KINDERGARTEN ASSESSMENT:

ANALYSIS OF THE CHILD BEHAVIORAL RATING SCALE (CBRS)

by

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DISSERTATION ABSTRACT

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Oregon's Kindergarten Assessment (KA) is mandatory for all incoming Oregon kindergarteners starting in the 2013-14 school year. One component of Oregon's KA is the Child Behavioral Rating Scale (CBRS), which Oregon has adapted into the Approaches to Learning Assessment. Teachers complete the CBRS during the first four to six weeks of school. This study uses a convenience sample of 731 kindergarten students (across two years) from one district in Oregon to analyze behavioral readiness (self-regulation and social-emotional behaviors) as well as easyCBM indicators of academic readiness. The CBRS is compared with the Child Behavioral Checklist and the Ages and Stages Questionnaire: Social Emotional as criterion measures. Parent and teacher responses to the CBRS are analyzed for comparability, and a Receiver Operating Characteristic curve analysis of the data is used to determine optimal cut points (maximizing sensitivity and specificity) for predicting whether students are at risk compared to the criterion measure cut scores. Demographic variables of gender, English Language Learner status, and Socioeconomic Status, are analyzed as control variables. Pre-post behavior change on the CBRS is document over the kindergarten year, and kindergarten academic benchmark measures is used as a dependent measure. This study explores whether: (a) parent responses differ significantly from teacher responses

(internal consistency), (b) a cut score on the CBRS successfully sorts students into categories of "typically developing" or "in need of further assessment," (c) teacher predictions align to the proposed CBRS cut score, (d) academic risk is correlated to the established CBRS cut score, and (e) change in behavior over the course of kindergarten is measured (pre-post) by the CBRS. Results from this research could support identification of students for interventions in both kindergarten and early childhood programs.

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This dissertation is dedicated to the following:

We Will Win. Carpe diem, quam minimum credula postero. Win The Day.

GO DUCKS!

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CHAPTER I

INTRODUCTION

The number of children aged three to five years old enrolled in public preschool programs increased from three million in 1994 to five million in 2011 (Davis & Bauman, 2011). During the same time period preschool programs experienced significant increases in attendance and elementary schools moved from half-day kindergarten to full-day programming. Only 56% of elementary schools in the United States offered full-day kindergarten programs in 1998; that percentage increased to 76% by 2006 (Flanagan & McPhee, 2009; Walston & West, 2004). Of Oregon's 197 districts, 108 currently offer full-day kindergarten. According to the Oregon Department of Education (ODE), about 42.3% of Oregon's 41,645 kindergarten students are educated in full-day programs (Oregon Department of Education, 2015a). Senate Bill 248 mandates full-day kindergarten programs as of July 1, 2015 (Oregon Legislative Assembly, 2015).

Full day kindergarten programs are also receiving additional attention because of the newly-adopted Common Core State Standards (CCSS) (National Governors Association Center, 2010) . In 2010, 47 states adopted the CCSS. The increased level of academic rigor called for in the standards requires that kindergarten students complete the curriculum formerly reserved for first grade students (Carmichael, Martino, Porter-Magee, & Wilson, 2010). Given the increased difficulty of the CCSS for kindergarten, educators and policymakers understood that getting this level of rigor into a 2.5 hour (half-day) program presented a significant hurdle for kindergarten staff and students; thus, overall, programming has largely moved to full-day (Davis & Bauman, 2011).

In the kindergarten year, a considerable degree of emphasis is also placed on children acquiring the behavioral skills necessary to facilitate the learning process (Piotrkowski, Botsko, & Matthews, 2000). The development of behavioral skills within this first year of public schooling can have academic achievement implications throughout elementary and into middle school, beyond the contributions of family background factors such as maternal education (McClelland, Acock, & Morrison, 2006). In the current political climate, with the push for reading readiness at kindergarten, many preschool programs have adjusted their curricula and shifted the focus from social-emotional skill-building toward academic components (Zubrzycki, 2011). The Oregon Early Learning Council (ELC) supports assessing both academic and behavioral components as children enter the school system.

The Kindergarten Assessment (KA) committee members from the ELC argued that the screening of behavior (together with academics) was critical for early leaning and collaborated with the Oregon Department of Education in selecting the Child Behavior Rating Scale (CBRS; Bronson, Goodson, Layzer, & Love, 1990) as one component of a composite Kindergarten Assessment, that also included an academic assessment. Oregon calls the behavioral component (CBRS) of the KA the "Approaches to Learning Assessment" (ATLA). Items on the CBRS measure two constructs that are both important to early learning contexts and related to students' academic development: behavioral self-regulatory skills and social-emotional development (CBRS; Bronson et al., 1990). Districts received CBRS reports from ODE that included average scores in each of the sub-categories; social emotional and self-regulatory behavior.

The primary focus of the literature synthesis is early childhood and the transition to kindergarten. The constructs of social-emotional behavior and self-regulatory behavior, as well as the relationship between the two constructs, are reviewed as part of my study, along with the relation between behavioral constructs and academic performance. Finally, this research explores the validity of parents as respondents on a behavioral rating scale.

Kindergarten Assessment (KA)

In 2012, House Bill 4165 directed the ELC and ODE to jointly develop a kindergarten assessment to be piloted in the fall of 2012 and ready for statewide implementation by fall 2013. On March 7, 2013, the Oregon State Board of Education (SBE) adopted Oregon Administrative Rule 581-022-2130, mandating that ODE develop and implement an assessment upon entry to kindergarten as part of the statewide assessment system for the 2013-2014 school year. The KA is a composite assessment comprised of a behavioral screener (CBRS, known as the ATLA) and an academic assessment battery (easyCBM© early literacy measures of Letter Names and Letter Sounds and an early numeracy measure, of Numbers and Operations).

The study of kindergarten readiness may help identify key skills related to educating children prior to K-12 public schooling. More specifically, analyzing kindergarten readiness may provide insight on how young children are currently performing and predict future behavioral and academic performance throughout elementary grades and beyond.

Assessing kindergarten entry skills provides a unique opportunity to take a snapshot that answers critical questions related to behavioral and academic readiness for later schooling. The results of the KA may help local educators support their students' strengths and meet their behavioral and instructional needs in kindergarten and beyond. The results of the KA also may assist educators in identifying needed resources and community partnerships to strengthen children's readiness to learn prior to kindergarten entrance.

Importance of Behavioral Rating/Screening in Early Childhood and Kindergarten

My research establishes a sensitive and specific cut score on the CBRS that districts can use to determine if a student is *typically developing* or if the student *may be in need of further behavioral assessment*. Early identification of behavioral readiness could support day-care centers, preschools, schools, and communities in determining how to allocate limited intervention resources for maximum effect. Behavioral components of social-emotional and task behaviors are reviewed with the focus on early childhood, preschool, and the kindergarten transition year. I explored items that connect behavior to academics and predict future academic achievement. Change (delta) in behavior as measured by the CBRS (pre-post) over the course of the kindergarten year was investigated and reported. The appropriate use of parents as respondents on behavioral screening tools is discussed and types of possible bias examined.

Importance of self-regulation skills. Increasing attention is being paid to self-regulation as a factor that consistently predicts educational experiences and outcomes in early childhood and ultimately leads to differences in academic achievement. Self-

regulatory skills, which help children direct and control attention and behavior, are crucial for successful school performance and adaptation (Blair, 2002). The literature on self-regulation is diverse in its conceptualization of the behavioral term. Self-regulation in early childhood includes behavioral self-regulation, which depends on cognitive skills including working memory, attention control and switching, and inhibitory control (McClelland, Connor, Jewkes, Cameron, Farris, & Morrison, 2007). Behavioral regulation requires children to integrate multiple component skills and form behavioral responses, such as remembering a classroom rule to raise their hand before participating (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). Self-regulation includes children's ability to remember directives, as well as monitor, inhibit, and direct attention and behavior (Rueda, Posner, & Rothbart, 2005) . Successfully regulating one's behavior is associated with executive function, a primary cognitive construct (Zelazo, Müller, Frye, & Marcovitch, 2003). Another related term includes cognitive regulation, defined as "the regulation of attention and selective strategy use in the execution of cognitive tasks" (Blair, 2002, p. 112). Though successful classroom behavior also includes social skills, such as controlling aggression and getting along with peers (McClelland et al., 2007), growing evidence suggests that behavioral self-regulation and its underlying cognitive skills, including attention, are stronger predictors of multiple areas of achievement than mere social skills (Duncan, Dowsett, Claessens, Magnuson, Huston, & Klebanov, 2007).

Strong behavioral regulation early in the school trajectory sets the stage for academic success, predicting increased school engagement and motivation in children's adoption of positive learning strategies (Fredricks, Blumenfeld, & Paris, 2004) . Strong

behavioral self-regulation in the fall of kindergarten also predicts higher year-end achievement in mathematics and reading (McClelland, Morrison, & Holmes, 2000).

Deficiencies in self-regulation present at a younger age may progressively undermine academic progress and predict lower achievement outcomes, as well (Vitaro, Brendgen, Larose, & Tremblay, 2005). For example, children with difficulty regulating attention exhibit low achievement on measures of literacy, math, and listening (Howse, Calkins, Anastopoulos, Keane, & Shelton, 2003). At present, social-emotional skills and self-regulating behaviors have been measured with teacher and parent reports, whereas academic achievement has been assessed through student performance measures.

An investigation using measures of self-regulation and social-emotional behavior, as well as achievement, is necessary for identifying whether early academic skills are inherently important, as suggested by Duncan et al. (2007), or whether regulatory skills play a significant role in other academic achievement trajectories, as suggested by other research (McClelland et al., 2006). If available research suggests that the development of self-regulation skills is critical, then helping children develop self-regulation skills early will help increase the likelihood of (a) an equal opportunity to learn and (b) positive outcomes for all. Behavioral self-regulation, as addressed here, is distinct from emotional regulation, or the regulation of social-emotional responses to stimuli; social-emotional regulation is also important for educational outcomes (Eisenberg, Spinrad, & Smith, 2004).

Importance of social-emotional skills. Self-regulation and socio-emotional behavior appear to work in concert to predict academic success. As children learn to identify how they feel and describe feelings of emotions, behavioral regulation emerges.

Prior research has found that children who are more socially and emotionally able in preschool are likely to enjoy success in academic and social areas in the future (Landry & Smith, 2010). Children who lack social-emotional competence in preschool are more likely to experience transition problems into kindergarten, be unprepared academically, manifest a number of social and behavioral problems in grade school, and exhibit long-term problems academically and socially (Bornstein, Hahn, & Haynes, 2010). Children entering kindergarten with poor social-emotional behaviors often demonstrate similar problems, including low levels of academic achievement, peer rejection, and behavioral problems (Alexander, Entwisle, & Dauber, 1993; McClelland et al., 2000). Therefore, it is important that screening of early childhood behavior include measures designed to monitor social-emotional development.

In the early years, children develop self-awareness and learn to regulate what they feel, allowing them to control emotions. Perspective taking, which is the ability to understand and be empathetic to others, also develops during this time period (Colwell & Hart, 2006). In addition, the emergence of social emotions of pride, shame, and guilt reflect a child's perceived sense of competence or incompetence relative to others (Kostelnik, Whiren, Soderman, & Gregory, 2009). Experiencing the emotions of shame and guilt can motivate a child to make changes so that he or she will be less vulnerable to these feelings in the future (Leary, 2001). Between three to six years of age, children establish a sense of personal strengths and weaknesses and begin to understand acceptable and unacceptable behaviors as learned through interactions with others (Bagnato, 2007)

Emotional understanding and perspective taking are components of developing emotional competence, which is considered an important component of social competence (Denham, 2006; Denham et al., 2003). Also, children who understand and are able to balance positive and negative emotions and respond more pro-socially to peers' emotions are seen as more likable by their peers and rated higher in social competence (Denham et al., 2003; Garner, 2006). Thus, the development of socio-emotional competence requires skills that promote emotional recognition and regulation, empathy for others, problem-solving, and positive social interactions (Denham, 2006). Social development literature suggested that teacher effects on behavior are likely larger for younger students than they are for older students (Campbell et al., 2012). Social behaviors appear most malleable in early childhood (Campbell et al., 2012; Hawkins, Kosterman, Catalano, Hill, & Abbott, 2005; Stiles, 2000). Self-regulation and socio-emotional behavior appear to work in concert in predicting academic success.

Interplay between self-regulation and social-emotional behavior with academics. Research underscoring linkages between problem behavior and poor academic performance is plentiful, and the implications for practice are complex. Collectively, empirical findings provide evidence of the intertwined, and likely reciprocal, nature of the problem behavior/achievement association (Fleming, Harachi, Cortes, Abbott, & Catalano, 2004). More specifically, evidence indicates that key components of self-regulation and social-emotional behavior predict academic achievement both before kindergarten and throughout school (Blair, Zelazo, & Greenberg, 2005; Liew, McTigue, Barrois, & Hughes, 2008; McClelland et al., 2006; McClelland et al., 2007; McClelland et al., 2000).

Studies exploring relationships between problem behaviors and academic performance have used diverse approaches to define (and subsequently measure) problem behavior. Definitions range from broad single-dimension constructs, such as the ability to attend, a self-regulatory process (e.g., Al Otaiba & Fuchs, 2006), to more fine-grained categorizations of problem behaviors (task avoidant, socially dependent, socially avoidant, depressed, phobic, anxious, argumentative or inappropriate with their peers) and their respective roles in predicting academic outcomes (e.g., Morgan, Farkas, Tufis, & Sperling, 2008).

Several investigations examined the independent contributions of social-emotional and self-regulating behaviors to academic achievement and concluded that self-regulating problem behaviors were more strongly associated with poor academic outcomes (Nelson, Benner, Lane, & Smith, 2004; Nelson, Benner, Neill, & Stage, 2006), with higher behavioral regulation related to higher school readiness (Wanless et al., 2013). Yet, some researchers noted that students with social-emotional problem behaviors also had lower academic outcomes relative to students with behaviors regarded as normal (Harris, Oakes, Lane, & Rutherford, 2009). Others acknowledged the comorbidity of self-regulating and social-emotional problem behaviors, suggesting that behavior problems in these two areas are likely to occur together (Halonen, Aunola, Ahonen, & Nurmi, 2006).

The positive relation between problem behaviors and reading difficulties is particularly well-documented (Al Otaiba & Fuchs, 2006; Morgan, 2008). Specifically, Morgan et al. (2008) found that first-grade reading problems predicted third-grade problem behaviors, including acting out, withdrawing from classroom activities, poor

self-control, and task avoidance. It should also be noted, however, that this relation isn't found with respect to all behavioral skill areas. For example, with the exception of task engagement, none of the problem behaviors measured in first-grade (i.e., poor self-control, poor interpersonal skills, externalizing problem behaviors, internalizing problem behaviors) predicted third-grade reading problems.

Nelson, Benner, and Gonzalez's meta-analysis (2003) documented problem behaviors as one of the strongest predictors of poor reading outcomes. Likewise, Al Otaiba and Fuchs's (2006) study of children who were responsive versus nonresponsive to reading intervention found substantial differences between the two groups on measures of classroom problem behaviors. Whether it is acquiring pre-literacy skills or evolving basic behavioral abilities, these early learning opportunities can help children to excel in later academic situations (Speece, Ritchey, Cooper, Roth, & Schatschneider, 2004; Stage, Abbott, Jenkins, & Berninger, 2003). Determining the relation between self-regulatory and socio-emotional behavior skills and academics will continue to be critical as Oregon moves forward with determining exactly what readiness for kindergarten looks like, and how it should be assessed.

Assessment of Young Children's Behaviors

The reliability and validity of assessments used with infants, toddlers, and young children is critical to help accurately identify and support students with behavioral difficulties to develop skills necessary for academic success. Early identification of behavioral difficulties and appropriate interventions may prevent identification for special education and decrease the likelihood of possible future incarceration (Squires, Bricker, Heob, & Twombly, 2001). The transition from preschool to kindergarten is an

important stage for measuring receptivity and readiness for future education and learning at school. Because preschool children acquire knowledge and information rapidly, it would be best to research the relation between early childhood education readiness (kindergarten entry) and later school performance (Kamps et al., 2003). Early identification of preschool problem behaviors and effective interventions (academic and behavioral) continues to be a focus of early childhood research (Heckman & Krueger, 2004; McClelland et al., 2006).

There are few measures of behavioral regulation and social-emotional development for children transitioning to school that reliably assess key behavioral skills, the nature of self-regulation, and show distinct predictive validity for school success and achievement (Blair et al., 2005; Carter, Briggs-Gowan, & Davis, 2004). Further, research has shown each behavioral assessment has inherent measurement error and the true state of the child is actually never known, but is only approximated (Andersson, 2004; Griffith, Nelson, Epstein, & Pederson, 2008). The standardized behavioral assessments that do exist are commonly used for research and eligibility decisions in early intervention/early childhood special education settings (Gleason, Zeanah, & Dickstein, 2010). The assessments are thus often high stakes, increasing the need for strong technical adequacy.

Effective screening drives effective interventions, wherein screening relates directly to curriculum and intervention in an integrated fashion to continuously inform teaching and learning (NAEYC, 2009). For example, universal screening completed by a variety of stakeholders, such as the CBRS (Bronson et al., 1990) or the Ages and Stages Questionnaire (ASQ-3; Squire & Bricker, 2009), might be utilized at the beginning of a given school year to assess children on their level and acquisition of behavioral

development milestones. Such screening might also then provide valuable insights into students' instructional and behavioral needs.

Nuances in measuring young children's behavior. Multiple measures of behavior may best illuminate how differences in behavioral regulation and social skills relate to achievement. Duckworth and Seligman (2006) found discrepancies in the size and significance of gender differences in self-control across different measures in their study (i.e., an objective measure vs. parent and teacher reports). Freeman (2004) showed that although gender differences in academic achievement exist in early elementary school, performance on assessments in general knowledge, overall reading, and overall mathematics is similar between boys and girls in kindergarten and the first grade.

Though results may vary – and even be contradictory – a multi-method, multi-source, and multi-informant approach may be ideal in the early childhood setting because of the importance of home and school settings as well as the child's inability to provide self-report (Caselman & Self, 2008). In addition, a multi-gate, or tiered, approach to measuring behavior has proven effective for correctly identifying behavioral difficulties (Simonsen & Bullis, 2007; Walker et al., 1994).

As the importance of early detection of social-emotional and self-regulatory competence is increasingly recognized and schools attempt to measure kindergarten readiness, assessments to assist in effective early identification are critical (Shonkoff, Phillips, & Keilty, 2000; Zeanah, 2000). Successful early identification can save important resources associated with behavioral problems in terms of remediation and the cost of re-teaching appropriate behaviors or replacement behaviors (Simonsen & Bullis, 2007; Walker et al., 1998). Adequate early identification of problem behaviors may

impact delinquency rates, incarceration, improve early relationships, and overall developmental paths for young children (Heckman & Krueger, 2004; Walker et al., 1998; Zeanah, 2000).

Possible bias of respondents (unskilled/unaware). Teacher and parent reports are traditional methods (and sources) of measuring self-regulation and social-emotional behaviors in the early school years (Duncan, 2007). Teachers have long been the primary source of academic ratings of students and kindergarten teachers' ability to predict future academic performance have been significantly correlated with outcome measures (Teisl, Mazzocco, & Myers, 2001). These measures may be susceptible to observer bias. For example, controlling for other measures of performance, teachers have been shown to rate boys lower than girls on achievement and behavior (Beaman, Wheldall, & Kemp, 2006). Other research indicates measures of a given child's behavior are often moderately related between mothers and fathers, and comparisons between parents' and teachers' ratings can yield quite different results (Achenbach, Howell, McConaughy, & Stanger, 1995; Konold, Walthall, & Pianta, 2004).

Parents may display some form of functional overconfidence (halo effect) when discussing the behavioral skills of their own children. Subjective overconfidence may naturally shield some parents from focusing on their own parenting skills and efforts to build positive behaviors in their offspring (Dunning, Johnson, Ehrlinger, & Kruger, 2003). However, research shows that parental concerns are reliable and valid in developmental screenings (Tervo, 2005). Parental concerns about behavior and social skills are also strong predictors of mental health problems (Glascoe, 2003).

Blind spot bias or failing to compensate for personal cognitive biases (not knowing what we do not know or unskilled/unaware) may account for the fact that it is often difficult to recognize inappropriate behaviors that have long been ignored inside family schema (Pronin & Kugler, 2007). Preschools may also be unaware that behavioral readiness may be more important than academic readiness in kindergarten (Heckman & Krueger, 2004).

Research indicates that individuals tend to over-report socially desirable features of close family members and under-report socially undesirable ones (Williams & Gilovich, 2012). Thus *better than average* bias may be a contributing factor when parents are rating their own children's behavior. A contributing factor to parental bias may be nested inside individual parent's behavioral expectations. Downplaying the faults of children and exaggerating some above average effects also proved problematic for parents while trying to realistically evaluate the level of performance of their child's behavioral skill (Dunning et al., 2003). Given the possibility of bias coupled with the importance of multi-faceted approaches to measuring behavior and academics, it seems appropriate to take a nuanced view of assessing kindergarten behavioral readiness.

Outcomes Associated with Behavioral Assessment

Clearly behavioral assessments in early childhood are important and related to self-regulation, social-emotional skills, and academic performance. Such assessments, however, are also quite sensitive to various confounding effects and biases, whether from teachers or parents. Ideally, such assessments would be direct measures of behavior though primarily they include judgments and rely on inference. And as Messick (1995) cautions even the use of the terminology *direct assessment* (of task behaviors), is

generally inappropriate, especially in the social sciences. Behavioral assessments can only purport to measure the construct of behavior and still require convergent and discriminate evidence to combat threats to construct validity, namely, construct under-representation and construct-irrelevant variance (Messick, 1995). Furthermore, recent definitions of validity emphasize decision-making with the use of measures. One important element of test validity then includes some indication of intended and unintended consequences of behavioral assessments. Evidence of intended and unintended consequences both positive for teaching and learning as well as potential adverse consequences of bias and fairness should be reported.

For example, behavioral screeners can be used to divide children into two populations of risk and no risk. Children who fall below expectant behavioral readiness levels would then be more closely monitored, administered more focused diagnostic assessments, and/or selected for more intensive instruction through a tiered behavioral instruction approach targeting time, frequency, duration, and instructional groupings (Wanzek & Cavanaugh, 2012). Deficits in social-emotional competence, self-regulatory behaviors, and behavioral adjustment might then be targeted for intervention using a tiered approach as outlined in the Positive Behavioral Interventions & Supports (PBIS) model (U.S. Department of Education's Office of Special Education Programs, 2015) and the Response To Intervention (RTI) model (Barnett, VanDerHeyden, & Witt, 2007; McCabe, 2006, 2009). Ideally, interventions would be empirically supported; ideally, the evidence base would include efficacy research with a variety of disabilities, populations, and referral concerns at each instructional tier (Barnett et al., 2006).

The CBRS is an example of a behavioral screening tool that is intended to measure behavioral self-regulatory skills, such as following directions and completing tasks, along with items measuring social-emotional behaviors like taking turns, sharing, and cooperating. The CBRS is one component of the Oregon KA, required to be collected on all Oregon kindergarten students starting in the fall of the 2013-2014 school year. The CBRS (Oregon selected 15 items from the CBRS and called it the "Approaches to Learning Assessment") has been show to be predictive of academic performance (Bronson, Tivnan, & Seppanen, 1995; Matthews, Ponitz, & Morrison, 2009; McClelland et al., 2006; McClelland et al., 2007; McClelland & Morrison, 2003).

The results of the CBRS could be useful to educators in deciding how to affect behavioral readiness but needs validation research to support decision-making (particularly in grouping students into risk categories). In an effort to define school readiness, my study utilizes pre-post measures of social-emotional and self-regulatory behaviors, as well as direct student measures of academics performance. My research extends that completed by Tindal, Irvin, and Nese (2013) in their Oregon's 2012 KA pilot data, where they document that school readiness may be more social-behavioral than academic.

My study analyzes behavioral readiness factors (behavioral self-regulatory skills and/or social-emotional development) from the CBRS and attempts to classify readiness as *student may need further assessment* or student appears to be *typically behaviorally developing* using an empirically established cut score. The CBCL and the ASQ:SE serve as the criterion measures for helping determine and proposing an appropriate cut score on the CBRS. Parent ratings of children's behaviors will be compared to teacher ratings in

an effort to determine the appropriateness of soliciting parents as respondents to measure their children's behavioral readiness for kindergarten.

My study seeks to answer the following research questions:

1. Is the CBRS a reliable measure of behavior and if so, is there a significant difference between parents and teachers as respondents on the CBRS?
2. Based on sensitivity and specificity (ROC analysis), what is an appropriate cut score on the Child Behavioral Rating Scale (CBRS) using the CBCL, ASQ:SE, and easyCBM risk as the criterion measures, to separate the CBRS into two dichotomous categories; *Student is typically developing*, or *Student may be in need of further assessment*?
3. How well do kindergarten teachers' predictions of student academic and behavioral readiness align with the proposed CBRS cut score?
4. Based on the CBRS cut score, how well can we predict 'point in time' academic risk in the fall and spring on easyCBM measures?
5. What is the gain change (delta) over time (kindergarten year) in student behavioral performance on the CBRS from fall to spring?

CHAPTER II

METHODOLOGY

My study documents three outcomes: (a) evaluation of optimal cut scores on the CBRS, relative to the CBCL 'Total Problem' classification score and ASQ:SE cut score: (b) evaluation of parents as respondents on the CBRS; and (c) predictions risk for low academic performance of students scoring above and below the CBRS cut point. Following is a description of the research setting, participants, study procedures, measures used, and analyses used in documenting these outcomes.

Setting, Participants and Procedures

All participants involved in my research study resided in one district in Oregon. Extant archival data were used and therefore, data were limited to what was collected by the study conducted in the district. The respondents in the first year of my study (2013-2014) were parents and teachers of students who entered kindergarten during the fall of the 2013-2014 school year. Teachers (n = 379) and parents (n = 297) responses to **t**he Child Behavioral Rating Scale (CBRS) were collected the first four to six weeks of school at kindergarten entry in the fall of the school year. Table 1 describes 2013-2014 student demographics by race, gender, economically disadvantaged, limited English proficient, and students with disabilities categories. The table reports average ratings for sub-groups on self-regulation and interpersonal skills. A representative sample of parents and teachers (n = 219), stratified by demographic representation of Title I and non-Title I qualifying elementary schools and a combination of large (total population >500) and small (total population <250) elementary schools, also completed the Child Behavioral Checklist (CBCL).

Table 1

2013-2014 Child Behavioral Rating Scale

Group	*n*	SR Average Rating (1 - 5)	IS Average Rating (1 - 5)	Total Average Rating (1 - 5)
Total	379	3.5	3.7	3.6
Subgroup				
Hispanic	54	3.5	3.7	3.6
Multi-Ethnic	18	4.0	4.1	4.0
White	299	3.5	3.7	3.6
Female	186	3.7	3.9	3.8
Male	193	3.3	3.5	3.4
Econ. Disad.	236	3.4	3.6	3.5
LEP	17	3.4	3.8	3.5
Disability	33	2.9	3.3	3.0

Note. SR = Self-regulation scale; IS = Interpersonal Skills scale.

Both behavioral screening and assessments (CBRS and CBCL) were completed within the first five weeks of school in compliance with the State of Oregon's Kindergarten Assessment timeline guidelines. Over the course of the 2013-2014 school year district teachers administered easyCBM literacy and math measures to all kindergarten students (n = 379) in the fall, winter, and spring. During the spring of the 2013-2014 school year district teachers re-administered the CBRS to parents (n = 149) and retook the survey (n = 318).

Table 2 describes 2014-2015 sample student demographics by race and gender. The table reports average ratings for sub-groups on self-regulation and interpersonal skills. During the first four to six weeks of the 2014-2015 school year the district collected the CBRS from parents (n = 215) and teachers (n = 355). During the same four to six week window of the 2014-2015 school year the district also collected the ASQ:SE from parents (n = 124).

Table 2

2014-2015 Child Behavioral Rating Scale

Group	*n*	SR Average Rating (1 - 5)	IS Average Rating (1 - 5)	Total Average Rating (1 - 5)
Total	355	3.5	3.8	3.6
Subgroup				
Hispanic	68	3.4	3.8	3.5
Multi-Ethnic	17	3.4	3.6	3.5
White	265	3.5	3.9	3.6
Female	183	3.8	4.1	3.9
Male	172	3.2	3.6	3.3

Note. SR = Self-regulation scale; IS = Interpersonal Skills scale.

Table 3 reports the number (n) of kindergarten students participating in each of the five elementary schools across the two years of this study. CBRS building average scores are reported along with Special Education building population percentage, free and/or reduced meal rate and minority population percentage.

Table 3

CBRS Averages for the 13/14 and 14/15 Test Administrations with Demographics

Elem. School	*n* 13/14	*M* 13/14	*n* 14/15	*M* 14/15	FRL %	Sped %	Min %
School 1	104	3.5	96	3.6	79.0	19.0	35.0
School 2	95	3.7	67	3.6	42.1	12.0	14.0
School 3	84	3.4	89	3.4	68.9	19.0	31.0
School 4	53	3.6	48	4.0	82.9	19.0	13.0
School 5	43	3.9	52	3.6	79.2	15.0	23.0
Total	379	3.6	352	3.6	70.4	17.0	23.0

Note. Reported means are averages on the five-point Likert scale for the CBRS.
FRL = Free/reduced lunch; Sped = Special education; Min = Minority student.

Table 4 further describes the research district's sample student population by race, in comparison to Oregon and the United States. Results displayed are in percentages of the population sampled.

Table 4

Racial Demographics by District, State and Nation

Race	District %	Oregon %	US %
White	94.90	88.30	77.90
Two or More Races	2.60	3.50	2.40
Hispanic or Latino	8.60	12.20	16.90
White, not Hispanic or Latino	88.30	77.80	63.00

All 10 teachers were female and identified as White/ Non-Hispanic. Teachers in this study averaged 38.8 years of age with a range from 24 to 51 years of age. The average number of years teaching experience was ten years, with a range of 1 to 20 years experience. The average teacher salary was $56,609 and ranged from $41,119 to $66,775 a year. The highest level of educational attainment amongst the teachers averaged a master's degree level plus 60 additional credit hours, with a range of educational attainment from a master's degree plus 45 additional credit hours to a master's degree plus 75 additional credit hours.

Parent socio-economic status for parents included in the study is the same as the Free and/or reduced lunch results reported in Table 3, as the determination was made based on parent income. Table 5 reports parents' highest level of educational attainment.

Table 5

Percentage of Highest Level of Parent Educational Attainment

Parent subgroup	%
Less than 9th grade	2.8
9th to 12th grade, no diploma	8.7
High school graduate (or equivalency)	35.8
Some college, no degree	27.3
Associate degree	7.7
Bachelor degree	11.4
Graduate or professional degree	6.3

Analysis of Variable Relations

The individual kindergarten student's scores (as they enter kindergarten in a district in Oregon the first 4-6 weeks of school, in the Fall of 2013-2014 and 2014-2015 school years) were the unit of analysis. As described in Babbie (2010), kindergarten student scores were aggregated to make generalizations about the group population. The concept of validity pertains to the accuracy with which a procedure measures what it is supposed to measure (Babbie 2010). According to Messick (1995), "validity is an overall evaluative judgment of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of interpretations and actions based on test scores or other modes of assessment" (p. 741).

Measures

The technical adequacy of the criterion measures is reported from both technical manuals and research articles. The CBRS (adapted to become the ATLA in the Oregon KA) is described first, followed by the CBCL, then ASQ:SE, and lastly the easyCBM measures.

The Child Behavior Rating Scale. The CBRS requires teachers and parents (as respondents) to rate children on practical behaviors, such as following instructions and completing and persisting on classroom tasks. These behaviors require regulating responses based on cognitive skills, including remembering instructions (connected to working memory), focusing on the task at hand (attention), and completing one task before moving onto another (inhibitory control).

CBRS scores have a reported test–retest reliability of .67 and an internal consistency (Cronbach's α) of .96 (Associates, 1988). Research by Goodwin (1980) and Seppanen (1993) note that the CBRS has strong construct as well as concurrent validity through its strong factor structure, which accounted for a large proportion of the variance, and its correlation (r = .43) with the Bronson Social Task and Skill Profile, an observational measure of goal-orientation in classroom settings (e.g., planning, organizing, mastery, interacting cooperatively). Furthermore, the CBRS has been used for evaluations of Head Start and Giant Step, as well as a number of other individual preschool programs (Associates, 1988; Bronson et al., 1995; Meleen, 1988).

Fifteen items from the CBRS were used to construct the ATLA used in Oregon. See Appendix A for a full list of the 15 items on the ATLA. The CBRS (Bronson et al., 1995) is based on the Bronson Social Task and Skill Profile (Bronson, 1991), an observational instrument designed to assess children's classroom goal-oriented behaviors and strategies used to regulate behavior in academic and social situations; the measure also contains items on social relations with peers and adults (Bronson, 1994; Schunk, 2001). Sample items include, "Completes learning tasks in an organized way," "Observes rules and follows directions without requiring repeated reminders," and, "Sees own errors on task and corrects them." Items are rated on a 5-point Likert scale from 1 (never) to 5 (always). ODE reports school average scores to school districts, based on two constructs: (a) the average of the first ten questions (Self-regulation), and (b) the average score on last five questions (Interpersonal Skills).

Tindal, Irvin, and Nese (April 2013) analyzed items of the pilot ATLA data using Exploratory Factor Analysis (EFA) with the selected 17 items from the behavior rating scale. Items on the rating scale loaded primarily on two factors, termed *task behavior* (self-regulatory skills) and *social behavior* (social-emotional skills). Fifteen of the 17 items factored into these two categories. ODE dropped two of the piloted items from the behavioral rating scale and agreed on 15 items for the 2013-2014 kindergarten assessment.

Two items from Oregon's pilot study relating to *expressing hostility* both verbally and physically were eliminated. Even though this research study added these items back on the parent and teacher questionnaires, the two dropped items were excluded and not analyzed in order to maintain consistency with ODE's approach. A total raw score was calculated and used as the unit of analysis in this study. The total raw score was analyzed to develop a single cut score for the CBRS to differentiate between students who *may need further assessment* from those who are *typically developing* for kindergarten behavioral readiness.

Each kindergarten teacher in the district was required to complete the ATLA, based on observations of students in his or her classroom. During regular classroom activities, teachers familiarized themselves with students' behavior and, rated students on the 15 items related to self-regulation and interpersonal skills using the CBRS. Teachers were given 4-6 weeks with students before they rated the students' behavior. Parents have roughly five years of behavioral knowledge to draw on when assessing student behavior, albeit in different environments from those at school. Students were rated on a 1 to 5 point Likert scale on the CBRS measure using the following criteria:

1. The child *never* exhibits the behavior described by the item.
2. The child *rarely* exhibits the behavior described by the item.
3. The child *sometimes* exhibits the behavior described by the item.
4. The child *frequently* or *usually* exhibits the behavior described by the item.
5. The child *always* exhibits the behavior described by the item.

Possible scores on the CBRS range from 15 to 75 points.

The Child Behavior Checklist. The current version of the Child Behavior Checklist (CBCL/6-18) (Achenbach & Rescorla, 2001) is an update of the previous edition of the school-age CBCL/4-18 (Achenbach, 1991). The primary difference between the CBCL/4-18 (older version) and the CBCL/6-18 (current version), hereto referred to as the CBCL, is updated normative data and a change in the lower limit of the age range. Whereas the previous version included ages 4 and 5, those ages are now covered by the CBCL/1.5-5 (Achenbach & Rescorla, 2001). The authors noted that "most children's scores would rank at nearly the same level on the new and 1991 versions", (p. 166) and "if a child's functioning has not changed much between assessments on the 1991 and newer versions of the behavioral assessment, the child's syndrome scores should be equivalent to about the same percentile and T-scores on each version" (Achenbach & Rescorla, 2001, p. 166).

The Achenbach System of Empirically Based Assessment (ASEBA; Achenbach & Rescorla, 2001), which includes the CBCL, is a syndrome-based scale that includes two parts, one assessing the child's social competence and the other assessing his or her emotional and behavioral problems. The CBCL is a widely used broad-band behavior-rating scale, often used in the school and clinical setting (Achenbach & Rescorla, 2001).

The CBCL contains 118 items that differentiate the child's behavior into three dimensions: Internalizing Problems, Externalizing Problems, and Total Problems. The CBCL/6-18 also includes eight finer-grained syndrome dimensions; (a) Aggressive Behavior, (b) Anxious/Depressed, (c) Attention Problems, (d) Rule-Breaking Behavior, (e) Social Problems, (f) Somatic Complaints, (g) Thought Problems, and (h) Withdrawn/Depressed. For efficient dichotomous discrimination between students at risk, as identified by the CBCL, the clinical range of classifying T scores ≥ 60 on the Total Problem score is used here.

During the CBCL assessment, parents or guardians are asked to reflect on the child's behavior during the previous six months and respond to each of the 118 items using a 3-point scale: 0 = not true, 1 = somewhat or sometimes true, and 2 = very true or often true (Achenbach & Rescorla, 2001). For this study, parents (usually the mother) completed the CBCL for their student(s) concurrent with completing the CBRS.

The CBCL manual provides information to assist practitioners in interpreting the data for youth who are not clearly in the clinical range but may be exhibiting behavior or affect of concern (Achenbach and Rescorla, 2001). Appendix B shows the 118 items from the CBCL and their corresponding syndrome factor. The Total Problem behavior score from the CBCL syndrome categories is predicted to have a strong relation to the CBRS.

Achenbach and Rescorla (2001) reported that the CBCL scales have demonstrated adequate reliability and validity. For the syndrome scales and overall problem behavior scales (Internalizing, Externalizing, and Total Problems), Cronbach's alpha ranged from .78 to .97, which are acceptable ranges when examining the usefulness of behavioral

rating scales (Tavakol & Dennick, 2011). To document reliability in both the rank ordering and magnitude of scale scores, Achenbach & Rescorla (2001) calculated Pearson correlations and *t*-tests differences between CBCL ratings of both referred and non-referred children at intervals of eight to 16 days. There were significant ($p < .05$) declines in scores on the Withdrawn/Depressed and Total Problems scales; however, the declines in scores were small, accounting for less than 3% of the variance in total scores. Cohen (1988) defined small effect sizes in *t*-tests as ranging from 1% to 5.9% of the variance, this indicates that effects of this magnitude (3%) were small. See Appendix C for test re-test reliability and alpha coefficients for the CBCL and TRF.

The standard score for the eight syndrome dimensions reflect a T-distribution with a mean of 50 and a standard deviation of 10. Scores in the range of 40-59 are considered to be in the average range. T-scores from Total Problems Scores between 60 to 63 are considered to be in the "borderline clinical range" because they are high enough to be of concern to warrant further investigation but not so high as to be clearly deviant as those in the clinical range (T-scores ≥ 65).

Cross-informant agreement. Achenbach and Rescorla, (2001) evaluated cross-informant agreement by comparing the CBCL completed by mothers and fathers of referred children, teacher reports (Teacher Report Form; TRF), and children's self-reports (Youth Self Report; YSR). All cross-informant correlations (Kappa) were significant at $p < .05$. The Pearson correlation between parents was .76 and between teachers was .60. See Appendix D for an adapted summary of the CBCL by TRF comparison of measures used in this study. For the combination of CBCL by YSR, the CBCL by TRF, and the YSR and TRF ratings, correlations ranged from .16 to .56.

Content validity. Content validity addresses whether a measure's content includes what it is intended to measure. The evidence for content validity for the CBCL/6-18 is extensive, with analysis of the item and scale scores well-documented and based on extensive literature reviews, consultation with mental health professionals and educators, and with parents and other caregivers (Achenbach, 1991).

Criterion-related validity. Criterion-related validity examines the relation between a measure and a criterion. Criterion validity has been evaluated in prior research on the basis of correlations with similar instruments, in particular the Behavior Assessment System for Children (BASC; Reynolds & Kamphaus, 1992), the Conners' Rating Scales-Revised (CRS-R; Conners, 1997), and the DSM-IV Checklist (Hudziak, 1998). Correlations with the Conners' Rating Scales were high, ranging from .71 to .85 and the DSM-IV Checklist were moderate, ranging from .43 to .80; correlations with the BASC were varied, ranging from .38 to .89 (Achenbach & Rescorla, 2001). The CBCL technical documentation provided evidence for significant associations with analogous scales of other instruments and with DSM criteria; and by predictions of long-term outcomes supported by four decades of research (Achenbach & Rescorla, 2001). Further findings indicated that all items discriminated significantly ($p < .01$) between demographically matched referred and non-referred children (Achenbach, 1991). In this study the CBCL and ASQ:SE serve as the behavioral criterion measures and easyCBM measures for the academic criterion measures to the CBRS.

Construct validity. A test's construct validity is the degree to which the test measures the theoretical construct or trait that it was designed to measure (Allen & Yen, 1979). Evidence of construct validity using the CBCL, YSR, and TRF is based on

ASEBA's prior research using multiple regression analyses and indicates that 2-33% of the variance on individual scales is accounted for by referral status. Additional validity evidence on classification accuracy emerges from referral status, using discriminant analysis procedures (79-85%; Achenbach & Rescorla, 2001; Flanagan, 2005). In the development of the current version of the CBCL, Achenbach and Rescorla (2001) omitted two problem items that failed to discriminate significantly between referred and non-referred children (i.e., allergy and asthma).

Ages and Stages Questionnaire: Social Emotional. The primary focus of the 60 Month ASQ:SE are *emotional competence*, or the ability to effectively regulate emotions to accomplish one's goals, and *social competence*, or an array of behaviors that permits one to develop and engage in positive interactions with peers, siblings, parents and other adults (Squires, Bricker, & Twombly, 2003). The ASQ:SE is divided into seven behavioral areas: Self Regulation, Compliance, Communication, Adaptive Functioning, Autonomy, Affect, and Interaction with People. The ASQ:SE is reported on a raw-score scale, with items having three response options:

1. *Most of the time* – Indicating that the child is doing the behavior most of the time, too much, or too often.
2. *Sometimes* – Indicating the child is doing the behavior occasionally, but not consistently.
3. *Never or rarely* – Indicating the child rarely performs the behavior or has never performed the behavior.

Each item asks if there is a *behavior concern to the parents?* Parents are instructed to check one of the three scoring options and then indicate if the behavior is of concern. Each item marked as a concern to the parent is given additional weight. Items on each questionnaire are coded Z, V, or X and transferred to point values of 0, 5, or 10 respectively. Scores are summed for a total score and scores exceeding the established cutoff (70 < on ASQ:SE 60 months) are referred for a diagnostic evaluation.

ASQ:SE cutoff scores and classification statistics were developed using measures including the CBCL for criterion reference (Squires et al., 2003). For the 60 month ASQ:SE used in this study, sensitivity was 84.6% and specificity was reported at 94.5%. The false positive rate was 4.2% and the false negative rate was reported at 15.4%. The cut-off score ASQ:SE 60 month was ≥70 and this cut score was used as the criterion for this study. Percent agreement between questionnaires and standardized assessments/disability status was 94%. Under-referral rate was reported as 2.4% and over-referral rate at 3.6% (Squires et al., 2003). Internal consistency was high, with an Cronbach's alpha of .91, and test-retest reliability for ASQ:SE questionnaires completed by parents at one to three week intervals was .94 (Squires et al., 2003).

easyCBM Letter Names and Letter Sounds Fluency. Measures of alphabetic principles—Letter Names, Letter Sounds, Phoneme Segmentation, and Word Reading Fluency—serve as the indicators of academic readiness in this study, along with a measure of Early Numeracy (described next). All measures of academic readiness were administered during the fall, winter, and spring of the kindergarten school year (2013-2014). The fall measures served as the academic readiness measure (beginning of kindergarten school year), while the spring measure served as an indicator of end-of-year

academic competency. Fall and spring scores on the easyCBM measure were analyzed in relation to the CBRS cut score to predict academic risk.

The Letter Names and Letter Sounds measures test students' ability to name and sound out letters of the English alphabet, respectively, both in their lower- and upper-case forms. In these individually administered measures, students are shown a series of letters organized in a chart on one side of a single sheet of paper and given 60 seconds to name/sound as many letters as they can. The teacher follows along as the student responds, indicating each letter the student responds to incorrectly in the scoring protocol, and prompting the student to move on if she hesitates at a letter for more than three seconds, with non-responses scored as incorrect. Student self-corrections count as correct responses. At the end of 60 seconds, the teacher marks the last letter responded to and calculates the total number of letters responded to correctly to arrive at the student's 'per minute' fluency-based score (Alonzo & Tindal, 2007).

easyCBM Early Numeracy. The easyCBM early numeracy measures are based on the National Council of Teachers of Mathematics (NCTM) Curriculum Focal Point Standards in Mathematics. The easyCBM kindergarten focal point standards specifically include; Numbers and Operations, Geometry, and Measurement. In a study investigating the technical adequacy of the easyCBM early numeracy measures, Anderson et al. (2010) reported Cronbach's Alpha at .83 for the fall benchmark assessment and .87 for spring. Results for criterion-related validity were .39 to .54 and split-half reliability (Spearman-Brown Analysis) of the NCTM math measure for Grades K-8 was reported at .80 in the fall and .82 in the spring.

Analyses

Three main analytic strategies were used to answer the research questions posed in this study and are described, including reliability, receiver operating characteristic, and gain score analyses.

Cronbach's alpha. The first question is whether the CBRS is a reliable measure of behavior. Reliability or internal consistency is measured with Cronbach's α, where the theoretical value of α varies from 0 to 1, because it is the ratio of two variances. Cronbach's α generally increases as the intercorrelations among test items increase, and is thus known as an internal consistency estimate of reliability of test scores. Because intercorrelations among test items are maximized when all items measure the same construct, Cronbach's α was used to indicate the degree to which each set of behavioral items measures a unidimensional latent construct. In this study, internal consistency for the analytic sample was compared to Cronbach's α reported in previous studies to gauge reliability.

Following up on the first research question, significant differences between parents and teachers as respondents on the CBRS are documented. More than just reporting descriptive results, an independent samples *t*-test (pairwise deletion) is used to determine whether parents as respondents on the CBRS were the same or different from teacher respondents. A *t*-test is a statistical analysis that checks if two means (averages) are reliably different from each other.

Receiver Operating Characteristic Analyses. I used a receiver operating characteristics curve (ROC) analysis to determine whether an appropriate cut score on the CBRS could be determined using the CBCL and ASQ:SE as the criterion measures. The

cut score was established with the intention of separating CBRS total scores into two dichotomous categories: *Student is typically developing* (above the cut score), or *Student may be in need of further assessment* (below the cut score). Optimal cut scores that maximized sensitivity and specificity (true positive, true negative, false positive, false negative rates) were determined based on each administration of the CBRS (2013 fall, spring, and 2014 fall) across criterion measures (CBCL and ASQ:SE).

The fall 2013 CBRS total score was ROC analyzed with CBCL Total Problem syndrome scale score (0 = not at risk at <60; 1 = at risk ≥60) as the criterion measure cutoff. Lower CBRS scores indicate higher potential risk for CBCL Total Problem syndrome cutoff score. Separate analyses were run with each measure for both parent and teacher respondents. ROC analyses were also conducted with the CBRS cutoff criteria (44.5) and kindergarten teacher *predictions* of student behavior and academics risk (student will or will not be at risk for future academic (reading) or behavior problems in third grade). Fall 2014 CBRS total scores were also ROC analyzed with ASQ:SE results (0 = not at risk <70; 1 = at risk ≥70), using the ASQ:SE total sum score as the criteria cutoff. Lower CBRS total scores were associated with higher potential for behavioral risk.

The ROC analysis is a signal-detection test used to evaluate diagnostic measures. The ROC analysis computes quality indices of the *sensitivity* and *specificity*, allowing identification of the optimal (value-based judgment where sensitivity and specificity are maximized for intended purpose) cut score that identifies two groups that differ on the outcome of interest (O'Hara et al., 2005). In the case of the CBCL and ASQ:SE, presence of a clinical diagnosis or presence of behavioral risk, is the outcome. The

CBRS is the predictor of the CBCL classification and ASQ:SE risk. This research attempts to find the score on the CBRS that maximized the rate of correct classification for the CBCL and ASQ:SE criterion measures. Data were analyzed using SPSS 22 (SPSS, Chicago, IL). Alpha was set at 0.05 to minimize risk of Type I error.

Determining an optimal cut score requires researchers to balance classification accuracy with intended purpose and available resources. For example, raising the cut score will decrease the probability of false positives while increasing the probability of false negatives. Conversely, lowering the cut score will decrease the probability of false negatives while increasing the probability of false positives. Generally, false positives are considered less a problem because students misclassified as being at-risk or in need of further evaluation would be given an intervention or further assessment—the undesirable result being that resources are used when not needed. Alternatively, false negatives result in misclassifications where it is determined that a student is *not* at-risk or in need of further evaluation when they are —the undesirable result being that students in need of extra attention do not receive such support.

In my study, students' scores from Total Problem score on the CBCL were classified as falling into the clinical range (1) or not having a clinical range score (0). The scores on the ASQ:SE were coded as in need of further assessment (1) or typically developing (0). The ROC analysis was used to determine the optimal cut score on the CBRS using the CBCL and ASQ:SE as the criterion measures. Students were coded as typically developing (0) or in need of further assessment (1) on their CBCL Total Problem score ≥ 60 and on the ASQ:SE at a score of ≥ 70. These two independent classifications were then compared for the same student using the CBRS total score and

four possible outcomes were possible: (a) the CBRS and the criterion measure both classified the student as typically developing (i.e., true negatives), (b) the CBRS and the criterion measure both classified the student as in need of further evaluation (i.e., true positives), (c) the CBRS classified the student as typically developing, while the criterion measure classified the student as in need of further assessment (i.e., false negatives), and (d) the CBRS classified the student as in need of further assessment while the criterion measure classified the student as typically developing (i.e., false positives). See Appendix E for a visual example of ROC analysis and associated output table.

Students' scores by group (comparing students above and below the cut score) were further analyzed with easyCBM academic measures through ROC analysis. Two administrations over time (fall and spring in the kindergarten year) with the same group of students were analyzed to determine whether the CBRS cut score predicted academic risk using the easyCBM early literacy and early numeracy.

Gain score. The final research question inspected the difference (delta) between fall and spring results from parent and teacher ratings on the CBRS. Students' overall movement (gain) over the course of the kindergarten year was described by the difference in each total score fall to spring (e.g., $\Delta CBRS = CBRS_{spring} - CBRS_{fall}$). Movement across the cut score from fall to spring was also examined. Gain scores were calculated for both parent and teacher respondents. Movement around the cut score was analyzed by using the CBRS cut score to see how students' scores above and below the cut score compare fall to spring. Distributions for students within each possible pattern of movement around the cut score were also plotted, to allow for visual inspection of the overall change in scores.

CHAPTER III

RESULTS

This section is organized by research questions that focus on reliability, cut score determination, predictions, score change, and predictions with cut scores.

Research Question One – Reliability of CBRS

The internal consistency (Cronbach's α) of the CBRS, CBCL, and ASQ:SE are reported in Table 6. Across parent and teacher respondents and testing occasions, internal consistency was quite high, ranging from .89 to .98 for the CBRS for the sample in this study.

Table 6

Comparison of Group Statistics on All Administered Behavioral Rating & Assessments

Test Administration	*n*	*M*	*SD*	*Min-Max*	*α*
1314 CBRS Fall Teacher	379	53.85	11.40	15-75	.98
1314 CBRS Fall Parent	290	58.00	7.55	35-75	.89
1314 CBCL Teacher	127	14.57	17.26	0-79	*.97
1314 CBCL Parent	91	15.35	13.77	0-79	*.97
1314 CBRS Spring Teacher	315	54.70	11.18	15-75	.95
1314 CBRS Spring Parent	148	60.17	6.98	44-75	.90
1415 CBRS Fall Teacher	352	50.78	10.56	20-70	.97
1415 CBRS Fall Parent	214	56.46	8.12	29-75	.90
1415 ASQ:SE Parent	123	33.25	35.91	0-250	**.91

*As reported by Achenbach (1991).

**As reported by Squires et al. (2003).

The second half of Research Question One addressed differences in respondents (parents and teachers) on three administrations of the CBRS: fall and spring 2013-2014, and fall 2014. For the fall 2013 administration, teacher scores (M = 53.85, SD = 11.40) were significantly lower than parent scores (M = 58.00, SD = 7.55), $t(667) = -5.39$, $p < 0.001$. In the spring, scores reported by teachers (M = 54.70, SD = 11.18) were also significantly lower than parents (M = 60.17, SD = 6.98), $t(461) = -5.48$, $p < .001$. The effect was again replicated in the fall of 2014, with teachers (M = 50.78, SD = 8.12) scores being significantly lower than parent scores (M = 56.46, SD = 8.12), $t(564) = 5.68$, $p < 0.001$.

Research Question Two – CBRS Cut Scores

Table 7 displays the Area Under the Curve (AUC) for each test variable against each criterion variable. The optimal cut-score, which maximized sensitivity and specificity relative to the criterion, is also displayed, along with each accompanying statistic.

Table 7

Area Under the Curve for Selected CBRS Cut Scores by Criterion Measures

Test Variable	Criterion	AUC	Optimal Cut-Score	Sensitivity	Specificity
T-CBRS	TRF (CBCL)	0.82	45.5	0.86	0.84
P-CBRS	CBC (CBCL)	0.84	52.5	0.75	0.87
T-CBRS	ASQ:SE	0.74	46.5	0.63	0.83
P-CBRS	ASQ:SE	0.92	42.5	0.75	0.99
T-CBRS	T-Prediction Behavior	0.90	46.5	0.78	0.88
T-CBRS	T-Prediction Academic	0.83	46.5	0.60	0.84
Average		0.84	46.5	0.73	0.88

Note. T = Teacher results; P = Parent results.

Figure 1 displays a histogram of the Oregon Kindergarten CBRS summative scores from the fall 2013 administration. The distribution was negatively skewed (-.64), with a mean of 54.50, median of 56.00, and standard deviation of 12.63.

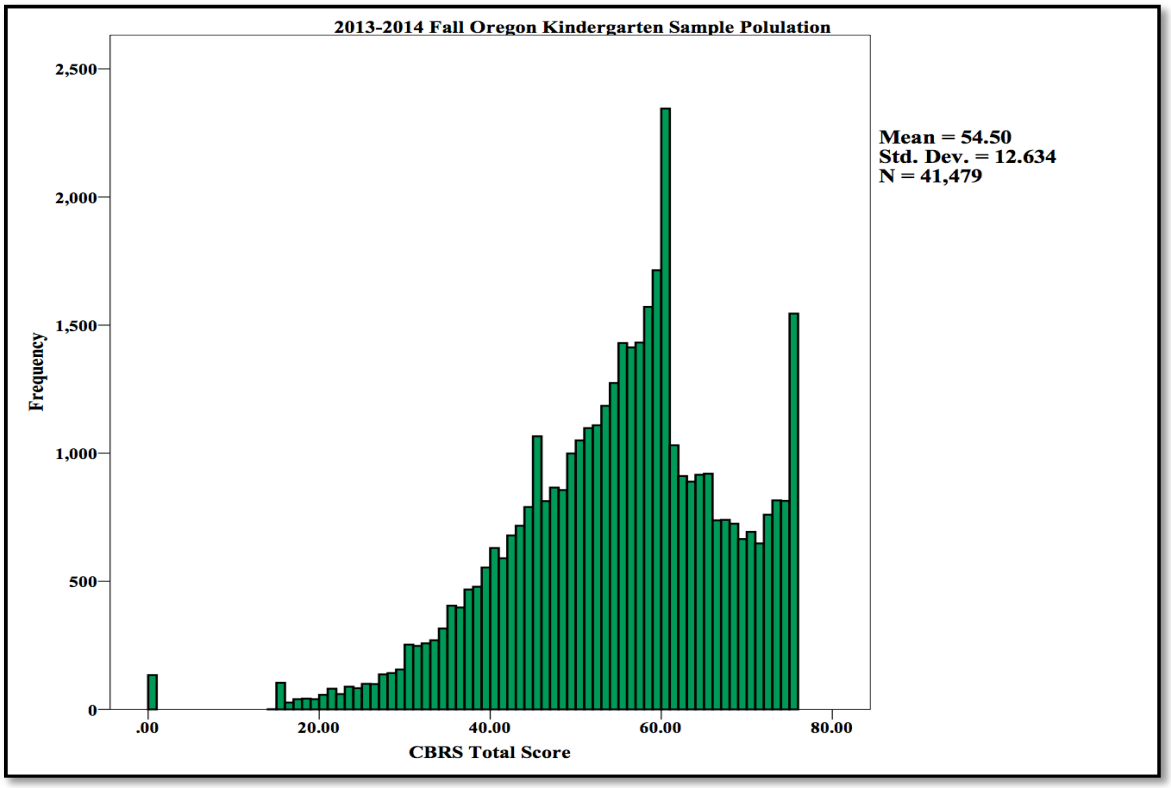


Figure 1. Histogram of Oregon kindergarten population score distribution 2013-2014.

Table 8 reports the 2013-2014 Oregon Kindergarten population (*n* = 41,479) CBRS total summative score and respective percentile rank. Mean score, confidence intervals, variance, and standard deviations are also reported in the table. The total Oregon Kindergarten Population percentile rank at the 20th percentile is associated with a CBRS Total Score of 44 and is bolded because of the particular interest in my research as it relates to my proposed cut score of 44.5. Both Response to Intervention (RTI) and Positive Behavioral Interventions and Supports (PBIS) approaches indicate that 80% of the general population will respond appropriately to universally available supports (U.S.

Department of Education's Office of Special Education Programs, 2015). The remaining 20% of school populations will need further evaluation for additional supports.

Table 8

Approaches to Learning Total Score Descriptive Statistics

Percentiles Rank Score	CBRS Total Score	Statistic	Bound	Results
5	32	Mean		54.50
10	38	Std. Error		0.06
15	41	95% Confidence	Lower Bound	54.38
20	**44**		Upper Bound	54.61
25	47	Median		56.00
30	49	Variance		159.62
35	51	Std. Deviation		12.63
40	53	Minimum		15.00
45	54	Maximum		75.00
50	56	Range		60.00
75	63	Interquartile Range		16.00
90	71	Skewness		-0.64
95	74	Kurtosis		0.70

Note. n = 41,479.

Table 9 reports teacher 2013 fall, 2014 spring, and 2014 fall, means, standard deviations, and standard errors of the mean for a cut score of 44.5. The table also reports the percentage of students at the 44.5 cut score who are classified as typically developing (above the cut score, > 44.5) and those who are in need of further behavioral evaluation (< 44.5).

Table 9

CBRS Teacher 2013 Fall, 2014 Spring, 2014 Fall, for 44.5 Cut Score

CBRS	Cutoff	*n*	%	*M*	*SD*	*SE*
13T-CBRS Fall	Total	379	100	53.85	11.40	0.59
13T-CBRS Fall	TD	295	78	58.41	7.92	0.46
13T-CBRS Fall	FE	84	22	37.81	5.90	0.64
14T-CBRS Spring	Total	315	100	54.70	11.18	0.63
14T-CBRS Spring	TD	242	77	57.74	9.14	0.59
14T-CBRS Spring	FE	57	23	42.68	10.41	1.38
14T-CBRS Fall	Total	354	100	53.80	12.45	0.66
14T-CBRS Fall	TD	274	71	58.89	8.03	0.49
14T-CBRS Fall	FE	80	29	36.38	8.54	0.95

Note. TD = Typically developing; FE = In need of further evaluation.

A ROC analysis was used to evaluate all possible cut scores on the CBRS. The cut score that maximized sensitivity and specificity ranged from 42.5 to 52.5, depending on the specific criterion variable. Each optimal cut score on CBRS parent and teacher ROC analysis with criterion measures (CBCL and ASQ:SE) was run as a crosstab to identify the counts and percentage of students above and below the cut score. The cut score on the CBRS that divided the entire Oregon sample into 80% typically developing and 20% in need of further evaluation was the 44.5 mark, which aligns with models for intervention (e.g., RTI, PBIS).

Table 10 reports the frequency and percentages of typically developing or in need of further evaluation on the parent and teacher CBCL and the parent ASQ:SE.

Table 10

Criterion Measures Cut Score, Frequency and Percentage

	CBCL Teacher Risk		CBCL Parent Risk		ASQ:SE Parent	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
TD	80	92.00	61	93.80	111	90.20
FE	7	8.00	4	6.20	12	9.80
Total	87	100.00	65	100.00	123	100.00

Note: TD = Typically Developing; FE = Further Evaluation.

Table 11 reports the percentage of agreement between the criterion measures (parent and teacher CBCL and parent ASQ:SE) and the proposed cut score of 44.5 on the CBRS. Percent totals along the bottom and side correspond to each measure's cut score.

Table 11

Crosstabulation TRF, CBC, ASQ:SE with CBRS at 44.5

Teacher CBCL (TRF) Crosstabulation with Teacher Cut Score of 44.5				
		% TD	% FE	% Total
Teacher CBCL (TRF)	% TD	77.00	14.90	92.00
	% FE	1.00	6.90	8.00
	% Total	78.20	21.80	100.00
Parent CBCL (CBC) Crosstabulation with Teacher Cut Score of 44.5				
		% TD	% FE	% Total
Parent CBCL (CBC)	% TD	81.50	12.30	93.80
	% FE	3.10	3.10	6.20
	% Total	84.60	15.40	100.00
ASQ:SE Crosstabulation with Teacher Cut Score of 44.5				
		% TD	% FE	% Total
ASQ:SE	% TD	76.95	13.25	90.20
	% FE	4.65	5.15	9.80
	% Total	81.60	18.40	100.00

Note: TD = Typically Developing; FE = Further Evaluation.

Research Question Three – Teacher Predictions/CBRS Cut Scores

Kindergarten teacher's predictions of student academic and behavioral readiness align to the proposed CBRS cut score (44.5) with ROC analysis. At the 44.5 cut score the sensitivity and specificity are reported in Table 12.

Table 12

AUC Teacher Predictions and CBRS Cut Score 44.5

Measure	AUC	*SE*	*p*	95% CI	Sensitivity	Specificity
T-CBRS spring/ TBP of Risk	0.90	0.02*	< .001	0.86, 0.95	0.91	0.84
T-CBRS spring/ TAP of Risk	0.84	0.03*	< .001	0.78, 0.88	0.88	0.52

Note. TBP = teacher behavioral prediction; TAP = teacher academic prediction; *nonparametric assumption.

Figure 2 displays the ROC analysis with teachers' prediction of students' behavior and CBRS total score. The graph AUC at 0.90 visually represents all possible teacher CBRS cut point between teacher behavioral prediction and CBRS total score. One cut score was selected at 44.5, where sensitivity and specificity were maximized at .91 and .84 respectively.

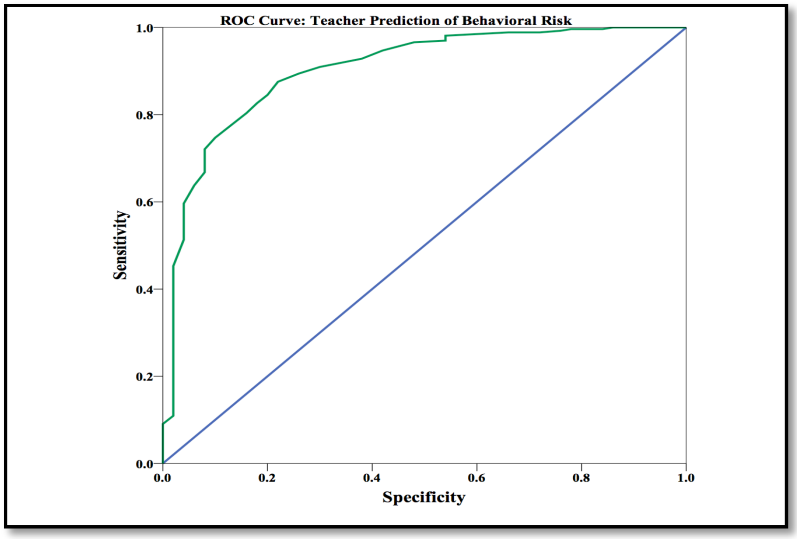


Figure 2. ROC analysis with spring teacher CBRS cut score (44.5) and teacher behavioral predictions.

Figure 3 graphs the ROC analysis with teachers' prediction of students' academics and CBRS total score. The graph AUC at 0.84 visually represents all possible teacher CBRS cut point between teacher academic prediction and CBRS total score. One cut score was selected at 44.5, where sensitivity and specificity were maximized at .88 and .52 respectively.

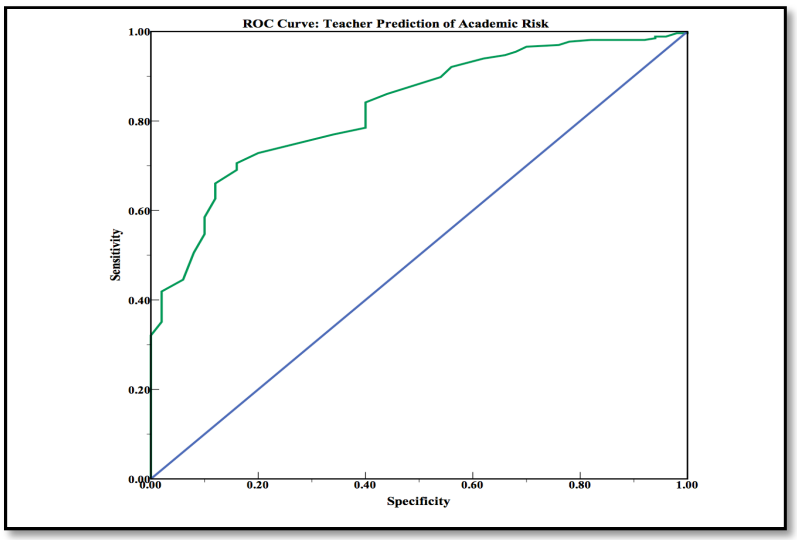


Figure 3. ROC analysis with spring teacher CBRS cut score (44.5) and teacher academic predictions.

Research Question Four –CBRS Predicting easyCBM Risk

Research Question Four investigated how well the CBRS predicted academic risk in the fall and spring, as measured by easyCBM. The easyCBM risk categories of *Some* or *High* risk were collapsed prior to analysis. ROC analyses were conducted with teacher CBRS scores predicting whether students were classified as at-risk for future low academic achievement by easyCBM. Table 13 reports Area Under the Curve (AUC) statistics. An area of 1 represents a perfect test; an area of .5 represents random chance.

Table 13

Area Under the Curve 2013-2014 Fall Teacher CBRS Total Score/ easyCBM (some and high) Risk Designation

easyCBM Measure	Area Under the Curve	Std. Error[a]	Asymptotic Sig.[b]	Confidence Interval Lower	Upper
Fall Reading (Some&High)	0.65	0.03	0	0.58	0.71
Fall Math (Some&High)	0.68	0.04	0	0.06	0.76
Spring Reading (Some&High)	0.69	0.05	0	0.60	0.79
Spring Math (Some&High)	0.71	0.04	0	0.63	0.78

[a] Under The nonparametric assumption. [b] Null hypothesis: true area = 0.5

Research Question Five – CBRS Gain Score Fall To Spring

Question Five analyzed change over time for kindergarten student's behavioral ratings on the CBRS from fall to spring. Comparing CBRS cut score fall to spring by teachers and then parents. Figure 4 displays the mean difference (.69) between teachers' fall and spring results on the CBRS.

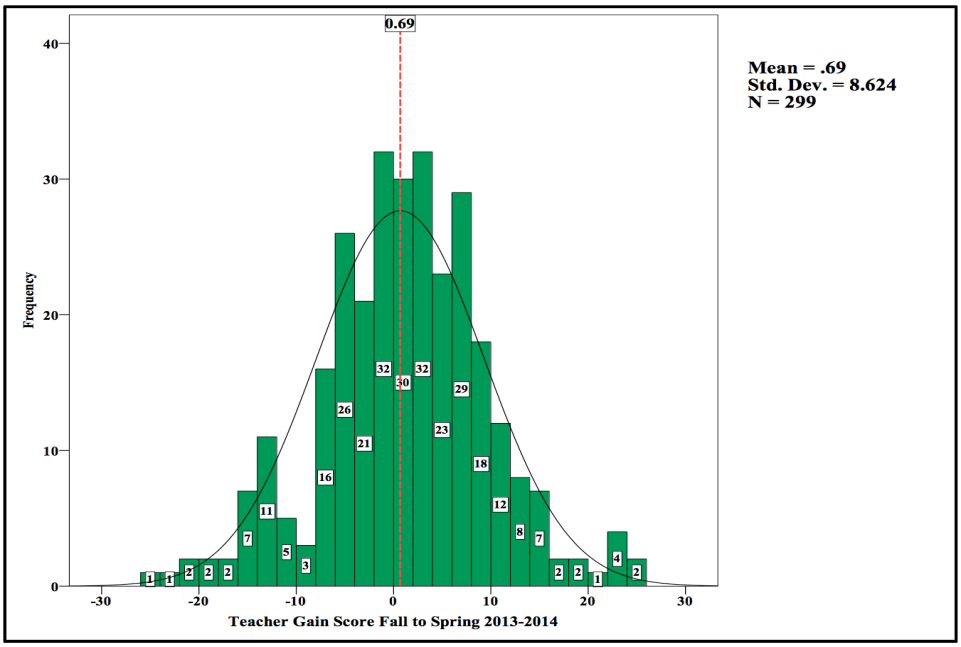


Figure 4. Histogram of Teacher fall to spring CBRS gain score distribution.

Table 14 describes the results of the gain score comparison between teachers CBRS fall and spring. I found non-significant differences (p = .17) on the gain score comparison between teacher's CBRS fall and spring mean scores.

Table 14

Gain Score Teacher Fall and Spring CBRS

Pair	*Mean Diff*	*Std. dev.*	*t*	*df*	Sig. (2-Tailed)	*Std. Error*	95% CI Lower	95% CI Upper
T-CBRS Fall/Spring	.69	8.62	1.38	298	.17	.49	-1.67	.29

Figure 5 displays teacher CBRS gain score frequencies for students within each possible behavioral risk classification pattern (i.e., not at risk in the fall and not at risk in the spring, not at risk in the fall and at risk in the spring, etc.). Note that distribution for students within a stable pattern tended to peak around zero gain, while students in the 0-

to-1 pattern (M = -11.28, SD = 6.87) tended to have negative gains, and students in the 1 to 0 pattern had positive gains (M = 12.36, SD = 6.88).

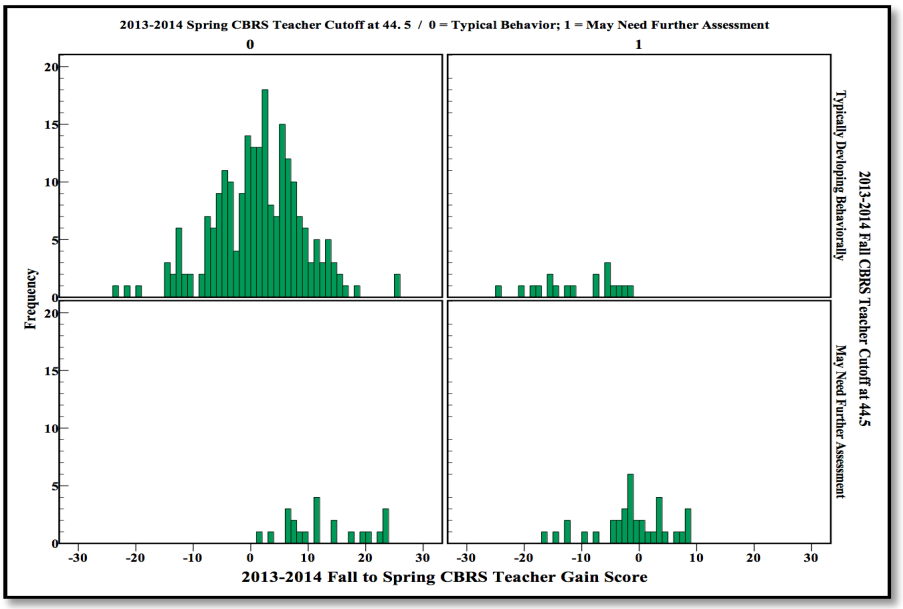


Figure 5. Teacher CBRS distributions for fall to spring patterns of behavioral risk.

Table 15 describes the gain score between teacher fall and spring at the cut score of 44.5. The total number of students in each category, minimum and maximum gain (delta) change; mean gain in scores and the standard deviation are reported.

Table 15

Descriptive Statistics for Gain Scores by Fall and Spring Cut Scores of 44.5

Teacher Fall Cut Score	Teacher Spring Cut Score	*n*	Min	Max	*M*	*SD*
0	0	224	-24	25	0.88	7.69
	1	18	-25	-2	-11.28	6.87
1	0	22	1	23	12.36	6.88
	1	35	-17	8	-1.74	6.37

Note. 0 = Teacher rating *above* fall/spring cut score of 44.5; 1 = Teacher rating *below* fall/spring cut score of 44.5.

Table 16 displays the distribution of teacher CBRS risk fall and spring at a 44.5 cut score. Movement between the dichotomous risk classifications (0 or 1) fall to spring is detailed.

Table 16

Teacher CBRS Cut Score Fall and Spring Distribution

Fall Cut 44.5	Spring Cut 44.5		*n*	Range	Min	Max	*M*	*SE*	*SD*	*Var*
	0	Spring	10	27	45	72	58.70	3.02	9.53	90.90
	1	Spring	6	14	30	44	39.33	2.35	5.75	33.07
0	.	Fall	53	30	45	75	61.40	1.19	8.66	74.94
	0	Fall	224	30	45	75	58.25	.50	7.54	56.89
	0	Spring	224	30	45	75	59.13	.53	7.94	63.00
	1	Fall	18	19	45	64	51.72	1.39	5.91	34.92
	1	Spring	18	15	29	44	40.44	.93	3.93	15.44
1	.	Fall	27	29	15	44	35.33	1.58	8.21	67.39
	0	Fall	22	9	35	44	40.50	.55	2.60	6.74
	0	Spring	22	18	45	63	52.86	1.18	5.54	30.70
	1	Fall	35	19	25	44	38.03	.75	4.43	19.62
	1	Spring	35	29	15	44	36.29	1.20	7.09	50.33

Note. 0 = Typically developing behaviorally; 1 = In need of further evaluation.

Figure 6 displays the mean difference between parent's fall and spring results on the CBRS. A mean difference fall to spring of 1.66 and a standard deviation of 8.34 is displayed.

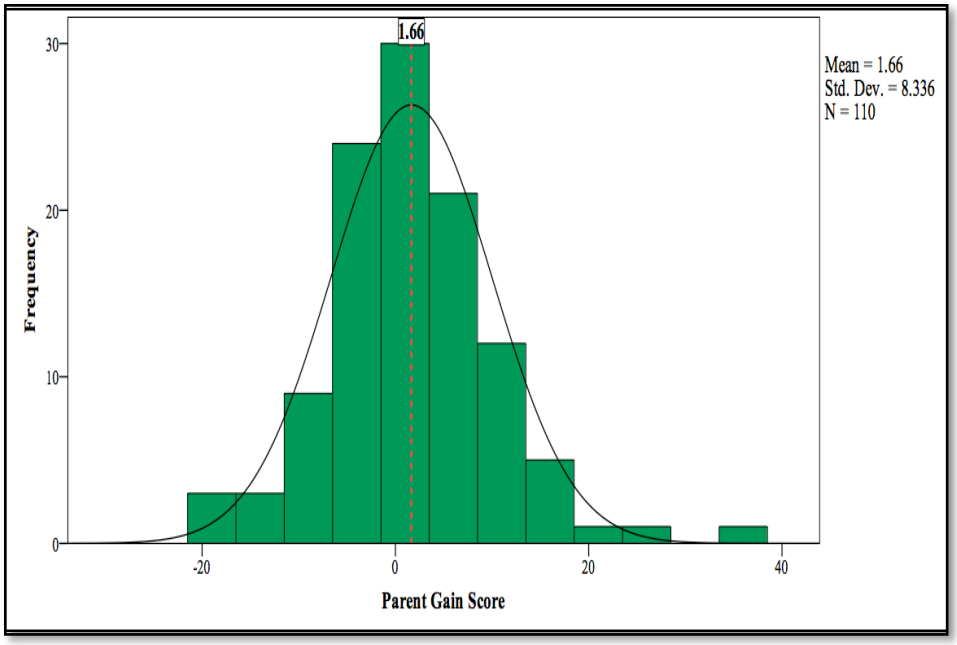


Figure 6. Histogram of Parent fall to spring CBRS gain score distribution.

Table 17 describes the results of the gain score comparison between parents CBRS fall and spring. I found significant differences (p = .04) on the gain score comparison between parent's CBRS fall and spring mean scores.

Table 17

Gain Score Parent Fall and Spring CBRS

Pair	*Mean Diff*	*Std. dev.*	*t*	*df*	Sig. (2-Tailed)	*Std. Error*	95% CI Lower	95% CI Upper
P-CBRS Fall/Spring	1.66	8.34	2.09	109	.04	.79	-3.24	-.09

Figure 7 displays parent CBRS gain score frequencies for students within each possible behavioral risk classification pattern (i.e., not at risk in the fall and not at risk in the spring, not at risk in the fall and at risk in the spring, etc.). Note that distribution for students within a stable pattern tended to peak around zero gain, while students in the 0-to-0 1 pattern (M = -11.00, SD = 8.54) tended to have negative gains, and students in the 1 to 0 pattern had positive gains (M = 17.40, SD = 11.62).

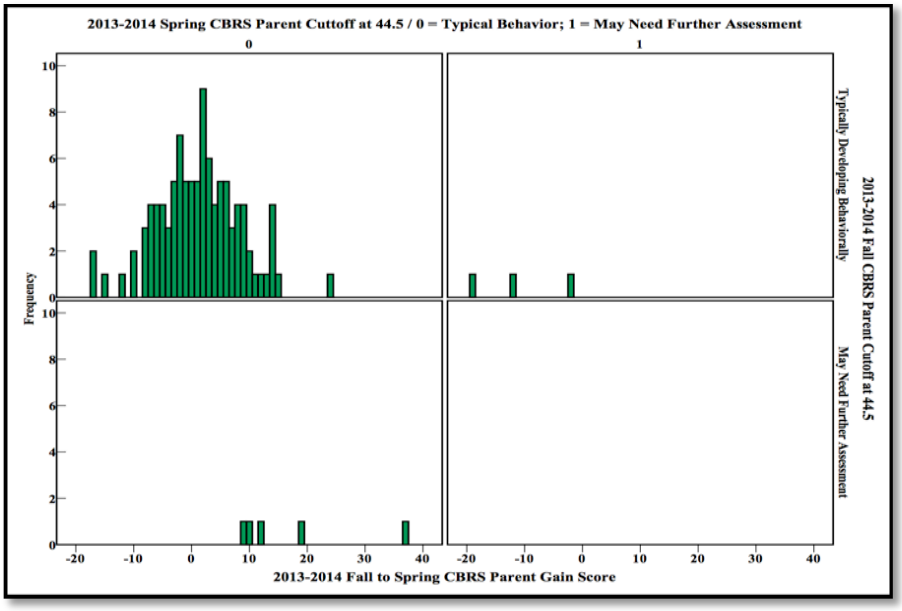


Figure 7. Parent CBRS distributions for fall to spring patterns of behavioral risk.

Table 18 describes the gain score between parent fall and spring at the cut score of 44.5. The total number of students in each category, minimum and maximum gain (delta) change; mean gain in scores and the standard deviation are reported.

Table 18

Descriptive Statistics for Gain Scores by Fall and Spring Cut Scores of 44.5

Parent Fall Cut Score	Parent Spring Cut Score	*n*	Min	Max	*M*	*SD*
0	0	102	-17	24	1.26	7.14
	1	3	-19	-2	-11.00	8.54
1	0	5	9	37	17.40	11.63
	1	0	.	.	.	.

Note. 0 = Parent rating *above* fall/spring cut score of 44.5; 1 = Parent rating *below* fall/spring cut score of 44.5.

Table 19 describes the distribution of teacher CBRS risk fall and spring at a 44.5 cut score. Movement between the dichotomous risk classifications (0 = Typically

developing and 1 = Indicates student may be in need of further behavioral evaluation) fall to spring is detailed.

Table 19

Parent CBRS Fall and Spring Cut Score Distribution

Fall Cut 44.5	Spring Cut 44.5		*n*	Range	Min	Max	*M*	*SE*	*SD*	*Var*
	0	Spring	37	25	49	74	60.68	1.07	6.51	42.34
	1	Spring	1	0	44	44	44.00	.	.	.
0	.	Fall	171	30	45	75	58.63	.51	6.60	43.53
	0	Fall	102	27	45	72	59.49	.62	6.28	39.38
	0	Spring	102	28	45	73	60.75	.63	6.36	40.48
	1	Fall	3	17	46	63	55.00	4.93	8.54	73.00
	1	Spring	3	0	44	44	44.00	.00	.00	.00
1	.	Fall	9	9	35	44	40.11	1.16	3.48	12.11
	0	Fall	5	8	36	44	40.00	1.52	3.39	11.50
	0	Spring	5	27	48	75	57.40	4.61	10.31	106.30

Note. 0 = Typically developing behaviorally; 1 = In need of further evaluation.

CHAPTER IV

DISCUSSION AND CONCLUSION

This section includes a review and interpretation of the results and a discussion of the study limitations. Further analysis of the findings and future research recommendations are made, followed by the study conclusion.

Summary of Findings

The CBRS has strong internal consistency recording Cronbach's α of .95 to .97 for teachers and .89 to .97 for parents as respondents. ROC analysis between other criterion measures (CBCL, ASQ:SE and teacher predictions) reported AUC between .74 to .90 for teachers and .84 to .92 for parents. These results appear consistent with previously reported psychometrics for the CBRS as described by Bronson et al. (1995).

The total Oregon kindergarten sample 2013-2014 matches up with a 44.5 point cut score representing 20% of the population. MY research recommends a cut score on the CBRS at 44.5 when selecting an appropriate cut score to separate the CBRS into two dichotomous categories. Students in need of further behavioral evaluation (below the 44.5 cut score on the CBRS) should be administered the ASQ:SE with parents as respondents. The additional information collected from the ASQ:SE will help ensure that we are allocating additional information on students who are correctly identified as in need of behavioral supports. Resources are limited in schools today and the combination of CBRS and ASQ:SE will help prioritize the appropriate students for further behavioral resources.

The CBRS predicted point-in-time academic risk (easyCBM academic measures) little better than chance (AUC ranging from .65 to .71). Of note from earlier research on

the CBRS, Bronson (1995) found "the spring CBRS was related only to the proportion of math or language activities observed in the classroom (r =.39, p <.01)" (p. 272). Bronson is the primary researcher credited with the creation of the CBRS. AUC for the spring math risk results are similar in this research, and spring math results were the only academic risk the CBRS was able to significantly predict (AUC = .71).

The results of the CBRS change over time showed very little movement in the mean score between both teachers (mean difference = .69) and parents (mean difference = 1.66). Initial analysis indicated that behavior was stable over the course of the kindergarten year. Without further analysis this result could be used to confirm the limited amount of variability over time or the stability of behavior. However, the difference in mean scores over time (fall to spring) may fail to take into account some of the variability in scores. Crosstab analysis indicates some movement from above and below the cut score over the course of the kindergarten year.

Teacher predictions of academic risk and the associated CBRS cut score (44.5) along with teacher predictions of behaviorally typically developing students from students in need of further evaluation indicate a strong predictive relationship. ROC analysis of teacher prediction is very high with AUC of .90 and .83 respectively. Teachers had the advantage of administering both KA academic measures and easyCBM fall benchmarking measures (along with other academic screenings) before predicting spring (end of year) academic and behavioral performance. However, results indicate that teacher's may have the ability to accurately predict end of year academic and behavioral performance after the first four to six weeks of a school year.

Parents as Respondents

My study investigated the validity of parents as respondents on the CBRS at kindergarten entry and across the school year (fall to spring). Research has shown parent reports can predict their child's developmental problems (Tervo, 2005) and mental health problems (Glascoe, 2003). My research study indicated parents' responses on the CBRS have a strong AUC with both the CBCL (.84) and the ASQ:SE (.92).

The internal consistency (Cronbach's α) of the CBRS across parent and teacher respondents and testing occasions demonstrated internal consistency that was quite high, averaging .90 for parents to .97 average for teachers for the CBRS sample in my study. Parents have been the primary respondents on behavioral screening tools from birth to kindergarten entry. Other than behavioral observations and some potential preschool teacher behavioral screening tools, parents have been the primary respondents on behavioral screening measures for pediatricians, psychologists, psychiatrists, and other mental health providers. Kindergarten marks the first occasion where most young children have their behavior rated by individuals other than their parents. These findings reaffirm the claim that parents are able to complete developmental questionnaires with reasonable consistency (Squires et al., 2001; Squires, Potter, Bricker, & Lamorey, 1998).

With the use of Google Forms, the CBRS is easily integrated into the registration process for all parents of kindergarten students. Both English and Spanish (see Appendix F) were included on the same Google Form and data were collected on the amount of time required for parents to complete the CBRS. Parents who primarily speak English completed the CBRS in approximately five minutes and parents who primarily speak

Spanish completed the CBRS in approximately six minutes. Five to six minutes is not much individual parent time for information on students that is so potentially valuable for teachers and the district.

Parents have known their children for five years before responding to the CBRS, while teachers are just getting to know these students during the first four to six weeks of school. Parents fill out the rating scale for their individual child, while teachers fill out multiple (sometimes up to 45+ students) forms for a classroom. Asking parents to participate in the behavioral rating scale process validates parents as the child's first teacher and institutes parents as the experts on their own child's behavior. A secondary benefit of parent participation on the CBRS is the conceptual understanding of the types of behaviors deemed important and the way schools measure appropriate behaviors. Once parents know that schools are looking at their child's ability to self-regulate and be socially-emotionally appropriate, parents can help partner with schools to support development of these behavioral skills. My study echoes the research of Squires et al. (2001), which validated parents as respondents to behavioral screeners (e.g., CBRS), demonstrating that involving parents in this way provided many advantages, including cost and time saving effectiveness, parents feeling included as team members, and improving accuracy of information gathering. Parent's inputs should be considered to both validate and incorporate them with schools and teachers during this critical transition to kindergarten. Open communication (school to home and vise-versa) and transparent practices should prevail while establishing new relationships in kindergarten.

The KA should not be secret, secured, or otherwise off-limits to the public. The KA is the ABCs and the 123s, along with a screener of appropriate behavior. The KA is

worth publicizing, sharing, and targeting for pre-school instruction. Schools can use support in making the KA content, as public as possible and one way to do this is to include parents as respondents on the CBRS.

Parents, like all respondents, have a certain amount of bias and some biases may be evident when parents are assessing their own child's behavior. In this study, parents consistently had higher mean scores at all three administrations of the CBRS by a difference of 4.14, 5.47, and 5.68 point, fall, spring, and fall respectively. Also, parents consistently had lower standard deviation results by a difference of 3.85, 4.20, and 2.44 point, fall, spring, and fall respectively. Constantly lower standard deviation (than teacher's results) may indicate that parents view less between-student variability in behaviors than teachers do. Several types of bias exist and while all types cannot be eliminated, consideration of bias in reporting for both parents and teachers is important.

Better than average bias, halo effects, unskilled/unaware, bias blind spot and other types of bias were discussed previously (Pronin & Kugler, 2007; Williams & Gilovich, 2012). No group of respondents is free of bias and as reasonable bias exists, each group of respondents (parents and teachers) should be prepared to consider the behavior or introspection necessary to apply the same possibility of bias believed to exits in others to themselves. The closer we are to another person the more we associate flattering characteristics of that person as their true nature. Parents may look at their offspring more as *works in progress* than they do for other people. Parents and teachers as respondents may look at behavior from different perspectives based on a number of factors, including: environment, sample size, comparison group, experience, socio-economic background, education, and culture.

While no single study can establish the use of parents as respondents on the CBRS as a valid and reliable source of information, my study does provide evidence for the validity of parents as respondents. Especially important to note is the ability of parents to persevere and provide useful information as the length and depth of the behavioral assessments increase. The CBCL is composed of more than 115 items and parent's individual student ratings provided insightful, while teachers were stretched to respond meaningfully to detailed items, on the multiple students they were just getting to know at kindergarten entry.

Even if school districts across Oregon choose not to solicit parents as respondents on the CBRS, the use of parents as respondents will continue to be important, especially if students are in need of further evaluation based on initial behavioral screening. This research suggests that, for students who scored below 44.5 points on the CBRS, schools may need to seek parents' help to further evaluate students' behaviors. This multi-gated approach (Feil & Becker, 1993; Simonsen & Bullis, 2007) to behavioral screening will increase the true positive identification rate and decrease the false positive/false negative rate, thereby helping to conserve limited resources that could be utilized for potential behavioral interventions.

Cut Scores in Behavioral Ratings

The identification of a cut score on the CBRS was a critical component of this research. The dichotomous sorting of students into two categories: those who appear to be typically developing behaviorally and those who appear to be in need of further behavioral evaluation, the location of the cut score (44.5), is the primary contribution of this research. Yovanoff and Squires (2006) research determined a cutoff score for the

ASQ:SE and served as a credible model for this research and research endeavoring to establish a cut-score on a behavioral rating scale. A cut score on the total CBRS score of 44.5 is proposed as the most defensible score where sensitivity and specificity were maximized across the greatest number of criterion measures. The 44.5 cutoff score aligns with other system wide approaches (e.g. RTI and PBIS) to screen for academic and behavioral supports, consistently identifying near 20% of the sample population as in need of further assessment.

ODE reports results from the ATLA portion of the kindergarten assessment to schools as averages (1-5 Likert scale) on the two behavioral domains (Self-Regulation and Interpersonal Skills). Analyzing the Likert scale (CBRS) for an appropriate way (face validity) to divide the scale into typically developing or in need of further behavioral assessment, the corresponding scale definitions (2 = The child *rarely* exhibits the behavior described by the item and 3 = The child *sometimes* exhibits the behavior described by the item) delineate a logical cut point. The differences between students who *rarely* and *sometimes* exhibit expected behaviors (on average) serves to substantiate the proposed cut score on the CBRS. By multiplying the number of items (15) by the minimum of developmentally appropriate response (3 = *sometimes* exhibits the behavior) 45 points are required to average expected behavior *sometimes*. This suggests CBRS results should indicate that students who *rarely* (on average according to the Likert scale score) display expected behaviors are in need of further behavioral evaluation (≤ 44.5)

Relation Among Measures (Criterion-referenced Validity)

While the CBRS has strong relation to other measures of behavior, CBCL, ASQ:SE and teacher predictions, the same strong relationship may not exit (for the research district sample) with measures of academic performance, such as easyCBM (some and high risk) early literacy and numeracy. The link between problem behavior and academic risk has been previously established (Nelson et al., 2003) and the reciprocal nature of learning behaviors and academic achievement is well researched (McClelland et al., 2006; McClelland et al., 2007; McClelland et al., 2000). Most of the CBRS predictive findings of academic performance were little better than chance predictions with AUC ranging from .65 some and high reading risk in the fall to .71 some and high math risk in the spring. However, just as Bronson (1995) was able to show, a connection between the CBRS and spring math performance ($r = .39$, $p < .01$) existed and similar results were found between 2013-fall teacher CBRS scores and 2014-spring easyCBM (some and high) math risk.

Teisl et al. (2001) found kindergarten teachers' ratings of future academic performance were significantly correlated with scores on outcome measures. Teachers' ability to predict kindergarten students' behavioral and academic risk in this study showed a strong relationship between the teacher fall behavior predictions and teacher spring CBRS cut score (AUC = .91) and academic risk (AUC = .84). Teachers were asked if students would be behaving typically or in need of further assessment by third grade and if the student would be reading at grade level by third grade or below grade level. Teachers' predictions were analyzed relative to the total spring behavioral (CBRS) cut score (44.5) and easyCBM reading risk (some and high) and results indicate a strong

predictive relationship. As with any respondent, bias exists, and confirmatory biases may play a significant role in teachers' predictive results.

Study Limitations

To start, as a source of subjectivity, it is difficult to determine the accuracy of a numerical value based on a limited scale to a continuum of behaviors. Determining whether a point (cutoff) exists at which these numerical values of behavior can be dichotomously sorted, also presents significant and unique limitations to studies of behavior. Base rate issues present the most substantial limitation of this study. The purpose of the criterion measures selected to determine an appropriate cut score on the CBRS were to determine students with significant, clinical behavioral issues. Accordingly, few students were classified in the clinical range. This led to the ROC curve having *jumps* in sensitivity (e.g., from .25 to .50), and the *optimal* cut-point may be specific to the study sample.

Even though the CBRS has been sorted into constructs of self-regulation and social-emotional behavior, this research only looked to the total CBRS score for classification proposes. Fifteen questions made up the CBRS; 10 of the questions were identified to measure self-regulatory behaviors and five questions were reported as measuring social-emotional behavior. Averages for the total CBRS score and averages for each of these identified behavioral constructs were reported to districts by Oregon Department of Education (2015b). My research proposed a cut score that would require individual student's total CBRS score, a number that Oregon school districts typically do not calculate when they report back to ODE on individual item scores for each student.

My study used parents as respondents to the CBRS and these results, while of interest to the research and the research district; any claims of these parent results may not generalize across all Oregon schools. Teachers as respondents served as the primary source of data in determining an appropriate cut score for the CBRS, in keeping with ODE's current KA administration practice.

Teachers were asked if students would be behaving typically or in need of further assessment by third grade and if the student would be reading at grade level by third grade or reading below grade level. While the intended purpose was to ask kindergarten teachers to predict future academics and behavior (from the beginning of the kindergarten year) my study only measured predictions out to the end of the kindergarten year.

While every effort was made to stratify samples from the research district population, a guarantee that some chance portions of sub-populations were not excluded from the sampling process cannot be made. Title I and non-Title I schools were always selected for comparison, as well as the inclusion of the district special education and English language learner populations. Elementary schools in the district's more rural settings with smaller overall populations ($n < 250$) and those schools from in-town schools ($n > 500$) were controlled for.

Future Research

The results of my study suggest a proposed cut score for the total CBRS score of 44.5 to separate the rating scale into two categories of typically developing, and in need of further evaluation. Future research should be conducted to replicate this study and confirm the appropriateness of this cut score or suggest an alternative cut score. Many factors, beyond the scope of any single research study, need to be considered when

making classification decisions that obligate educational resources. While a 20% of the total sample population decision rule may work for RTI and PBIS processes (80% typically developing and 20% need additional interventions) and seems appropriate for this purpose, what constitutes *further behavioral assessment* and the resources this decision requires of schools needs further investigation. Evidence of the suggested cut score of 44.5 aligns nicely at 20% of Oregon's kindergarten population.

Furthermore, research that drills down into the two constructs of the CBRS and provides a weighted score for self-regulatory and social-emotional behavior may be needed. Future research may need to take the effects of these two behavioral components into consideration and, perhaps, suggest separate cut scores for self-regulatory and social-emotional behaviors. Drilling into the CBRS and separating behavioral constructs may point to the need for more targeted behavioral skill building for students who need additional supports. Parents as respondents on the CBRS could advantage Oregon schools behavioral screening efforts. Regardless, additional research to further investigate appropriate CBRS cutoff scores will be important to ensure results are sensitive to any classification decision making.

The pilot study (2012-2013) conducted on the Oregon KA and results analyzed by Tindal et al. (April 2013) included two questions relating to students expression of hostility, both physically and verbally, towards others. Because these items were reverse coded (higher Likert score indicated more risk) and did not factor the same as the other 15 items in the CBRS pilot, the hostility questions were eliminated from Oregon's KA. My research included these two additional questions about physical and verbal hostility toward other (see Appendix F, CBRS Google Forms; questions 16 & 17). Both parents

and teachers responded to these hostility questions during the fall 2013, spring 2014, and fall 2014 CBRS administrations. Initial analysis indicated strong predictive nature of these previously eliminated hostility questions for behavioral risk. While initial results can only be considered within a face validity perspective, further research on the pilot sample item level data and results collected in this study and potentially others, warrant further consideration.

Of particular interest from a practitioner standpoint is the ease of administration of the Oregon KA. The number of times the CBRS portion of the kindergarten assessment changed hands from ordering, distribution, administration, scoring, and reporting introduced unnecessary error at each transition. The paper and pencil administration of a large-scale assessment of this scope seems dubious in our modern technological world. The use of Google Forms to collect the CBRS from parents in this study eliminated the need to transpose results into a separate spreadsheet and allowed forms to be set up to reduce the opportunity for respondents to (inappropriately) select scores between (pencil marking responses as 3.5 as apposed to a 3 or 4) approved Likert scaled responses. Future research is suggested to include the use of electronic scoring, reporting, and uploading to ease practitioner use of the CBRS. Perhaps the easyCBM system could be utilized for all three components of Oregon's KA to include electronic access for all Oregon's kindergarten students. The administration, scoring, and reporting of early literacy, early numeracy, and the CBRS could be done though one electronic platform (see Appendix F; CBRS Goggle Forms) and without the need for excessive paper/pencil resources, unwarranted error, and undue labor issues.

On a final note for future research implications, the increase of third grade reading and math results seems like the logical target (stated by ODE) for improving kindergarten academic measures. What will the target be for improving self-regulatory and social-emotional behaviors? Is Oregon looking to decrease third grade office discipline referral rates or reduce the number of prison beds needed in Oregon as a result of improving these behavioral indicators? Further research is needed to provide guidance (targets) to Oregon schools and community on how to strategically move the behavioral outcomes, along with adequate resources and supports for the appropriate intervention to do so.

Conclusion

Oregon's inclusion of a behavioral component (CBRS) on the kindergarten assessment is encouraging, yet some caution must be noted when describing the ATLA portion of Oregon's KA. The ATLA should not be referred to as a behavioral/developmental assessment. Behavioral evaluations (or assessments) are a more involved process administered by a trained professional, aimed at identifying specific behavioral disorders that are affecting a student. The ATLA (CBRS) component of Oregon's KA is more appropriately described as a behavioral screening, with a brief administration in a standardized and validated manner, for identification of students at risk for behavioral delays. The CBRS cannot result in a diagnosis or specific course of treatment, but can identify a student in need of further evaluation. Without the use of such standardized, validated screening tools, Oregon will not reliably identify children at risk for behavioral related delays.

Research has established a strong connection between students' ability to self-regulate (task behavior) and future academic success. As kindergarten continues to

increase not only in length of day but also in academic rigor, it is imperative that developmentally appropriate practices originate and build from a base of self-regulation and social-emotional skill. The fact that Oregon prioritized measures of social-emotional and self-regulatory behavior is a good start. Selecting an appropriate behavioral screening tool that is both easy to administer and provides useful decision-making is important. The public appetite and climate around screening/assessment needs to be carefully navigated. Much traction around behavior and appropriate developmental practice can be gained if the selected behavioral screening tool proves useful for furthering this work. As long as practitioners and the public struggle to make sense of behavioral screening results and debate future direction to effect behavioral change, behavioral screening on the kindergarten assessment may be categorized as lacking utility. This research recommends a cut score on the CBRS to help provide decision making utility to this behavioral screening/rating scale.

Finally, it is important to look at the ATLA (CBRS) component of the Oregon KA as one indicator or initial screener of behavior in the larger school context. Screening tools or rating scales have minimal functionality if they have no associated sorting characteristics. Average CBRS score results alone are too imprecise, even for a simple dichotomous sorting. This research proposed a cut score on the CBRS, as administered during the Oregon KA, at the 44.5-point mark, to sort students into two categories. Students who score 45 or more points on the CBRS may be considered *typically developing behaviorally* and students who score 44 or fewer points on the CBRS may be considered *in need of further behavioral assessment*. Professional decision-making should never be an all or nothing proposition and students scoring close to the proposed

cut score should be given flexible consideration in this decision making process, based on professional opinion and in partnership with parents. For students selected for further behavioral assessment by the CBRS, schools should consider the use of parent responses on the ASQ:SE as the next step in a multi-gated approach to behavioral screening.

Many Oregon schools, including the school district in my study, use a RTI and PBIS process for screening and identifying students at risk academically and behaviorally. RTI processes are used in an effort to provide immediate, appropriate, interventions and supports for student learning. The use of screening and progress monitoring tools like the easyCBM system have a well-established research base and provide schools with the tools they need for academic decision-making. Interventions are monitored and adjusted as necessary to ensure that students are responding/learning appropriately. If a student fails to respond to interventions, a process is in place to individualize and intensify interventions to better support the student. Schools should consider the self-regulatory and social-emotional development of kindergarten students in the overall context, much like we do with strategies for enhancing intellectual and academic development for all students. The use of the CBRS as an initial screening tool might prove useful as schools build behavioral support systems. The application of an RTI screening model to academic (e.g., easyCBM literacy and numeracy) concerns has been studied more extensively than PBIS applications to self-regulatory and social-emotional behavioral development. Ultimately, however, these academic and behavioral approaches need to be amalgamated and cogitated as one inclusive, interrelated model, addressing all aspects for the optimal growth of students.

APPENDIX A

OREGON KINDERGARTEN ASSESSMENT: APPROACHES TO LEARNING:

CHILD BEHAVIORAL RATING SCALE (CBRS)

Each item is rated on a 1-5 Likert scale

First ten items are associated with "task behavior" or "self-regulation."

1. Observes rules and follows directions without requiring repeated reminders.
2. Completes learning tasks involving two or more steps (e.g., cutting and pasting) in organized way.
3. Completes tasks successfully.
4. Attempts new challenging tasks.
5. Concentrates when working on a task; is not easily distracted by surrounding activities.
6. Responds to instructions and then begins an appropriate task without being reminded.
7. Takes time to do his/her best on a task.
8. Finds and organizes materials and works in an appropriate place when activities are initiated.
9. Sees own errors in a task and corrects them.
10. Returns to unfinished tasks after interruption.

Next five items are associated with "social-emotional behavior."

11. Willing to share toys or other things with other children when playing; does not fight or argue with playmates in disputes over property.
12. Cooperative with playmates when participating in a group play activity; willing to give and take in the group, to listen to or help others.
13. Takes turns in a game situation with toys, materials, and other things without being told to do so.
14. Complies with adult directives, giving little or no verbal or physical resistance, even with tasks that he/she dislikes.
15. Does not fuss when he/she has to wait briefly to get attention from teacher or other adult; child may be asked once to wait by the teacher or adult.

APPENDIX B

ITEMS DEFINING THE SCHOOL-AGE CROSS-INFORMANT SYNDROME CONSTRUCTS,

PLUS ITEMS SPECIFIC TO THE CBCL/6-18 AND TRF SYNDROME SCALES[a]

Anxious Depressed	Withdrawn Depressed	Somatic Complaints	Social Problems	Thought Problems	Attention Problems
14. Cries a lot	5. Enjoys little	47. Nightmares[c]	11.Too dependent	9. Can't get mind off thoug	1. Acts young
29. Fears	42. Rather be alone	51. Feels dizzy	12. Lonely	18. Harms self	4. Fails to finish
30. Fears school	65. Refuses to talk	54. Overtired	25. Doesn't get along	40. Hears thins	8. Can't concentrate
31. Fears doing bad	69. Secretive	56a. Aches, pains	27. Jealous	46. Twitching	10. Can't sit still
32. Must be perfect	75. Shy, timid	56b. Headaches	34. Others out to get him/h	58. Picks skin	13. Confused
33. Feels unloved	102. Lacks energy	56c Nausea	36. Accident-prone	66. Repeats acts	17. Daydreams
35. Feels worthless	103. Sad	56d. Eye problems	38. Gets teased	70. Sees things	41. Impulsive
45. Nervous, tense	111. Withdrawn	56e. Skin problems	48. Not liked	76. Sleeps less[c]	61. Poor schoolwork
50. Fearful, anxious	**Rule Breaking Behavior**	56f. Stomachaches	62. Clumsy	83. Stores things	78. Inattentive
52. Feels too guilty	2. Drinks alcohol[c]	56g. Vomiting	64. Prefers younger kids	84. Strange behavior	80. Stares blankly[d]
71. Self-conscious	26. Lacks guilt	**Specific to CBCL**	79. Speech problems	85. Strange ideas	**Specific to TRF**
91. Talks or thinks of suici	28. Breaks rules	49. Constipated[c,d]		100. Trouble sleeping[c]	2. Odd noises[b,d]
112. Worries	39. Bad friends	**Aggressive Behavior**		**Specific to CBCL**	7. Brags
Specific to TRF	43. Lies, cheats	3. Argues a lot	87. Mood changes	59. Sex parts in public[c,d]	15. Fidgets[b,d]
81. Hurt when criticized[b,d]	63. Prefers older kids	16. Mean to others	88. Sulks[d]	60. Sex parts too much[c,d]	22. Difficulty with directions
106. Anxious to please[b,c]	67. Runs away[c]	19. Demands attention	89. Suspicious	92. Sleep talks/walks[c,d]	24. Distrubs others[b,d]
108. Afraid to make mistake	72. Sets Fires[c]	20. Destroys own things	94. Teases a lot		49. Difficulty learning[b,d]
	73. Sex problems[c,d]	21. Destroys others' thir	95. Temper		53. Talks out of turn[b,d]
	81. Steals at home[c]	22. Disobedient at home	97. Threatens others		60. Apathetic[b,d]
	82. Steals outside home	23. Disobedient at schoc	104 Loud		67. Disrupts discipline[b,d]
	90. Swearing	37. Gets in fights	**Specific to TRF**		72. Messy work[b,d]
	96. Thinks of sex too muc	57. Attacks people	6. Defiant[b,d]		73. Irresponsible[b,d]
	99. Uses tobacco	68. Screams a lot	76. Explosive[b,d]		74. Shows off
	101. Truant	86. Stubborn, sullen	77. Easily frustrated[b,d]		92. Underachieving[b,d]
	105. Uses drugs				93. Talks too much
	106. Vandalism[c,d]				100. Fails to carry out tasks[b,d]
	Specific to TRF				109. Whining[d]
	98. Tardy[b,d]				

[a] Items are designated by the numbers they bear on the CBCL/6-18, and TRF and summaries of their content.
[b] Not on CBCL.
[c] Not on TRF.
Note. Adapted from Manual for the ASEBA School-Forms and Profiles, by Achenbach and Rescorla, 2001, p. 8

APPENDIX C

TEST-RETEST RELIABILITIES AND ALPHA COEFFICIENTS

	Scales	CBCL[a]		TRF[a]	
		r	α	*r*	α
		N=73	3,210	44	3,086
Competence & Adaptive	Activities (Academic)[b]	.82[d,e]	.69	.93	NA
	Social (Working)[b]	.93	.68	.93	NA
	School (Behaving)[b]	.90	.63	.83	NA
	Total Comp. (Learning)[b]	.91[d,e]	.79	.90	NA
	(Happy)[b]	NA	NA	.78	NA
	(Total Adaptive)[b]	NA	NA	.93	.90
	Mean *r*[c]	.90	NA	.90	NA
Empirically Based	Anxious/Depressed	.82	.84	.89[d,e]	.86
	Withdrawn/Depressed	.89[d,e]	.80	.60	.81
	Somatic Complaints	.92	.78	.83	.72
	Social Problems	.90	.82	.95	.82
	Thought Problems	.86	.78	.72[d,e]	.72
	Attention Problems	.92	.86	.95	.95
	(Inattention)[b]	NA	NA	.96	.93
	(Hyperactivity-Impulsivity)[b]	NA	NA	.92	.93
	Rule-Breaking Behavior	.91	.85	.82	.95
	Aggressive Behavior	.90	.94	.88	.95
	Internalizing	.91[d]	.90	.86[d,e]	.90
	Externalizing	.92	.94	.89	.95
	Total Problems	.94[d,e]	.97	.95[d,e]	.97
	Mean *r*[c]	.90	NA	.90	NA
DSM-Oriented	Affective Problems	.84	.82	.62	.76
	Anxiety Problems	.80	.72	.73	.73
	Somatic Problems	.90	.75	.73	.80
	ADH Problems	.93	.84	.95	.94
	(Inattention)[b]	NA	NA	.93	.94
	(Hyperactivity-Impulsivity)[b]	NA	NA	.93	.90
	Oppositional Defiant Problems	.85	.86	.91	.90
	Conduct Problems	.93	.91	.71	.90
	Mean *r*[c]	.88	NA	.85	NA

[a] Mean test-retest interval for CBCL = 8 days; for TRF = 16.
[b] Parentheses indicate scales that are only on TRF.
[c] Mean *r* computed by *z* transformation.
[d] Time 1 > Time 2 by *t* test.
[e] When corrected for the number of comparisons, Time 1 vs. Time 2 difference was not significant.
Note. Adapted from Manual for the ASEBA School-Age Forms & Profiles, by Achenbach and Rescorla, 2001, p. 101.

APPENDIX D

CROSS-INFORMANT AGREEMENT ON SCALE SCORES

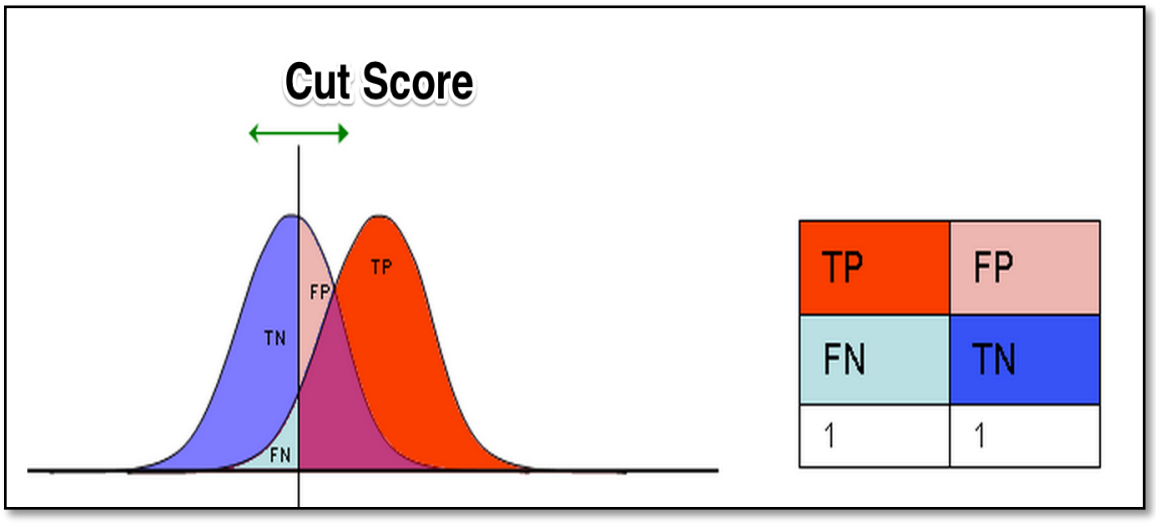
Scales: Parent (CBCL) and Teacher (TRF)	**CBCL[a]**	**TRF[b]**	**CBCL x TRF**
Competence & Adaptive	*N* = 297	88	1,126
Activities (Academic)[c]	.57[e]	.55	NA
Social (Working)[c]	.71	.58	NA
School (Behaving)[c]	.76	.50	NA
Total Comp. (Learning)[c]	.68	.37	NA
(Happy)[c]	NA	.38	NA
(Total Adaptive)[c]	NA	.55	NA
Mean *r*[b]	.69	.49	NA
Empirically Based			
Anxious/Depressed	.68[e]	.59	.19
Withdrawn/Depressed	.69	.57	.24
Somatic Complaints	.65[e]	.28	.15
Social Problems	.77[e,f]	.59	.31
Thought Problems	.75[e,f]	.59	.18
Attention Problems	.73	.61	44
(Inattention)[c]	NA	.565	NA
(Hyperactivity-Impulsivity)[c]	NA	.69	NA
Rule-Braking Behavior	.85	.69	.38
Aggressive Behavior	.82[e]	.69	.33
Internalizing	.72[e]	.58	.21
Externalizing	.85[e]	.69	.36
Total Problems	.80[e]	.55	.35
Mean *r*[b]	.76	.60	.29
DSM-Oriented			
Affective Problems	.69[e]	.55	.23
Anxiety Problems	.66	.48	.23
Somatic Problems	.63[e]	.20	.12
ADHD Problems	.70[e,f]	.65	.42
(Inattention)[c]	NA	.45	NA
(Hyperactivity-Impulsivity)[c]	NA	.72	NA
Oppositional Defiant Problems	.74	.67	.32
Conduct Problems	.88[e]	.76	.39
Mean r[b]	.73	.58	.29
Mean Q correlation is between items	.59	.51	.23

Note. NA = not applicable because the scale is not scored by that combination of raters. All Pearson *r*s were significant at $p < .05$.
[a] CBCL Pearson *r*s between mother and father ratings.
[b] TRF Pearson *r*s between rating by pairs of teachers.
[c] Parentheses indicate scales that are only on TRF.
[d] Mean *r* computed by *z* transformation.
[e] Mothers' ratings > fathers' ratings at $p < .01$.
[f] When corrected for the number of comparisons, difference in mean scores was not significant.
Note. Adapted from Manual for the ASEBA School-Age Forms and Profiles, by Achenbach and Rescorla, 2001, p. 104.

APPENDIX E

ROC ANALYSIS OUTPUT TABLES

		Condition (as determined by "Gold standard")		
		Condition positive	Condition negative	
Test outcome	Test outcome positive	**True positive**	**False positive** (Type I error)	Precision = Σ True positive / Σ Test outcome positive
	Test outcome negative	**False negative** (Type II error)	**True negative**	Negative predictive value = Σ True negative / Σ Test outcome negative
		Sensitivity = Σ True positive / Σ Condition positive	Specificity = Σ True negative / Σ Condition negative	Accuracy



APPENDIX F

CBRS GOOGLE FORMS

Directions/Instrucciones

Please complete all 17 items in this survey by selecting the response number that best indicates how frequently the child exhibits the behavior described in a particular item.

The response numbers indicate the following:

1) The child NEVER exhibits the behavior described by the item.
2) The child RARELY exhibits the behavior described by the item.
3) The child SOMETIMES exhibits the behavior described by the item.
4) The child FREQUENTLY or USUALLY exhibits the behavior described by the item.
5) The child ALWAYS exhibits the behavior described by the item.

Instrucciones

Por favor complete todos los 17 artículos en esta encuesta, seleccionando el numero de la respuesta que mejor indica la frecuencia con la que el niño/a demuestre, el comportamiento descrito en un articulo en particular.

Los números de bajo indican lo siguiente:

1) El niño/a NUNCA demuestra el comportamiento escribido por el articulo.
2) El niño/a RARAMENTE demuestra el comportamiento escribido por el articulo.
3) El niño/a DE VES EN CUANDO demuestra el comportamiento escribido por el articulo.
4) El niño/a FREQUENTEMENTE demuestra el comportamiento escribido por el articulo.
5) El niño/a SIEMPRE demuestra comportamiento escribido por el articulo.

1. Observes rules & follows directions without requiring repeated reminders.*
Observa las reglas y sigue instrucciones sin necesidad de recordatorios repetidos.

1 2 3 4 5

Never (Nunca) ○ ○ ○ ○ ○ Always (Siempre)

2. Completes learning tasks involving 2 or more steps (e.g., cutting & pasting) in organized way.*
Completa las tareas de aprendizaje que implican 2 o mas pasos (e.j. cortar y pegar)

1 2 3 4 5

Never (Nunca) ○ ○ ○ ○ ○ Always (Siempre)

3. Completes tasks successfully.*
Completa tareas con éxito.

1 2 3 4 5

Never (Nunca) ○ ○ ○ ○ ○ Always (Siempre)

4. Attempts new, challenging tasks.*
Atenta nuevas tareas difíciles.

1 2 3 4 5

Never (Nunca) ○ ○ ○ ○ ○ Always (Siempre)

5. Concentrates when working on a task; is not easily distracted by surrounding activities.*
Se concentra cuando esta trabajando en tareas. No se desenfoca fácil con actividades

1 2 3 4 5

Never (Nunca) ○ ○ ○ ○ ○ Always (Siempre)

6. Responds to instructions & then begins an appropriate task without being reminded.*
Responde a las instrucciones y comienza apropiadamente hacer la tarea sin que le recuerden.

	1	2	3	4	5	
Never (Nunca)	○	○	○	○	○	Always (Siempre)

7. Takes time to do his/her best on a task.*
Toma tiempo para hacer su tarea lo mejor que pueda.

	1	2	3	4	5	
Never (Nunca)	○	○	○	○	○	Always (Siempre)

8. Finds & organizes materials & works in an appropriate place when activities are initiated.*
Encuentra y organiza los materiales y obras en un lugar apropiado cuando las actividades son hechas.

	1	2	3	4	5	
Never (Nunca)	○	○	○	○	○	Always (Siempre)

9. Sees own errors in a task & corrects them.*
Mira sus propios errores en su tares y los corrige.

	1	2	3	4	5	
Never (Nunca)	○	○	○	○	○	Always (Siempre)

10. Returns to unfinished tasks after interruption.*
Regresa a tarea que no esta terminadas después de estar interrumpido.

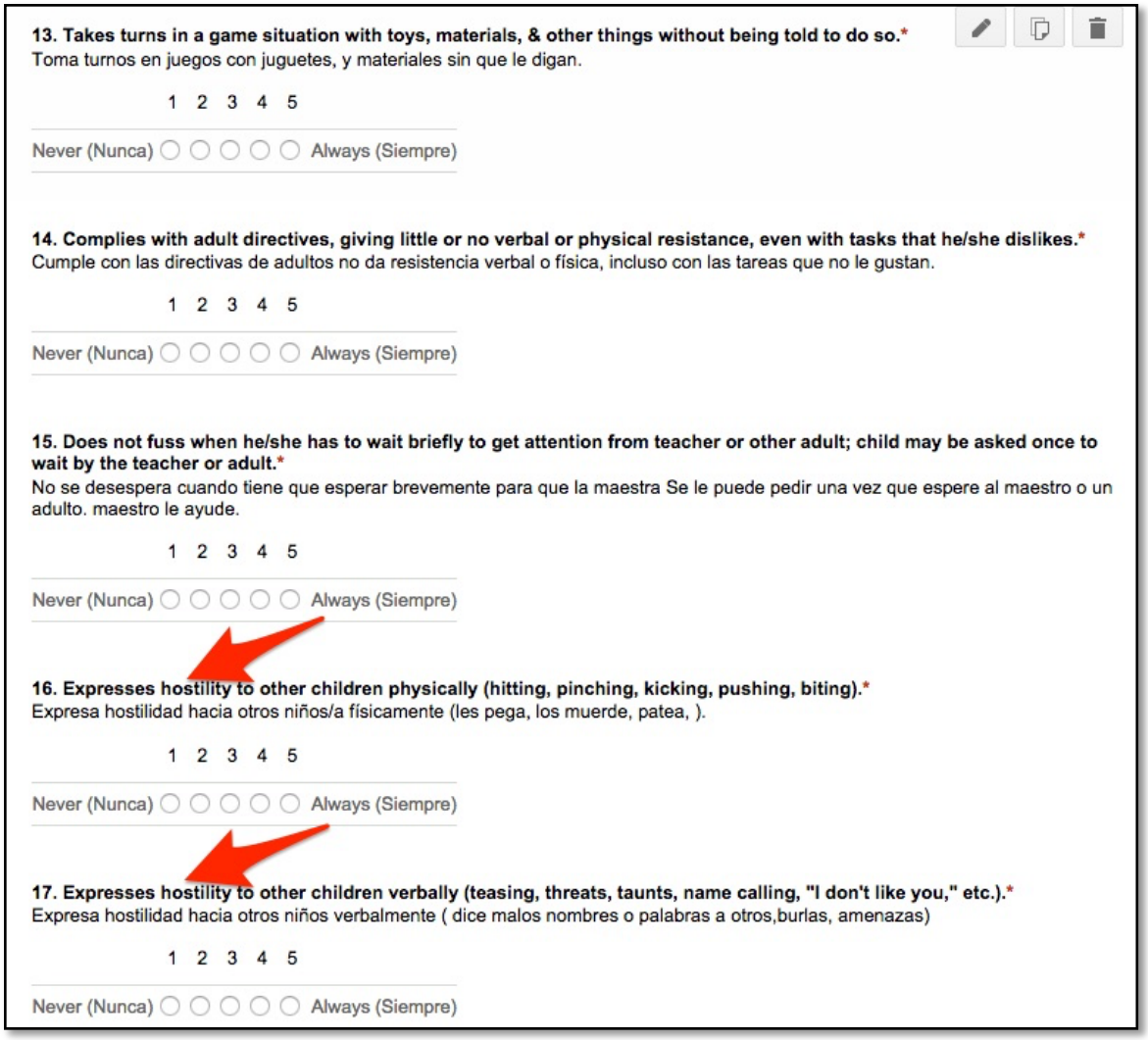
	1	2	3	4	5	
Never (Nunca)	○	○	○	○	○	Always (Siempre)

11. Willing to share toys or other things with other children when playing; does not fight or argue with playmates in disputes over property.*
Esta dispuesto a compartir juguetes y otras cosas con otros niños/a cuando esta jugando, y no se pone a pelear con compañeros sobre en donde están jugando.

	1	2	3	4	5	
Never (Nunca)	○	○	○	○	○	Always (Siempre)

12. Cooperative with playmates when participating in a group play activity, willing to give & take in the group, to listen to or help others.*
Cooperación con compañeros de juegos al participar en actividades de juegos de grupo, dispuesto a dar y recibir en el grupo, para escuchar o ayudar a los demás.

	1	2	3	4	5	
Never (Nunca)	○	○	○	○	○	Always (Siempre)



13. Takes turns in a game situation with toys, materials, & other things without being told to do so.*
Toma turnos en juegos con juguetes, y materiales sin que le digan.

1 2 3 4 5

Never (Nunca) ○ ○ ○ ○ ○ Always (Siempre)

14. Complies with adult directives, giving little or no verbal or physical resistance, even with tasks that he/she dislikes.*
Cumple con las directivas de adultos no da resistencia verbal o física, incluso con las tareas que no le gustan.

1 2 3 4 5

Never (Nunca) ○ ○ ○ ○ ○ Always (Siempre)

15. Does not fuss when he/she has to wait briefly to get attention from teacher or other adult; child may be asked once to wait by the teacher or adult.*
No se desespera cuando tiene que esperar brevemente para que la maestra Se le puede pedir una vez que espere al maestro o un adulto. maestro le ayude.

1 2 3 4 5

Never (Nunca) ○ ○ ○ ○ ○ Always (Siempre)

16. Expresses hostility to other children physically (hitting, pinching, kicking, pushing, biting).*
Expresa hostilidad hacia otros niños/a físicamente (les pega, los muerde, patea,).

1 2 3 4 5

Never (Nunca) ○ ○ ○ ○ ○ Always (Siempre)

17. Expresses hostility to other children verbally (teasing, threats, taunts, name calling, "I don't like you," etc.).*
Expresa hostilidad hacia otros niños verbalmente (dice malos nombres o palabras a otros,burlas, amenazas)

1 2 3 4 5

Never (Nunca) ○ ○ ○ ○ ○ Always (Siempre)

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