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# A preliminary investigation of the relationship between direct behavior rating and the Conners 3 teacher rating scale - short form

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A PRELIMINARY INVESTIGATION OF THE RELATIONSHIP BETWEEN  
DIRECT BEHAVIOR RATING AND THE CONNERS 3  
TEACHER RATING SCALE- SHORT FORM

An Abstract of a Thesis  
Submitted  
in Partial Fulfillment  
of the Requirements for the Degree  
Specialist in Education

Jessica Stodden Stumme  
University of Northern Iowa  
May 2015

## ABSTRACT

A growing body of evidence shows that Direct Behavior Rating (DBR) should continue to be examined as a method of behavior assessment to inform decisions about universal screening as well as progress monitoring for group or individual interventions.

Researchers have looked toward DBR as a potential method to capture levels of problem behavior for use in tiered problem solving models. Most research on DBR has focused on comparing its ratings against systematic direct observation. The current study examined the correlation between DBR ratings of academic engagement and disruptive behavior with the Conners 3-Teacher Short (Conners 3-T(S)) form. This is important because the Conners 3 ratings represent a standardized measure of the severity of problem behaviors relative to same age peers, and DBR has yet to be compared with a measure of behavioral severity. In the current study, the participants were classroom teachers of students identified as experiencing problem behaviors. Students were between the ages of 5-18 and were identified by the principal as experiencing behavioral difficulties in the classroom. The correlation between DBR and Conners 3-T(S) completed by classroom teachers were analyzed using Spearman's rho correlation coefficient. A strong positive correlation was found between DBR-Disruptive Behavior and the Conners 3-T(S) scale for Hyperactivity/Impulsivity. A moderate positive correlation was found between DBR-Academic Engagement and the Conners 3-T(S) Inattention scale. In addition, a moderate positive correlation was found between DBR-Disruptive Behavior and the Conners 3-T(S) scale Defiance/Aggression. None of the correlations were significant, and the lack of significant correlations likely resulted from a small sample size. These results suggest

that a future study with a larger sample should be conducted to establish the relationship between DBR and the Conners 3-T(S). If meaningful correlations are established it would indicate that DBR is not solely a measure of the frequency of problem behavior but also measures the severity of problem behavior. This may extend the usefulness of DBR for practitioners both for purposes of multi-tiered systems of support as well as progress monitoring individual and group interventions.

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has been approved as meeting the thesis requirement for the  
Degree of Specialist in Education

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## CHAPTER 1

### DIRECT BEHAVIOR RATING

#### School Based Behavior Assessment

With an increasing emphasis on using a problem solving approach and response to intervention approach to help identify and meet the needs of all children comes an increasing need for an assessment that measures various levels of school-based behaviors (Chafouleas, Volpe, Gresham, & Cook, 2010). In addition, the current emphasis on multi-tiered system of supports demand that educators match the level of intervention to the severity of the problem for all students and assess student response to intervention for both academics as well as social emotional or behavior outcomes. A multi-tiered system requires assessment practices that can determine student response to intervention at each level of the model from class-wide universal screening to the individual student level. While assessment procedures and practices for academic concerns have been developed and researched for system level to individual level intervention, assessment for social emotional or behavior interventions at each level are not as well developed (Chafouleas, Volpe et al., 2010).

For school psychologists to move from problem identifiers to problem solvers as the profession's training and practice guidelines recommend, practitioners need assessment tools and practices that demonstrate reliable and valid measurement and provide information that leads to effective interventions (Ysseldyke et al., 2006). Direct observation of student behavior is a more functional assessment practice than traditional standardized assessment techniques (Hintze, Volpe, & Shapiro, 2008).

Chafouleas (2011) notes that direct behavior assessment has focused on two primary methods: systematic direct observation (SDO) and behavior rating scales.

### Systematic Direct Observation

Systematic direct observation (SDO) is a direct observation method that has been widely regarded as the most appropriate behavior assessment method for quantifying problem behavior (Briesch, Chafouleas, & Riley-Tillman, 2010). Salvia, Ysseldyke, and Bolt (2010) summarize five steps that characterize SDO: precise and objective behavior definition, a specific characteristic of the behavior is measured (e.g. frequency count), highly standardized and objective procedures for recording are specified, time and location of the observation periods are specified, and standardized procedures are developed for scoring and summarizing data. Because this direct assessment method is highly standardized, strong interobserver agreement is obtained (Salvia et al., 2010). A direct measure of observed behaviors using SDO requires no inferences and stands as a valid measure of the behavior under observation.

The strength of SDO is that it involves a direct measure of student behavior since specifically defined behaviors are counted as they occur. Specific limitations of SDO are noted by a number of investigators and include the idea that SDO is resource intensive (Chafouleas, Volpe et al., 2010; Christ, Riley-Tillman, & Chafouleas, 2009; Riley-Tillman, Chafouleas, Sassu, Chanese, & Glazer, 2008). In a school setting, SDO requires a trained observer because this assessment method is highly standardized. In addition, multiple observations focused exclusively on the target student are required to reach an acceptable level of reliability. Volpe, McConaughy, and Hintze (2009) found that 14

observations of 10 minute duration would be necessary to reach a reliability of .80 for on-task behaviors. Hintze and Matthews (2004) also found SDO to be time intensive to reach acceptable reliability. SDO of on-task behavior was conducted twice a day for 15 minutes each across 10 school days. For one student, acceptable reliability of .80 or more was obtained after 14 observations while observations of another student did not reach that level of reliability until after 20 observation periods. A follow up analysis predicted it would take four observations a day for 40 days to reach a reliability coefficient of .83. Based on these studies, SDO requires between 2 hours and 20 minutes to 40 hours of observation to provide reliable measures of student behavior. In addition, SDO provides a brief sample of behavior rather than a summarization of behavior during the school day or part of a day (Briesch et al., 2010). Riley-Tillman et al. (2008) also mention the concern about the reactive effect that can occur when an external observer enters the classroom. The target student behavior as well as other students and teacher behavior can all be affected when an unfamiliar observer enters the classroom setting.

Response to intervention (RtI) and the problem solving approach require a behavior assessment tool or method that is brief enough to be feasible for daily use to estimate the level of a problem behavior and to monitor behavior change over time during an intervention. The usefulness of SDO as a means of measuring problem behaviors in a three-tiered approach may be limited for practical reasons. As noted by Chafouleas, Riley-Tillman, and Christ (2009) the resource intense nature of SDO likely limits its use to Tier 2 or Tier 3 behavior assessment. It would not be practical to use SDO for system-wide universal screening as required by Tier 1 applications. Likewise, standardized,

norm-referenced behavior rating scales are not efficient or repeatable for use on a large scale due to cost and time for completion and interpretation (Chafouleas, 2011).

Researchers have looked toward Direct Behavior Rating (DBR) as a potential method to capture levels of problem behavior for use in multi-tiered system of support models. DBR may be used to determine which students need supplemental supports for social behavior outcomes, and in turn, monitor behavior change once supplemental supports are implemented (Chafouleas, Riley-Tillman et al., 2009). Those interventions could occur at the group level such as targeted interventions (Tier 2 of a response to intervention model) or at the individual level such as intensive interventions at Tier 3 (Chafouleas, Sanetti, Kilgus, & Maggin, 2012).

In the introductory article of a special issue of *School Psychology Review* on behavior assessment, Chafouleas, Volpe et al., (2010) identify the qualities necessary for behavior assessments within a problem solving approach. Chafouleas, Volpe et al. (2010) indicate that behavior assessments within a response to intervention or problem solving system must be psychometrically adequate, feasible given limited resources, efficient and repeatable. DBR meets all of these qualities.

#### Definition of Direct Behavior Rating

DBR has been defined as “an evaluative rating that is generated at the time and place that behavior occurs by those persons who are naturally present in the context of interest” (Christ et al., 2009, p 205). DBR is a behavior assessment method that requires a rater, usually the classroom teacher, to quantify perceptions of a single, directly observed behavior on a simple scale (Chafouleas, Briesch et al., 2010). These types of brief ratings

of problem behavior on a simple scale (typically 0-3, 0-5 or 0-10) have been used to communicate with parents for a number of years and have been referred to by a variety of names: home-school notes, daily behavior reports, and daily report cards (Chafouleas, Riley-Tillman, Sassu, LaFrance & Patwa, 2007). Chafouleas (2011) described DBR as an assessment tool that combines the strengths of both SDO and behavior rating scales. In a review of the development of DBR, Christ et al., (2009) outline the defining characteristics of DBR as: directness of observation, observation of specific or global target behaviors, and the evaluative component of ratings. DBR has been the focus of recent research to understand its psychometric qualities and the parameters under which DBR can be useful in a school setting.

In addition to evidence of strong psychometric properties, it is important in a problem solving approach or response to intervention model that measures are sensitive to behavior change in order to use it as a method to monitor student progress over time (Tilly, 2008). In a response to intervention framework, student behavior is monitored frequently to assess students' response to intervention plans, whether it is a small group or an individual intervention. Behavior performance levels must be accurately captured so that the appropriate resources, supports, and instruction can be applied. According to Chafouleas et al., (2012) this use of behavior assessment requires the method to be efficient, repeatable, and sensitive enough to detect behavior change. DBR meets all of these qualities. The next section examines DBR sensitivity to behavior change.



### Sensitivity to Behavioral Change

As stated previously, it is essential that measurement of problem behaviors targeted for early response to intervention (RtI) assessments is both defensible and efficient (Chafouleas, Volpe et al., 2010; Chafouleas, Briesch et al., 2010). A study conducted by Chafouleas et al. (2012) investigated how sensitive Direct Behavior Rating-Single Item Scales (DBR-SIS) is to behavioral change. This is important in its use as a formative assessment tool when monitoring student progress over time. This study investigated whether DBR-SIS was sensitive to behavior change during intervention and whether these results would be similar to SDO measures. Participants included 20 self-identified teachers that had “one student whose behavior was both (a) problematic enough to warrant intervention, and (b) potentially responsive to intervention procedures” (Chafouleas et al., 2012, p. 494). Three problem behaviors were operationally defined: disruptive behavior, academic engagement and compliance. Teachers were asked to rate each behavior on a scale with three qualitative anchors and divided into 10 quantitative bands. Trained observers completed the SDO during activities when the student was expected to display the problem behavior. The research-based intervention that occurred was the Daily Report Card. The components of this intervention include: monitoring, providing feedback and reinforcing positive behavior.

The results indicated that during intervention both SDO and DBR-SIS data changed in the expected direction compared to baseline levels (Chafouleas et al., 2012). In general, both DBR and SDO data showed significant changes with decreased disruptive behaviors, increased academic engagement, and increased compliance over

baseline levels. The researchers also calculated other metrics to determine which were useful to capture the significance of the behavior change over baseline levels. Of the five methods calculated to measure change (absolute change, percent of non-overlapping data points, percentage of change, effect size, and reliable change index), DBR-SISs were found to be sensitive to behavior change using each method except the percent of non-overlapping data points. Chafouleas et al. (2012) suggested that a floor effect accounted for this result and concluded that the percent of non-overlapping data points metric might not have enough variability to detect behavior change.

There are several limitations to this study. First, the sample consisted of self-selected teachers, which can introduce bias. In future studies, it may be helpful to use random assignment to choose the participants. Secondly, this research used an A-B design “which does not provide for full evaluation of experimental control” (Chafouleas et al., 2012, p. 502) so a more rigorous experimental design could be used (Kazdin, 1994). In future studies, research should analyze the base rates of different target behaviors because it may be that the amount of change in response to different interventions could be expected based on where the behavior started prior to the intervention (Chafouleas et al., 2012).

#### Utility in a Response to Intervention Model

Given the research supporting the promising psychometric qualities of DBR it is important to examine how useful DBR can be for behavior assessment within a multi-tiered model. Chafouleas (2011) discussed the concept of using DBR as a general outcome measure for student behavior when three behavior constructs are operationally

defined. The three behaviors were: disruptive/nondisruptive, respectful/disrespectful, and academically engaged/academically unengaged. Chafouleas noted that the combination of these three behaviors has long been associated with social competence and positive school adjustment. In addition, Chafouleas suggested that DBR could be used as a general outcome measure of behavior for universal screening of all students when the three behaviors are combined into the one assessment. Chafouleas, Riley-Tillman et al. (2009) proposed that DBR could be used at a Tier 1 screening level with students nominated by teachers as at-risk in terms of social behavior. DBR could be conducted several times throughout the year for the nominated students as a screening measure. Presently, there are no other measurement tools that are direct measures of social behavior. Other potential measurement tools of social behavior are indirect measures. Chafouleas, Riley-Tillman et al., (2009) further proposed that DBRs could be completed more frequently as a formative assessment for Tier 2 and Tier 3 group or individual interventions. Chafouleas, Kilgus, and Hernandez (2009) found that DBR may hold potential as a screening tool. These researchers found moderate concurrent validity coefficients between DBR and Social Skills Rating System (SSRS). One feature of the SSRS as a norm referenced behavior rating scale is to determine social behavior risk status for students. Given the association between the two methods of behavior assessment, they concluded there may be potential for DBR to be a screening tool at the Tier 1 level. The researchers also noted the need for additional research as their study involved a single classroom sample of students with two teachers completing the SSRS for each student jointly.

Riley-Tillman, Methe, and Weegar (2009) examined the usefulness of DBR to monitor a class-wide intervention. The purpose of this study was to examine if a DBR could be used as a whole group measure of social behavior. In this study the group size was 14 students. One teacher completed a DBR for the whole group of 14 students rather than an individual rating for each of the students. A trained observer conducted SDO measurements. The results indicated that there was substantial agreement in the SDO and DBR data based on Cohen's Kappa statistic ( $\kappa=.657$  to  $.798$ ), and both data sources indicated similar class-wide trends in behavior during the phases of intervention. This study provides support for use of DBR as a method of formative assessment for a group intervention or at the class-wide level. In a multi-tiered system of support, DBR could serve as a screener at the Tier 1 assessment level.

While only a few studies used classroom settings and professional educators to examine the relationship between DBR and SDO, those studies generally demonstrated differences between raters in DBR, but provided evidence that ratings were consistent in terms of the DBR profile obtained (Briesch et al., 2010; Chafouleas, Briesch et al., 2010; Chafouleas, Christ, Riley-Tillman, Briesch & Chanese, 2007). This demonstrates usefulness for screening and progress monitoring purposes as long as ratings are completed by a single rater and not across raters. This supports the usefulness for DBR across all tiers in a multi-tiered system of support, including RtI.

Much of the research regarding DBR has examined the relationship between DBR and SDO, a direct count measuring the frequency of various behaviors. However, Chafouleas, Kilgus and Hernandez (2009) found moderate concurrent validity

coefficients between DBR and SSRS. As a norm-referenced standardized rating scale, the SSRS offers a measure of severity of behavior given that an individual is compared to a reference group and the amount of variance from the normative reference group is quantified within the score. The ratings on DBR are considered a measure of frequency of problem behavior, but may also be measuring dimensions of behavior related to severity such as intensity and duration.

### Measurement of Severity

While literature searches regarding the assessment of severity of problem behavior in children yield a number of results, none specifically elaborate on what components contribute to the concept of severity. According to Reynolds and Livingston (2014) norm-referenced interpretations are meaningful when the target student's performance on a measure is compared to a relevant reference group. Scores on the measure are then interpreted based on the reference group, which is typically a nationally representative sample. T-scores are a common standard score format with a mean of 50 and standard deviation of 10. The elevation of the T-score on a normative behavior rating scale is typically interpreted as amount of deviation from the reference group or normative sample (Reynolds & Livingston, 2014).

However, it is not apparent whether the amount of deviation from the reference group is related to severity. Likely this is because the elevated T-scores need to be interpreted based on the content validity of a scale as well as the item content to understand what contributes to an elevated score (Reynolds & Livingston, 2014). Some items relate to frequency and some relate to the seriousness of behavior, while yet other

items are related to the intensity of behavior or highly unusual behaviors. For example, on the Conners 3-T(S) teachers are asked to rate the following items from “Not true at all (Never, Seldom)” to “Very much true (Very often, Very frequently)”: “Talks out of turn” (frequency), “Bullies, threatens, or scares others” (seriousness), and “Is constantly moving” (intensity). The interpretation derives from the normative analysis of the scale and an inspection of critical items on the scale. The severity of behavior on the Conners 3 relates to the specific items contributing to the elevation of the scores. Currently, the ratings on DBR are considered a measure of frequency of problem behavior, but may also be measuring dimensions of behavior related to severity such as intensity and duration.

#### Statement of Purpose

Most research of DBR has focused on validating its use against systematic direct observation using frequency counts of academic engagement or disruptive behavior. The current study examined the relationship between DBR (ratings of academic engagement and disruptive behavior) with the Conners 3-T(S). This is important because the Conners 3 ratings represent a standardized measure of the severity of problem behaviors relative to same age peers. A significant correlation between classroom teacher DBR for disruptive behavior and DBR for academic engagement and the teacher’s ratings on the Conners 3-T(S) for various scales would suggest that DBRs are not purely a measure of the frequency of problem behavior, but also measure dimensions of behavior related to severity such as intensity and duration. This research would serve to extend the data supporting the use of DBR, broaden the dimension of problem behavior DBR is thought to measure, and further to examine the construct validity of DBR.

### Research Questions

1. To what extent is there a correlation between the median DBR score for disruptive behavior and the Conners 3-T(S) scores for Hyperactivity/Impulsivity and Defiance/Aggression?
2. To what extent is there a correlation between the median DBR score for academic engagement and the Conners 3-T(S) scores for Inattention, Hyperactivity/Impulsivity and Learning Problems/Executive Functioning?

## CHAPTER 2

### METHOD

#### Participants and Data Collection

During the spring and fall of 2013, classroom teachers completed multiple direct behavior ratings and the Conners 3-T(S) for a student in their classroom who was identified by the building principal as needing some behavioral progress monitoring due to behavior difficulties. The data were collected as one part of a larger, three-phase investigation approved by the University of Northern Iowa (UNI) Institutional Review Board prior to the start of data collection. Teachers completed a consent form to participate in this study. Parents of targeted students also signed consent to allow their students to participate and students assented in writing to participate in this study.

The student participants were between the ages of 5 to 18 (1 elementary and 4 secondary students) and were identified by the principal as experiencing behavioral difficulties in the classroom. Teacher participants were the classroom teacher of the identified students.

#### Measures

##### DBR

The DBR rating form (Appendix A) in this study asks for teacher ratings of two specific behaviors: academic engagement and disruptive behavior. These behaviors were operationally defined as the following:



1. *Academically Engaged* is actively or passively participating in classroom activity. For example: writing, raising hand, answering a question, talking about a lesson, listening to the teacher, reading silently, or looking at instructional materials.
2. *Disruptive* is student action that interrupts regular school or classroom activity, for example: out of seat, fidgeting, playing with objects, acting aggressively, talking/yelling about things that are unrelated to classroom instruction.

Teachers received the following directions:

Place a mark along the line that best reflects the percentage of total time the student exhibited each target behavior. Note the percentages do not need to total 100% across behaviors since some behaviors may co-occur.

Teachers were asked to rate both behaviors on a scale divided into ten intervals with three anchors provided at 0% (Never), 50% (Sometimes), and 100% (Always).

Reliability. Chafouleas, Christ et al., (2007) examined the psychometric properties of DBR and found that DBRs are likely to “approximate or exceed” reliability coefficients needed to guide low-stakes decisions, which is .70, after seven ratings have been collected over four to seven days. In addition, this study found DBRs are likely to approximate or exceed reliability coefficients needed to guide high-stakes decisions, which is .90, after 10 ratings. Further evidence related to the reliability of DBR was provided by Chafouleas, Breisch et al. (2010). Previous research indicated that 7-10 data points were required to make a reliable estimate of behavior. In this study with a middle school student sample of seven students and four raters, 10 data points were required to obtain a reliable rank order judgment about behavior while 20 data points were required

to make a reliable absolute judgment about behavior. In this study, rank-order judgments of behavior were more dependable than absolute ratings, so fewer data points were necessary to obtain reliability scores of .80.

Riley-Tillman, Christ, Chafouleas, Boice-Mallach and Briesch (2011) examined test-retest reliability at one week and found low to moderate reliability at a 10-minute observation duration (.31-.56) and low to high reliability at the 20-minute observation duration (.31-1.00).

Validity. In a study by Christ, Riley-Tillman, Chafouleas and Jaffrey (2011) the criterion-related validity coefficients were large at .67 to .78 when DBR-SIS was used for the globally defined behaviors of academic engagement and disruptive behavior. An additional study using professional educators in a kindergarten classroom setting examined the concurrent validity of DBR using the SSRS as a criterion measure (Chafouleas, Kilgus, & Hernandez, 2009). Two teachers jointly completed the SSRS in the fall and in the spring for each of 20 (fall) and 18 (spring) kindergarten students. One teacher completed a DBR-SIS for academic engagement and disruptive behavior for each student daily after the morning session and the other teacher completed the same measure for each student after the afternoon session. The results found a negative correlation between DBR for academic engagement with SSRS Social Skills and Problem Behavior Scales, which was expected. Academic engagement DBR was not correlated with the SSRS Academic Competence Scale. DBR for disruptive behavior was positively correlated with the Social Skills and Problem Behavior Scales, but not correlated with the Academic Competence Scale of the SSRS. There were stronger associations in the fall

rating period than in the spring. The authors noted the results provide preliminary evidence for the concurrent validity of DBR given the moderate to strong correlation with SSRS, but cited the limitations on generalizability of these given that the sample was a single classroom. Evidence for DBR reliability and validity is beginning to accumulate.

### Conners 3-T(S)

The Conners 3-T(S) is a standardized assessment composed of 41 items and yielding 5 scaled scores. The scaled scores are derived by comparing the target student with same age, same gender peers. A T-score is obtained for each of the five scales: Inattention, Hyperactivity/Impulsivity, Learning Problems/Executive Functioning, Defiance/Aggression, and Peer Relations. The Conners 3-T(S) has strong psychometric adequacy and discriminant validity.

Reliability. The reliability for internal consistency (Cronbach's alpha) is 0.91 (ranging from 0.87 to 0.94) with test-retest reliability of 0.78 (ranging from 0.70 to 0.83) when conducted 2-4 weeks apart, and an inter-rater reliability of 0.77 (ranging from 0.72 to 0.83). In addition, the internal consistency reliability scores for the individual scales are excellent: Inattention is 0.94, Hyperactivity/Impulsivity is 0.94, Learning Problems/Executive Functioning is 0.87, Aggression is 0.89 and Peer Relations is 0.93. On the Inattention scale reliability scores ranged from 0.92 to 0.94 for males, and 0.92 to 0.95 for females. On the Hyperactivity/Impulsivity scale reliability scores ranged from 0.93 to 0.94 for males, and 0.92 to 0.94 for females. On the Learning Problems/Executive Functioning scale reliability scores ranged from 0.84 to 0.88 for males, and 0.83 to 0.88 for females. On the Aggression scale reliability scores ranged from 0.87 to 0.91 for males,

and 0.87 to 0.89 for females. On the Peer Relations scale reliability scores ranged from 0.91 to 0.94 for males, and 0.92 to 0.93 for females (Conners, 2008).

Validity. In addition to high reliability, there is evidence to support the validity of the Conners 3-T(S) score interpretation. The Conners 3-T(S) has a high correlation with the Conners 3 Full Length form, ranging between 0.96 to 0.98 for the various scales. Confirmatory factor analyses demonstrated that the intercorrelations of the Conners 3-T(S) scales were all significant ( $p < .001$ ) ranging from 0.41 to 0.84. The confirmatory factor analysis indicated that the model was an adequate fit to the data: Normed Fit Index (NFI = .91), Non-Normed Fit Index (NNFI = .91), Comparative Fit Index (CFI = .92), and Root Mean Square Error of Approximation Index (RMSEA = .08). This means that the content of the scales make conceptual sense because the second set of data fit the model that was expected. Across-informant correlations (parent to teacher, parent to youth, and teacher to youth) were moderate among the comparisons ranging from 0.49 to 0.59. This suggests that there is consistency but not redundancy among the Conners 3(S) forms: parent, teacher, and self-report (Conners, 2008).

The Conners 3-T(S) scores were correlated with scores from other measures of student behavior to demonstrate convergent validity. Correlations between the Conners 3-T(S) and the prior version of the Conners rating scale (Conners' Rating Scales-Revised, CRS-R) were statistically significant at the 0.01 level for scales that measured similar constructs, ranging from 0.40 to 0.96. Similar high correlations were found between the Conners 3-T(S) and the Behavior Assessment System for Children, Second Edition, Teacher Rating Scales (BASC-2 TRS) for both the children and adolescent scales

(Conners, 2008). All similar constructs were significantly correlated. Additionally, correlations between highly related constructs were statistically significant between the Achenbach System of Empirically Based Assessment (ASEBA) Teacher Report Form (TRF) and the Conners 3-T(S) and Behavior Rating Inventory of Executive Function (BRIEF) teacher rating form (Conners, 2008). Collectively, this evidence demonstrates strong convergent validity for the Conners 3-T(S) (Conners, 2008).

To demonstrate discriminant validity Conners 3-T(S) scales were analyzed for the following clinical groups: Disruptive Behavior Disorders (i.e., Conduct Disorder, Oppositional Defiant Disorder), Learning Disorders (i.e., Disorder of Written Expression, Mathematics Disorder, and Reading Disorder), ADHD Inattentive, ADHD Hyperactive-Impulsive, and ADHD Combined. Overall, the Conners 3-T(S) scales accurately predicted the clinical classification 72.2% of the time (Conners, 2008).

As a standardized assessment measure, the elevation of the T-score indicates the classroom teacher has more concerns about the target student's functioning in a specific area than is typical for same age and same gender peers (Conners, 2008). Because higher scores on the Conners 3-T(S) are associated with greater number of reported concerns, the Conners 3-T(S) is a standardized measure of the severity of the problem behavior relative to same age, same gender peers. Teachers are asked to provide ratings based on how strongly a statement describes a student during the past month. For example, teachers are asked to rate the inattentiveness, movement, impulsivity, and mood of the student. Teachers may rate the student based on how often the behavior occurs, the

intensity level of the behavior, or the duration of the behavior because the administration directions do not specifically ask teachers to rate any particular dimension of the behavior.

### Procedures

The classroom teachers received a short online training on the administration of the Direct Behavior Ratings and emailed a completion certificate to the researchers involved in collecting the data. A graduate research assistant (GRA) trained in SDO conducted systematic direct observations of the targeted students at the same time period the classroom teachers provided instruction. At the conclusion of the observation period, the GRA gave the teacher a direct behavior rating sheet and the teacher made their rating of the student's behavior (20 direct behavior ratings across 10 non-consecutive days). The teacher also completed the Conners 3-T(S) once during the series of observations.

### Data Analyses

The relationship between the Conners 3-T(S) and classroom teacher DBR of student behavior was analyzed using Spearman *rho* correlation coefficient. The Conners 3-T(S) yielded a T-score for five scales: Inattention, Hyperactivity/Impulsivity, Learning Problems/Executive Functioning, Defiance/Aggression, and Peer Relations. A total of 10 scatterplots were created; one for each pairing of Direct Behavior Rating - Academic Engagement (DBR-AE) with the five Conners 3 scales and one for each pairing of Direct Behavior Rating - Disruptive Behavior (DBR-DB) with the five Conners 3 scales. The scatterplots were visually analyzed to determine if a monotonic relationship existed between the variables (an assumption of Spearman *rho* correlation coefficient; Lund & Lund, 2013).

The correlations between the T-scores for each scale and the median DBR score for disruptive behavior and the median DBR for academic engagement were analyzed using the Spearman *rho* correlation coefficient.

## CHAPTER 3

### RESULTS

#### Academic Engagement

Five scatterplots were created to determine if there was a monotonic relationship between Direct Behavior Rating – Academic Engagement (DBR-AE) and each of the Conners 3 Scales: Inattention scale (Figure 1), Hyperactivity/Impulsivity scale (Figure 2), Learning Problems/Executive Functioning scale (Figure 3), Defiance/Aggression scale (Figure 4), and Peer Relations scale (Figure 5). Using visual analysis, it was found that a generally monotonic relationship did exist between DBR-AE and the Conners 3 Inattention scale and with the Peer Relations scale. However, a monotonic relationship did not exist between DBR-AE and the remaining Conners 3 scales listed above.

A Spearman *rho* correlation coefficient was calculated to analyze the relationship between Direct Behavior Rating - Academic Engagement (DBR-AE) and the Conners 3 scales (see Table 1). Referring to Cohen's (1998) effect sizes for behavioral sciences, correlations between 0.10 and 0.30 are considered weak, correlations between 0.30 and 0.50 are considered moderate, and correlations greater than 0.50 are considered strong. A strong, positive correlation that was not significant was found with the Inattention scale ( $r_s(3) = .605, p > .05$ ). In this study, DBR-AE is not significantly correlated with the Conners 3- Inattention scale. The remaining Spearman *rho* correlation coefficients representing the relationship between DBR-AE and the remaining Conners 3 scales are shown in Table 1 and are as follows: a moderate, negative correlation that was not significant was found with the Hyperactivity/Impulsivity scale ( $r_s(3) = -.308, p > .05$ ); a



weak, negative correlation that was not significant was found with the Learning Problems/Executive Functioning scale ( $r_s(3) = -.289, p > .05$ ); a weak, positive correlation that was not significant was found with the Defiance/Aggression scale ( $r_s(3) = .237, p > .05$ ); and a moderate, positive correlation that was not significant was found with the Peer Relations scale ( $r_s(3) = .359, p > .05$ ). In this study, DBR-AE is not significantly correlated with any of the five Conners 3 scales.

### Disruptive Behavior

Five scatterplots were created to determine if there was a monotonic relationship between Direct Behavior Rating – Disruptive Behavior (DBR-DB) and each of the Conners 3 Scales: Inattention scale (Figure 6), Hyperactivity/Impulsivity scale (Figure 7), Learning Problems/Executive Functioning scale (Figure 8), Defiance/Aggression scale (Figure 9), and Peer Relations scale (Figure 10). Using visual analysis, it was found that a monotonic relationship did exist between DBR-DB and the Hyperactivity/Impulsivity scale as well as the Defiance/Aggression scale. However a monotonic relationship was not evident between DBR-DB and the Inattention scale, Learning Problems/Executive Functioning scale or the Peer Relations scale.

A Spearman *rho* correlation coefficient was calculated to analyze the relationship between Direct Behavior Rating – Disruptive Behavior (DBR-DB) and the Conners 3 scales (see Table 2). Using the same Cohen's (1998) effect sizes criteria for behavioral sciences, correlations between 0.10 and 0.30 are considered weak, correlations between 0.30 and 0.50 are considered moderate, and correlations greater than 0.50 are considered strong. A weak, negative correlation that was not significant was found with the

Inattention scale ( $r_s(3) = -.289, p > .05$ ). In this study, DBR-DB is not significantly related to the Conners 3- Inattention scale. The remaining Spearman rho correlation coefficients representing the relationship between DBR-DB and the remaining Conners 3 scales are displayed in Table 2 and are as follows: a strong, positive correlation that was not significant was found with the Hyperactivity/Impulsivity scale ( $r_s(3) = .872, p > .05$ ); a weak, positive correlation that was not significant was found with the Learning Problems/Executive Functioning scale ( $r_s(3) = .237, p > .05$ ); a strong, positive correlation that was not significant was found with the Defiance/Aggression scale ( $r_s(3) = .658, p > .05$ ); and a weak, positive correlation that was not significant was found with the Peer Relations scale ( $r_s(3) = .205, p > .05$ ). In this study, DBR-DB was not significantly correlated with any of the five Conners 3 scales.

## CHAPTER 4

### DISCUSSION

This preliminary study was specifically designed to examine the relationship between DBR measurement of academic engagement and disruptive behavior with the subscale scores of the Conners 3-T(S). In this study, Direct Behavior Rating-Academic Engagement (DBR-AE) was not significantly correlated with the Conners 3 subscale scores. In addition, the Direct Behavior Rating-Disruptive Behavior (DBR-DB) was not significantly correlated with the Conners 3 subscale scores.

Despite having a limited sample size, the correlation between DBR-DB and the Conners 3- Hyperactivity/Impulsivity scale was approaching a significant level ( $p < .054$ ). A table of critical values for the significance of the Spearman *rho* correlation coefficient indicates that the correlation for a sample size of five would need to be 1.00 to obtain significance at the  $p < .05$  level. Finding a correlation that approaches significance with the limited sample size in this preliminary study indicates it is worthwhile to replicate this study with a large sample size to determine if meaningful correlations exist.

In addition, Ravid (2010) discusses the importance of looking at the strength of the correlation coefficients and not relying solely on the significance level of the correlations depending on the purpose and use of the correlation. Several of the correlations obtained in this preliminary study were in the strong to moderate range. Those include DBR-AE with the Inattention scale and the Peer Relations scale as well as DBR-DB with the Hyperactivity/Impulsivity scale and the Defiance/Aggression scale. The strong, positive DBR-DB correlations with the Hyperactivity/Impulsivity and

Defiance/Aggression scales seem logical given the items that contribute to each scale. If teachers provided a high score on DBR-DB you would expect to see items endorsed on the Conners 3 scales that relate to hyperactivity/impulsivity and defiance/aggression. Examples for the Hyperactivity/Impulsivity scale include being inattentive, easily distractible, and easily sidetracked. Examples for the Defiance/Aggression scale include items regarding bullying, threatening, or scaring others, and refusing instructions or prompts from adults. The items on those scales describe behaviors that could disrupt the learning environment.

A strong, positive correlation was found between DBR-AE and the Conners 3-Inattention scale. This correlation would have been expected to be a negative correlation. This could be due to error or the small sample size. Further research with a larger sample size may be more definitive. Similarly, the moderate, positive correlation found between DBR-AE and the Conners 3-Peer Relations scale is not in the expected direction. It would be expected for a student with high academic engagement to have the skills to work well with peers; therefore the Conners 3-Peer Relations scale would not be elevated. This finding could also be due to error or the small sample size. Further research with a larger sample size may be more definitive.

Finding this degree of relationship suggests DBR may be measuring more than frequency of the behaviors being rated, but may also measure a dimension of severity such as intensity, duration or seriousness. While this research has not yet been conducted because the body of research on DBR has used SDO for validation which is focused on frequency, teachers are asked to respond to DBR for both academic engagement and

disruptive behavior regarding the percentage of total time the student engages in the behavior with anchors at 0%-never, 50%-sometimes, and 100%- always. These anchors may convey more than frequency since proportion of time could relate to duration or intensity in addition to frequency.

### Limitations

The data set from this preliminary study contained ratings of five students, which is a small sample size for statistical analyses. The small sample size impacted the statistical analyses that were used to obtain correlations. For example, ideally the sample of ratings would be normally distributed with a larger number of ratings and the Pearson's correlation coefficient could have been used. However, since the visual analysis indicated that there were monotonic relationships between only a portion of the pairs of variables, the data should be interpreted with caution.

A small sample size also impacted the significance level of the analyses. A table of critical values for the significance of the Spearman rho correlation coefficient indicates that the correlation for a sample size of five would need to be 1.00 to obtain significance at the  $p < .05$  level. Since none of the correlation coefficients were 1.00 no significance was obtained. The data should be interpreted with caution because the small sample size makes it impossible to determine if the moderate to strong correlations were due to error or an actual relationship among variables.

### Implications for Practice

Implications for practice would have to come from future research replicating this study with a larger sample size. The correlation between DBR-DB and the Conners 3 –

Hyperactivity/Impulsivity scale was approaching significance with a small data set, so replicating this study with a larger sample size would be more conclusive about the relationship between the measures. It is possible that DBR ratings are measuring more than frequency of behaviors, but a study with a larger sample size would need to be conducted to establish that DBR may also be measuring an element of severity, such as intensity or duration of behaviors.

DBR has been shown to be useful for progress monitoring for individual and class-wide interventions, so the utility of DBR for individual and small group applications had been demonstrated. DBR has been useful as a screening tool at the universal level in a multi-tiered system of support. Given the valuable DBR characteristics of psychometric adequacy, feasibility given limited resources, efficiency and repeatability practitioners may gain a highly accurate method to measure social behaviors at all levels of a multi-tiered system of supports.

Understanding the severity of problem behavior is important to practitioners because it provides an indication of how much a problem behavior is disrupting the learning environment. For example, a problem behavior can occur frequently yet not disrupt the learning of other students. However, if severity is an element of DBR, a higher DBR rating would imply the behavior may be disruptive to more than the individual student being rated and that could be critical information for practitioners in understanding the problem behaviors. A teacher might rate the behavior high on the DBR frequency scale, when really the frequency of the behavior was low but the intensity or seriousness of the behavior was high. This difference puts into question the construct

validity of the DBR. The strong to moderate correlations with the Conners 3-T(S) suggest that researchers and practitioners may interpret the DBR with respect to dimensions of behavior other than frequency. Further research is needed to examine if DBR measures another dimension of behavior other than frequency.

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Table 1

*Spearman's rho Direct Behavior Rating- Academic Engagement correlations with Conners-3 scales*

		C3-IN	C3-HYP	C3-LP	C3-AG	C3-PR
DBR-AE	Correlation coefficient	.605	-.308	-.289	.237	.359
	Sig. (2-tailed)	.279	.614	.637	.701	.553

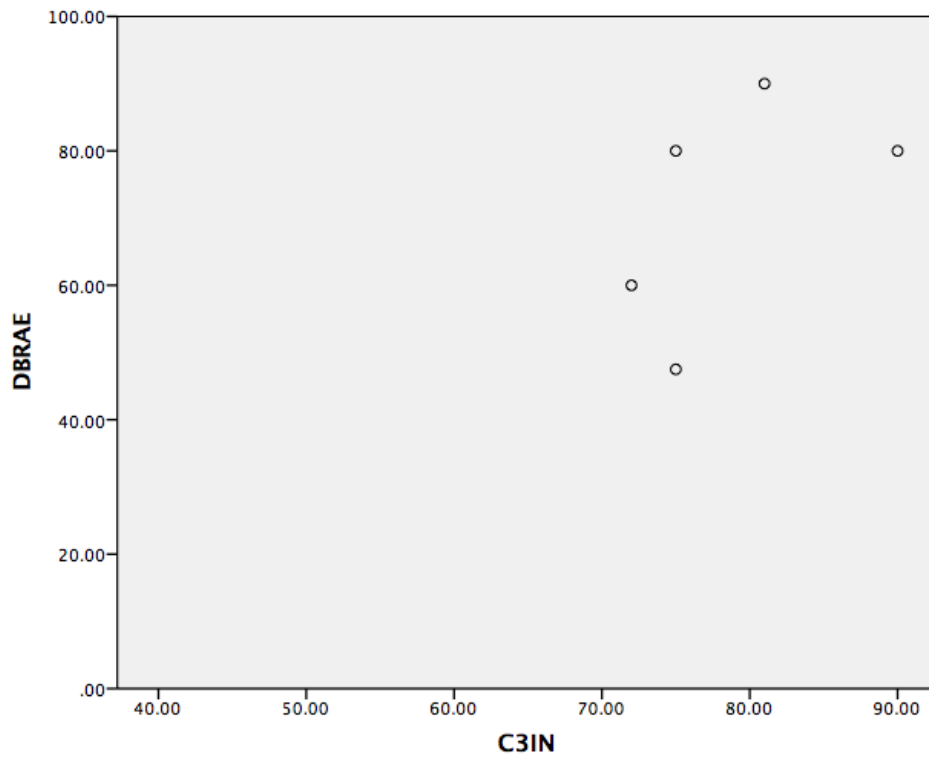
*Note.* DBR- AE = Direct Behavior Rating- Academic Engagement; C3-IN = Conners 3-Inattention scale; C3-HYP = Conners 3-Hyperactivity/Impulsivity scale; C3-LP = Conners 3- Learning Problems/Executive Functioning scale; C3-AG = Conners 3-Defiance/Aggression scale; C3-PR = Conners 3-Peer Relations Scale

Table 2

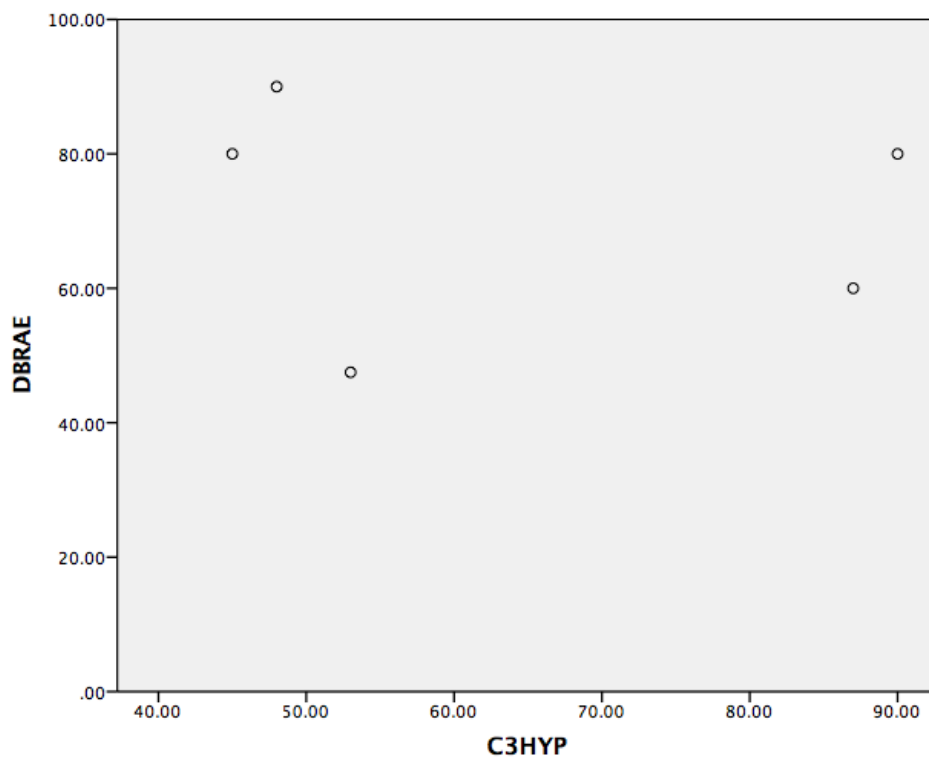
*Spearman's rho Direct Behavior Rating- Disruptive Behavior correlations with Conners-3 scales*

		C3-IN	C3-HYP	C3-LP	C3-AG	C3-PR
DBR-DB	Correlation coefficient	-.289	.872	.237	.658	.205
	Sig. (2-tailed)	.637	.054	.701	.227	.741

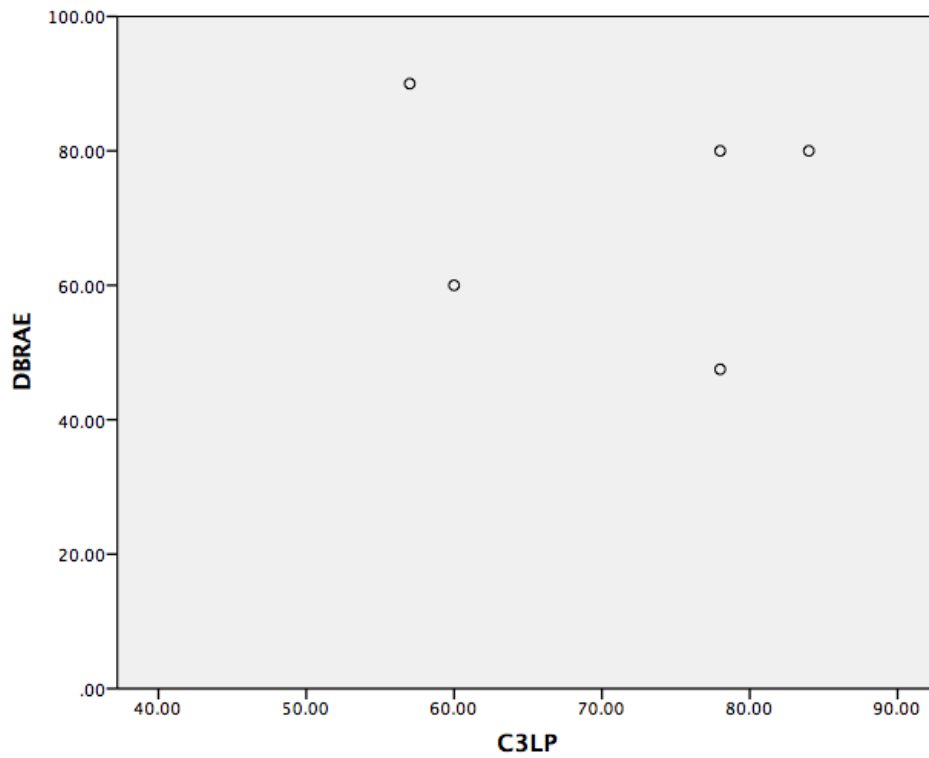
*Note.* DBR- DB = Direct Behavior Rating- Disruptive Behavior; C3-IN = Conners 3-Inattention scale; C3-HYP = Conners 3-Hyperactivity/Impulsivity scale; C3-LP = Conners 3- Learning Problems/Executive Functioning scale; C3-AG = Conners 3-Defiance/Aggression scale; C3-PR = Conners 3-Peer Relations Scale



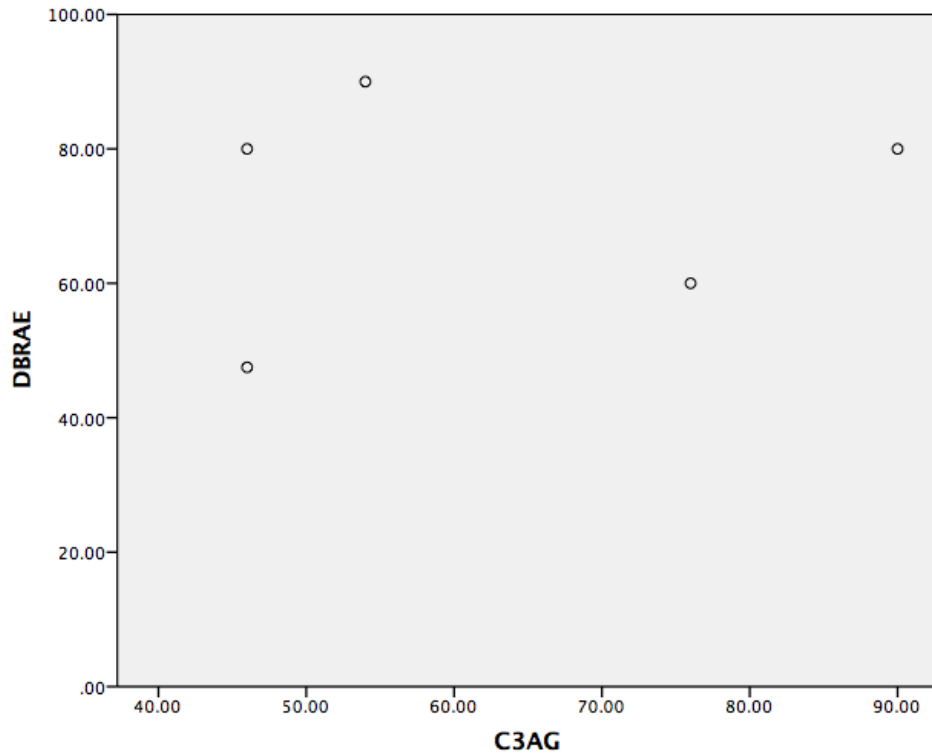
*Figure 1.* Scatterplot of Direct Behavior Rating – Academic Engagement (DBR-AE) and Conners 3 - Inattention scale.



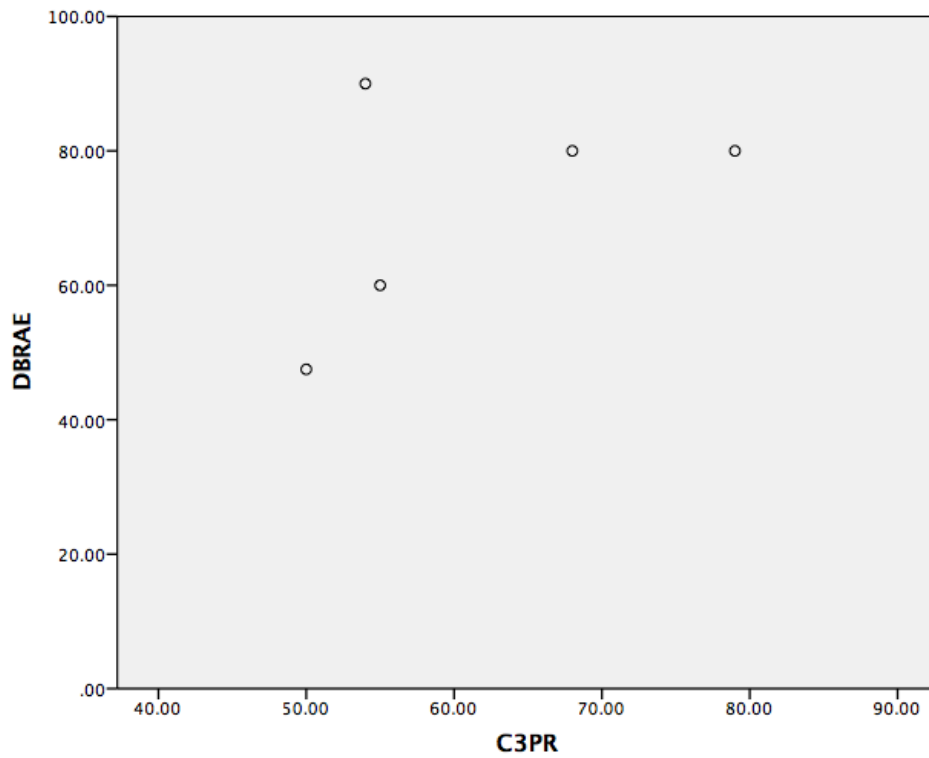
*Figure 2.* Scatterplot of Direct Behavior Rating – Academic Engagement (DBR-AE) and Conners 3 - Hyperactivity/Impulsivity scale.



*Figure 3.* Scatterplot of Direct Behavior Rating – Academic Engagement (DBR-AE) and Conners 3 - Learning Problems/Executive Functioning scale.

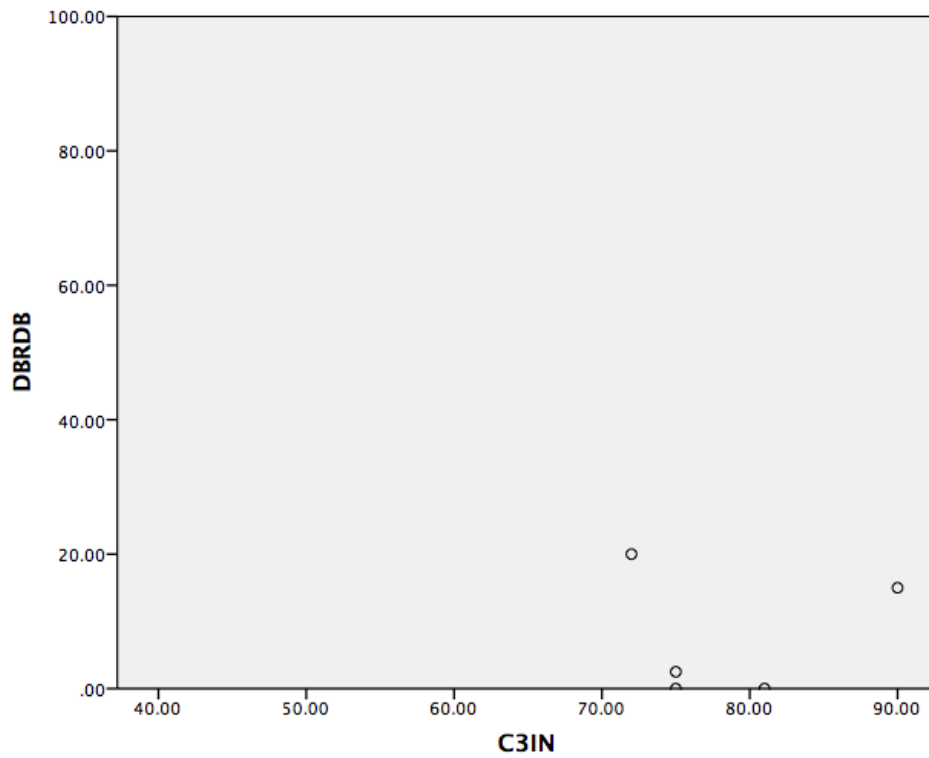


*Figure 4.* Scatterplot of Direct Behavior Rating – Academic Engagement (DBR-AE) and Conners 3 - Defiance/Aggression scale.

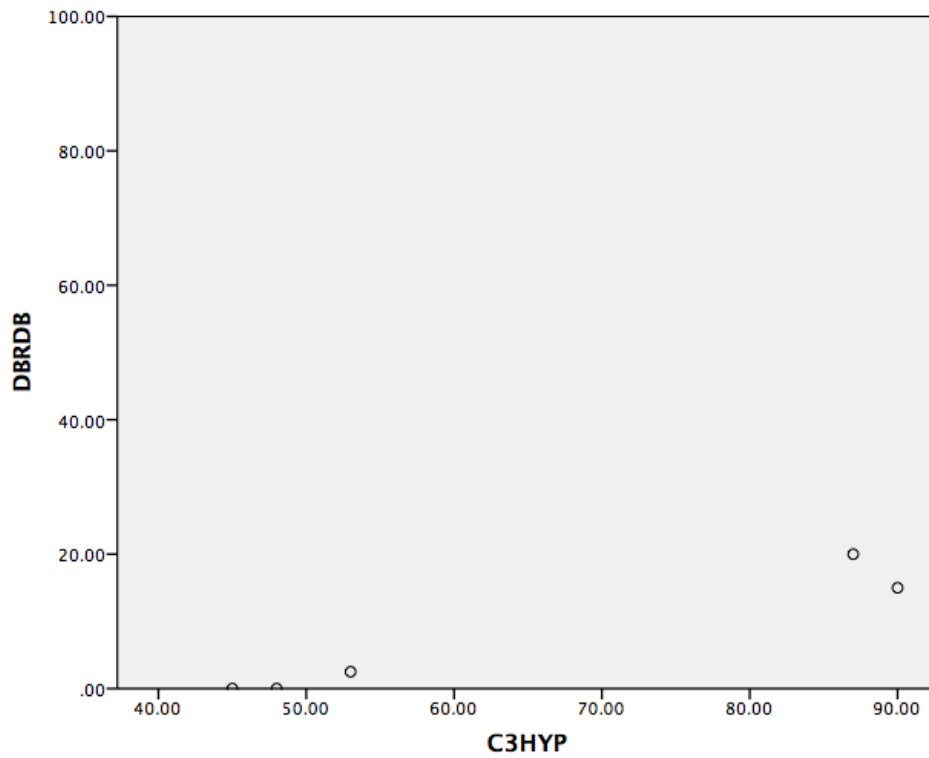


*Figure 5.* Scatterplot of Direct Behavior Rating – Academic Engagement (DBR-AE) and Conners 3 - Peer Relations scale.

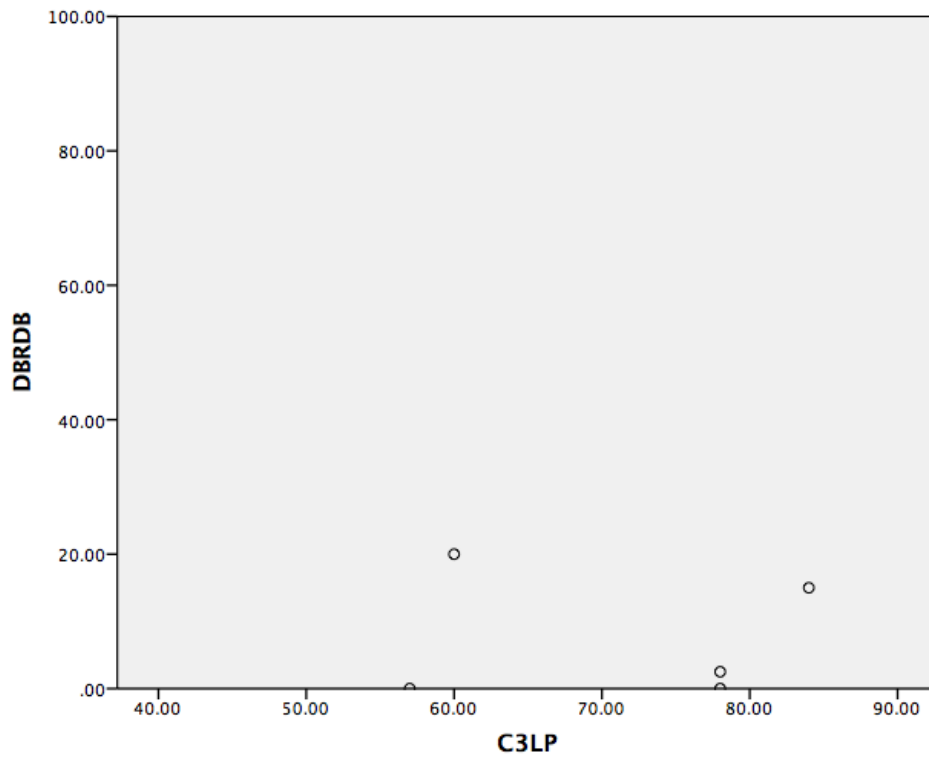




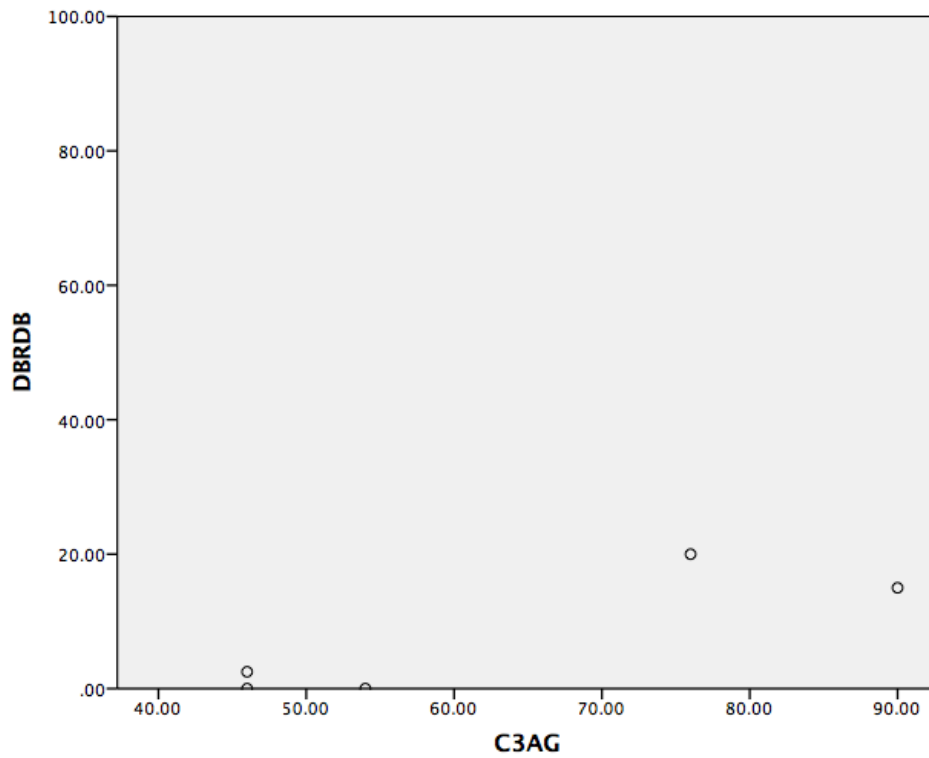
*Figure 6.* Scatterplot of Direct Behavior Rating – Disruptive Behavior (DBR-DB) and Conners 3 - Inattention scale.



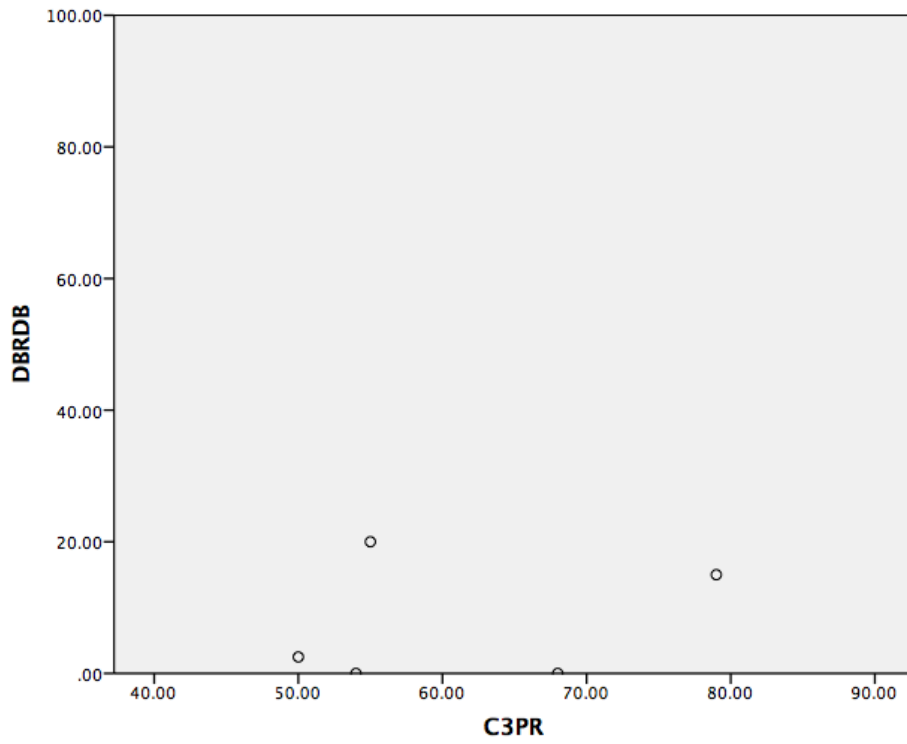
*Figure 7.* Scatterplot of Direct Behavior Rating – Disruptive Behavior (DBR-DB) and Conners 3 - Hyperactivity/Impulsivity scale.



*Figure 8.* Scatterplot of Direct Behavior Rating - Disruptive Behavior (DBR-DB) and Conners 3 - Learning Problems/Executive Functioning scale.



*Figure 9.* Scatterplot of Direct Behavior Rating - Disruptive Behavior (DBR-DB) and Conners 3 - Defiance/Aggression scale.



*Figure 10.* Scatterplot of Direct Behavior Rating - Disruptive Behavior (DBR-DB) and Connors 3 - Peer Relations scale.

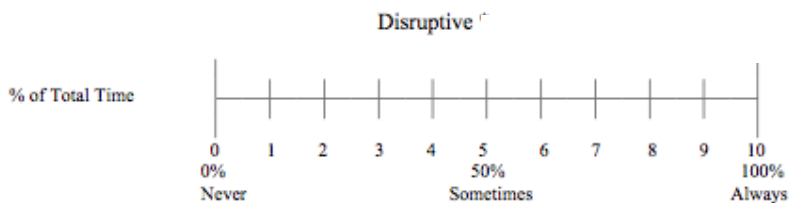
## APPENDIX

## DIRECT BEHAVIOR RATING (DBR) FORM: 2 STANDARD BEHAVIORS

Date  M T W Th F	Student	Instruction description:
	Teacher:	
Observation Time: Start: _____ End: _____	Behavior Descriptions: <b>Academically Engaged</b> is actively or passively participating in classroom activity. For example: writing, raising hand, answering a question, talking about a lesson, listening to the teacher, reading silently, or looking at instructional materials.  <b>Disruptive</b> is student action that interrupts regular school or classroom activity, for example: out of seat, fidgeting, playing with objects, acting aggressively, talking/yelling about things that are unrelated to classroom instruction	

**Directions:** place a mark along the line that best reflects the percentage of total time the student exhibited each target behavior. Note the percentages do not need to total 100% across behaviors since some behaviors may be co-occur.

### Academically Engaged



### Disruptive Behavior

