC} (22)	Negative Emotionally Reactive but Regulated^{B} (22)
	Negatively Emotionally Reactive and Dysregulated^{C} (12)	Negatively Emotionally Reactive and Dysregulated^{C} (12)

Note. Profiles are ordered from highest scoring to lowest scoring profiles. Higher scores indicate higher levels of problem behaviors and higher levels of social skills. Tukey post hoc comparisons follow A > B > C > D. Profiles in the same subset are not significantly different from one another. $\alpha = 0.05$

Table D5

Social Outcomes of Parent and Teacher-Rated Profiles

	Cooperation	Empathy
Parent-Rated Profiles		
	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{A} (40)	Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated^{A} (40)
	Reserved and Regulated^{B} (21)	Exuberant and Dysregulated^{AB} (38)
	Under Attuned to Subtlety and Dysregulated^{B} (17)	Reserved and Regulated^{AB} (21)
	Exuberant and Dysregulated^{B} (38)	Under Attuned to Subtlety and Dysregulated^{AB} (17)
	Negatively Emotionally Reactive and Dysregulated^{B} (13)	Negatively Emotionally Reactive and Dysregulated^{B} (13)
Teacher-Rated Profiles		
	Low to Average Reactive and Regulated^{A} (47)	Low to Average Reactive and Regulated^{A} (47)
	Reserved and Regulated^{AB} (11)	Negative Emotionally Reactive but Regulated^{AB} (22)
	Exuberant and Regulated^{B} (31)	Exuberant and Regulated^{B} (31)
	Negative Emotionally Reactive but Regulated^{BC} (22)	Reserved and Regulated^{BC} (11)
	Negatively Emotionally Reactive and Dysregulated^{C} (12)	Negatively Emotionally Reactive and Dysregulated^{C} (12)

Note. Profiles are ordered from highest scoring to lowest scoring profiles. Higher scores indicate higher levels of problem behaviors and higher levels of social skills. Tukey post hoc comparisons follow A > B > C > D. Profiles in the same subset are not significantly different from one another. $\alpha = 0.05$

Table D6

Mean Comparisons Between Parent-Rated Profiles on Social and Behavioral Outcomes

	F	df	η^2	1[a]	2[a]	3[c]	4[d]	5[e]
Social Skills	10.90***	4, 128	.26	94.35 (9.94)	83.54 (8.13)	90.24 (10.07)	94.24 (11.02)	103.13 (11.18)
Communication	8.89***	4, 128	.22	16.29 (1.99)	13.77 (1.36)	14.38 (2.50)	15.45 (2.60)	17.18 (2.07)
Engagement	11.38***	4, 128	.27	16.24 (2.63)	11.23 (3.03)	11.29 (3.30)	15.42 (3.46)	15.38 (3.18)
Assertion	3.47*	4, 128	.10	14.76 (3.07)	12.38 (2.02)	13.33 (2.65)	15.08 (2.45)	14.83 (3.05)
Responsibility	6.88***	4, 128	.18	10.88 (2.71)	11.15 (1.41)	11.76 (2.53)	11.18 (2.25)	13.50 (2.29)
Self-Control	9.45***	4, 128	.23	10.00 (3.08)	8.46 (2.57)	10.90 (2.70)	10.03 (3.11)	13.05 (2.60)
Cooperation	10.22***	4, 128	.25	11.71 (2.17)	11.31 (2.10)	12.33 (2.50)	11.58 (2.07)	14.27 (2.01)
Empathy	3.68**	4, 128	.11	11.41 (2.79)	10.15 (3.18)	12.14 (3.61)	12.66 (3.79)	13.80 (2.92)
Externalizing	8.13***	4, 128	.21	9.76 (3.73)	10.15 (3.85)	7.76 (2.84)	9.18 (3.85)	5.65 (3.08)
Internalizing	4.44**	4, 128	.13	4.18 (2.94)	7.31 (3.35)	5.10 (2.70)	3.92 (2.96)	3.68 (2.81)
Hyperactivity/Inattention	7.00***	4, 128	.18	7.00 (2.26)	7.31 (2.36)	5.38 (1.66)	7.00 (3.12)	4.48 (2.41)
Bullying	2.87*	4, 128	.09	1.53 (1.77)	1.92 (1.71)	1.10 (1.26)	1.26 (1.62)	.58 (1.06)
Autism Spectrum	10.20***	4, 128	.25	8.06 (2.86)	14.38 (5.49)	12.10 (3.87)	9.03 (4.50)	7.17 (3.97)

Note. Cells contain class-specific means and (standard deviations). * $p < .05$ ** $p < .01$ *** $p < .001$. [a] Under Attuned to Subtlety and Dysregulated [b] Negatively Emotionally Reactive and Dysregulated [c] Reserved and Regulated. [d] Exuberant and Dysregulated. [e] Positively Emotionally Reactive, Highly Attuned to Subtlety, and Well-Regulated

Table D7

Mean Comparisons Between Teacher-Rated Profiles on Social and Behavioral Outcomes

	F	df	η^2	1[a]	2[a]	3[c]	4[d]	5[e]
Social Skills	16.48***	4, 127	.36	98.00 (10.66)	108.89 (9.98)	104.26 (10.26)	97.36 (5.46)	87.08 (7.67)
Communication	15.93***	4, 127	.35	15.09 (3.21)	17.67 (2.39)	17.39 (2.28)	14.86 (1.52)	12.92 (1.62)
Engagement	10.64***	4, 127	.27	13.64 (3.01)	16.26 (2.70)	17.26 (2.28)	14.82 (2.34)	12.50 (2.50)
Assertion	3.33*	4, 127	.10	10.27 (3.29)	13.51 (3.54)	13.94 (2.98)	13.14 (2.14)	11.75 (4.11)
Responsibility	15.54***	4, 127	.35	13.82 (3.03)	15.43 (2.42)	13.16 (2.53)	12.09 (1.72)	10.33 (1.72)
Self-Control	15.01***	4, 127	.34	13.36 (3.93)	15.85 (2.98)	14.26 (3.35)	12.14 (2.70)	8.92 (1.78)
Cooperation	13.49***	4, 127	.31	13.55 (2.81)	14.94 (2.67)	12.39 (2.82)	11.36 (2.30)	9.92 (2.07)
Empathy	8.90***	4, 127	.23	11.64 (2.54)	14.21 (2.62)	12.42 (3.25)	12.45 (2.09)	9.50 (1.73)
Externalizing	14.25***	4, 128	.32	5.55 (4.68)	2.54 (2.95)	5.87 (4.13)	7.27 (4.11)	10.67 (4.19)
Internalizing	6.95***	4, 128	.19	5.00 (2.90)	2.54 (2.74)	.90 (1.08)	3.77 (3.82)	4.42 (3.85)
Hyperactivity/Inattention	14.11***	4, 128	.32	4.36 (2.34)	2.85 (2.53)	6.32 (3.92)	6.27 (2.99)	9.33 (3.50)
Bullying	3.44*	4, 128	.10	1.73 (1.79)	.81 (1.32)	1.77 (2.04)	2.00 (1.95)	2.42 (1.83)
Autism Spectrum	12.88***	4, 128	.30	9.91 (5.07)	5.54 (3.92)	5.52 (4.16)	9.95 (3.54)	13.42 (5.79)

Note. Cells contain class-specific means and (standard deviations). * $p < .05$ ** $p < .01$ *** $p < .001$. [a] Reserved and Regulated. [b] Low to Average Reactive and Regulated [c] Exuberant and Regulated [d] Negatively Emotionally Reactive but Regulated [e] Negatively Emotionally Reactive and Dysregulated

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