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The Brief Student–Teacher Classroom Interaction Observation: Using Dynamic Indicators of Behaviors in the Classroom to Predict Outcomes and Inform Practice

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Abstract

Measures that can be used to identify malleable, dynamic indicators of teacher practices that lead to or are associated with student outcomes are needed to inform classroom interventions and consultation practices with teachers. The purpose of this study was to evaluate and validate the Brief Student–Teacher Classroom Interaction Observation in elementary classrooms (Grades K–3). A universal sample of 896 students was observed during classroom instruction. The measure was utilized to gather information on how teachers interacted with students with regard to their use of positive versus negative feedback during a 5-min window at the start of the school year. Findings indicate that students who received more negative feedback than positive feedback from their teacher were rated at the end of the year as having a significant increase in problems with emotion regulation, concentration problems, and observed disruptive behavior, whereas students who received more positive feedback demonstrated significant increases in prosocial behaviors. Implications for how this brief 5-min observation can be used to inform teacher practice and identify students at the start of the year in need of additional supports are discussed.

Keywords

classroom management, direct observation, consultation

Student–teacher interaction patterns are strong predictors of behavioral and academic outcomes (Fowler, Banks, Anhalt, Der, & Kalis, 2008; Hamre & Pianta, 2001). Students with frequent negative interaction patterns with teachers experience lower ratings of social competence, less praise, more disciplinary infractions, and poorer academic outcomes (Birch & Ladd, 1997). In fact, a growing body of research has established the reciprocal nature of teacher and student interactions in the classroom. For example, Skinner and Belmont (1993) studied the relationship among teacher practices and the active engagement of students. They uncovered an interaction pattern in which student engagement in the classroom elicited positive teacher behavior, which in turn elicited further student engagement. Conversely, they found that the absence of student engagement elicited negative teacher attention, which in turn elicited further student disengagement. Similarly, Sutherland and Wehby (2001) demonstrated that when a teacher praised a student the teacher was more likely to follow the praise with an opportunity to respond (OTR). Correct student responses to the OTR occasioned additional praise from the teacher and increased the likelihood of another OTR. Furthermore, when appropriate student behavior is followed by teacher attention, the rate of appropriate behavior demonstrated by the student increases (Becker, Madsen, Arnold, & Thomas, 1967; Madsen, Becker, & Thomas, 1968). Such reciprocal interactions based on principles of reinforcement can lead to positive outcomes of increased task engagement and academic achievement.

However, studies also indicate that teachers can unwittingly engage in a negative reinforcement pattern similar to Patterson's coercive interaction cycle (Patterson, Reid, & Dishion, 1992) that actually amplifies students' inappropriate behavior. Gunter and his colleagues (Gunter & Coutinho, 1997; Gunter, Denny, Jack, Shores, & Nelson, 1993; Gunter et al., 1994) found that negative interactions between students with challenging behavior and their teachers are 7 times more prevalent than positive interactions. Moreover, they found that appropriate behavior was seldom praised or otherwise reinforced by the teachers. Furthermore, students with challenging behaviors tend to receive less instruction from their teachers and are more likely to be engaged in

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ongoing coercive interactions that increase in intensity over time (Carr, Taylor, & Robinson, 1991). Teachers may avoid interacting with students with challenging behavior and will instead direct their attention and effort to students with more appropriate behavior (Wehby, Symons, Canale, & Go, 1998). Nelson and Roberts (2000) found that students with high rates of problem behavior are more likely to receive a reprimand following a disruption, while their less disruptive peers were more likely to receive a redirect following a disruption. Furthermore, Van Acker, Grant, and Henry (1996) reported that students with aggressive behavior are almost twice as likely to be reprimanded as their less aggressive peers for the same infraction of the rules.

Thus, interactions between teachers and students have emerged as an important factor associated with later school adjustment and social, emotional, and behavioral outcomes (Hamre & Pianta, 2001; Henricsson & Rydell, 2004; Ladd & Burgess, 1999). Students with chronic behavior problems are more likely to develop negative relationship patterns with their teachers (Ladd & Burgess, 1999). Recently, Doumen and colleagues (2008) found that students displaying aggressive behavior at the start of kindergarten had increases in student–teacher conflict midyear, which was subsequently associated with increases in aggressive behavior at the end of the school year.

Student Demographics and Student–Teacher Interactions

Notably, negative interaction patterns are more likely to occur for some students based on their sociodemographic characteristics. Boys, students from diverse racial and ethnic backgrounds, and students from families of low economic means are more likely to experience a range of deleterious academic outcomes such as office discipline referrals (Bradshaw, Mitchell, O'Brennan, & Leaf, 2010), school suspension and expulsion, special education placement for emotional disturbance, and school dropout. In particular, both race and poverty exert independent effects on the likelihood and type of special education placements, with African American students being 1.5 times as likely to be identified as having emotional disturbances as other students, yet half as likely to be identified with specific learning disabilities (Skiba, Poloni-Staudinger, Simmons, Feggins-Azziz, & Chung, 2005). From a social capital perspective, students from diverse backgrounds may come to school environments without many of the skills that are traditionally valued in school contexts (Coleman, 1988; Crosnoe, 2004). Thus, positive relationships with teachers are a salient source of support for these students because through these relationships, students can develop the knowledge and skills needed to be successful in school (Croninger & Lee, 2001; Crosnoe, 2004). In fact, Meehan, Hughes, and Cavell (2003) reported that positive student–teacher relationships were more strongly associated with declines in aggression among minority students than among White students. However, research has found that students of color, in particular African American students, have less positive relationships with their teachers. Saft and Pianta (2001) reported that teachers of all races rated relationships with African American students as higher in conflict. Furthermore, African American students are more likely to receive office discipline referrals, over and above other risk factors (Bradshaw et al., 2010), and these discipline decisions are likely rooted in negative interaction patterns in the classroom (Weinstein, Gregory, & Strambler, 2004). Finally, there is growing consensus and evidence that these patterns of negative interactions and discrepant disciplinary practices, including suspensions and office discipline referrals, may explain, at least in part, the achievement gap between White and African American students (Gregory, Skiba, & Noguera, 2010).

Measurement of Student–Teacher Interactions

The interactions between students and teachers appear to be bidirectional, meaning that the manner in which a teacher interacts with a student (negatively or positively) impacts the way the student will respond in return and vice versa (Doumen et al., 2008). Therefore, developing tools that can detect and monitor student–teacher interactions can help to support interventions that directly focus on increasing positive teacher attention to students. In particular, a quick and easy observational assessment of teacher interactions with students would have great utility in identifying students needing additional supports, providing feedback to teachers about their interaction patterns which teacher may not notice themselves, and ultimately helping reduce the development of emotional and behavioral challenges. Rating scales and direct observation are two methods commonly used to measure teacher and student behavior in the classroom. Rating scales rely on student self-report and the report of others such as teachers and parents to draw conclusions about student behavior and the classroom practices of teachers. While these reports can be valuable to recognize the initial need for classroom interventions, they lack the sensitivity and specificity of more direct measures of teacher and student behavior (Yoder & Symons, 2010). Rating scales are not typically designed to be used as a repeated measure of student and teacher behavior, a feature that is necessary when implementing and monitoring the effectiveness of an intervention (Yoder & Symons, 2010). Direct Behavior Ratings (DBRs) are a more readily gathered form of teacher ratings which can be repeated and are sensitive to change over time (Chafouleas, Riley-Tillman, & Christ, 2009). Teachers rate each student on three dimensions (engagement, respect, and disruptive) using a 10-point,

low-to-high scale. Thus, DBRs provide an efficient and valid system for rating student classroom behaviors. However, both broad band rating scales and DBRs can be affected by bias. Direct observation holds the advantage of gathering data in context rather than relying on a retrospective account reducing bias and increasing the objectivity and accuracy of the assessment (Yoder & Symons, 2010).

A feasible brief observation assessment of student–teacher interactions could be utilized within schools using tiered models of support. Many schools have adopted multitiered prevention models to address the academic and behavior needs of students. The goal of these multitiered systems of support is to improve outcomes for all students through the use of evidence-based practices (Fuchs, Fuchs, & Stecker, 2010; Stormont, Reinke, Herman, & Lemke, 2012). A host of brief measures of indicators of academic risk have been developed and are readily administered to allow school personnel to identify students who may need additional academic supports before the issue becomes a serious problem. For instance, AIMSWeb (Howe & Shinn, 2002) and the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminski, 2002) are commonly used brief objective academic measures that can identify students who would benefit from Tier 2 or Tier 3 supports within a tiered model of intervention supports. Having similarly brief and easily administered measures to assess for important indicators of student risk of social behavior problems would improve the capacity of schools to streamline intervention efforts toward heading off negative student behavioral outcomes. Student–teacher interactions appear to be a robust indicator of student behavioral risk. Therefore, a brief direct observation assessment that can readily identify negative student–teacher interactions could be integrated into a tiered system of intervention support in schools to not only identify students at risk but also provide ongoing feedback that can be used to create intervention supports to mitigate this risk. For instance, schools could use the observation system universally, observing each student in a classroom for 5 min one or more times a year to identify patterns where teachers may be interacting less positively with some students than others. Another option would be to use the observation with students receiving office discipline referrals or who have been brought to the attention of a Tier 2 team in a school building. The observation could inform consultation efforts with the teacher about their use of positive and negative attention with the student, and serve as a progress monitoring tool to determine whether Tier 2 supports were effective.

Development of the Brief Student–Teacher Classroom Interaction Observation (ST-CIO)

The Brief ST-CIO (Reinke & Newcomer, 2010b) is a 5-min observation developed to quickly assess teacher interactions with students during classroom instruction. The measure was designed to gather teacher and student data simultaneously, including teacher use of reprimands, teacher use of praise, and student disruptive behavior. These data can then be reviewed to determine the pattern of interactions between teachers and individual students in the classroom, including the relation between positive and negative interactions and student disruptive behaviors. The ST-CIO was developed as a companion to the Brief Classroom Interaction Observation–Revised (BCIO-R; Reinke & Newcomer, 2010a), which is a 20-min classroom-level observation that simultaneously gathers data on teacher and student behaviors (see Reinke, Stormont, Herman, Wachsmuth, & Newcomer, 2015). While the BCIO-R is highly useful in providing performance feedback to teachers on their classroom management practices, student-level data are aggregated at the classroom level, reducing utility for identifying specific areas of need for individual students. Furthermore, given the knowledge that teacher feedback to students can be either positive (praise) or negative (reprimand), and that the amount of negative versus positive feedback a student receives is often related to student behavior (Jenkins, Floress, & Reinke, 2015), we developed the 5-min ST-CIO to allow us to gather student-level information that could then be used to inform whether a specific student in the classroom may benefit from additional supports. Suggestions for the most effective ratio of positive to negative teacher communication behaviors have ranged from 3:1 (Shores, Gunter, & Jack, 1993; Wong & Wong, 1998) to 5:1 (Sugai & Horner, 2005) with a general consensus that more positive feedback than negative is recommended. Furthermore, some recent evidence suggests that the amount of positive teacher interactions in relationship to negative relationships is related to student classroom behaviors. For instance, Pas, Cash, O'Brennan, Debnam, and Bradshaw (2015) found that observations of teachers in classrooms where students were well behaved used more positive recognition of student behavior and less reactive and fewer disapproving statements in comparison with teachers in classroom characterized as noncompliant. These teachers used more reactive and negative statements than positive. Thus, the ratio of positive to negative student–teacher interactions may be highly salient and useful information toward informing interventions. The ST-CIO was developed to allow a snapshot of the amount of praise versus reprimands a student receives from a teacher within a very short time frame (5 min), In addition, the ST-CIO simultaneously gathers data on student disruptive and aggressive behavior. Together, these data can provide important information about how the student behaves in the classroom and how the teacher interacts with that student with regard to the use of positive and negative feedback. When, within a brief window, a teacher provides more praise than reprimands, the interaction would be considered positive. Whereas, if a teacher provides more negative than positive feedback during this time, the interaction would be

considered more negative. Negative relationships between teachers and students are often associated with other negative outcomes such as poor academic performance and increases in aggressive or disruptive behavior (Fowler et al., 2008; Hamre & Pianta, 2001).

The reciprocal nature of teacher and student interactions and associated outcomes lends itself to considering interventions that target both teacher behavior and student behavior. For instance, if students are identified as having more negative than positive attention from their teacher directed to them, this information could be used in consultation with the teacher to develop a plan for increasing teacher attention to the behaviors they would like to see more from the student. Furthermore, a consultant can work with a teacher to identify the student behaviors that trigger the teacher to provide negative attention and work to prevent the trigger from occurring in the classroom. For instance, if a teacher spends a great deal of time redirecting or reprimanding a student for disrupting instruction, the student could be taught a new behavior (e.g., raising his or her hand and waiting to be called on by the teacher) and the teacher could provide positive attention each time the student displays the new behavior (Stormont et al., 2012).

Furthermore, teachers could increase their use of effective classroom management practices to reduce the likelihood of student misbehavior, leading to more positive interactions overall for students in the classroom. A brief 5-min observational measure of student–teacher interactions can inform the effectiveness of classroom practices. Effective teacher practices associated with positive effects on student behavior include establishing expectations that define appropriate classroom behavior (Rosenberg, 1986; Sprick, 2009), engaging students with high rates of OTR (Haydon, Mancil, & Van Loan, 2009; Sutherland, Alder, & Gunter, 2003), providing specific praise for desired behavior (Ferguson & Houghton, 1992; Reinke, Lewis-Palmer, & Merrell, 2008; Sutherland, Wehby, & Copeland, 2000), precorrection (Colvin, Sugai, & Patching, 1993; Stormont & Reinke, 2009), and explicit error correction following undesired behavior (McAllister, Stachowiak, Baer, & Conderman, 1969).

The purpose of this study was to evaluate the utility of the ST-CIO in elementary classrooms in predicting student social behavioral outcomes. If a brief measure such as the ST-CIO is able to predict changes over time in student behavior, then this measure would be targeting a valuable indicator of risk that can be used to develop plans to alter negative teacher and student interactions before becoming engrained. This study assessed the occurrence of teacher positive to negative attention among K to third-grade students using the ST-CIO and the association with end-of-year student social behavioral outcomes. In addition, analyses were conducted to determine whether student demographics were associated with teacher interaction with students. We hypothesized that students who received more negative attention than positive attention as measured during a brief 5-min observation in the fall of the school year would exhibit higher levels of disruptive behavior, emotional dysregulation, and problems with concentration at the end of the school year. In addition, we expected that students who received more positive attention than negative from teachers would exhibit higher levels of prosocial behavior at the end of the year. Finally, we predicted that boys, African American students, and students receiving free/reduced lunch would be more likely to receive more negative attention from teachers.

Method

The ST-CIO was utilized across K to Grade 3 classrooms in nine elementary schools in a low-income urban Midwestern school district. The teachers in these classrooms were part of a larger randomized trial evaluating the efficacy of a universal classroom management intervention. Therefore, for the purposes of this study, only observations of students in classrooms of teacher participants in the control condition were utilized. Participants in this study were 53 teachers and 896 students in kindergarten to third grade. Of the 53 teacher participants, 100% were female. Forty percent of teachers reported earning a bachelor's degree as their highest degree, 51% earned a master's degree, and 9% reported earning a post master's certificate. On average, teachers in the study had been teaching for 12 years. The racial demographics of the teachers were 23% African American, 76% White, and 1% listed themselves as Other. The percentage of teachers who taught each grade were 26% kindergarten, 28% first grade, 30% second grade, and 15% third grade. Seventy-three percent of the teachers were between the ages of 20 and 40, whereas 27% were above the age of 41.

Student participants were those whose parents consented for their participation in the larger randomized trial. Only consented students of control teachers were included in this study. Students were predominantly African American (75%), 51% were male, and 63% of the sample received free or reduced lunch. A total of 509 students (28%) were in kindergarten, 498 (27%) were in first grade, 449 (25%) were in second grade, and 361 (20%) were in third grade.

Measures

ST-CIO. Independent observers conducted direct observations of teacher and student behaviors using the Multi-Option Observation System for Experimental Studies (MOOSES; Tapp, 2004) interface for hand-held computers to gather real-time data using the Brief ST-CIO code (Reinke & Newcomer, 2010b). The frequency of teacher use of behavior-specific praise, general praise, explicit reprimands, and harsh reprimands directed toward the individual student was recorded. In addition, the frequency of

student disruptive behaviors of the observed individual student was obtained at the same time. Each student was observed for 5 min during academic instruction times (reading or math). For the purpose of this study, each student with consent to participate in the classroom was observed for 5 min. Often, two or more observers were in the classroom at the same time each observing different students, so that all students were observed for 5 min before observers left the classroom. One observation of each student was conducted in the fall of the school year (October) and again in the spring (April). All data were converted to rate per minute. To determine the amount of positive to negative interactions the individual student received from the classroom teacher, the total number of reprimands (explicit + harsh) was subtracted from the total number of praise statements (behavior specific + general). Thus, students receiving more positive than negative attention had a positive score on this variable, and those receiving more negative than positive attention had a negative score.

Teacher ratings of student behaviors. Teachers also rated student behaviors on the Teacher Observation of Classroom Adaptation–Checklist (TOCA-C; Koth, Bradshaw, & Leaf, 2009) in October and April of the academic year. The measure provides information on the teacher's perspective on student behavior, including prosocial behavior, disruptive behavior, concentration problems, and emotional regulation. The item responses ranged from 1 (*never*) to 6 (*almost always*). The TOCA-C is a reliable and valid measure. Previous research of the TOCA-C has found internal consistency estimates ranging from .86 to .96. For the current study, the internal consistency (computed using Cronbach's alphas) for each subscale ranged from .82 to .96. The subscales utilized in this study include Prosocial Behavior, Concentration Problems, Disruptive Behavior, and Emotional Dysregulation.

Student demographics. Student demographics were obtained from school district records.

Procedures

All study procedures were reviewed and approved by the researcher's institution and participating school district's institutional review boards (IRBs) prior to implementation. Teachers from nine elementary schools teaching in kindergarten, first, second, and third grades were eligible for participation in the study. These teachers were recruited for participation as part of a larger randomized control trial to evaluate the efficacy of a universal classroom management intervention in cohorts over 3 years. The authors met with eligible teachers to explain the study and outline data collection procedures. Interested teachers then provided informed consent to participate in the study (96% eligible consented). Next, parent consent forms were sent home to all students in the participating teachers' classrooms. Parents returned forms granting permission for their child to be observed. Eighty-three percent of parents consented to participation in the study. Students for whom consent was not received were not observed. All teachers were randomly assigned to receive classroom management training versus not. Only control classrooms were included in this study.

Analytic Plan

Reliability checks were conducted for observations across both time points. The MOOSES program calculates reliability for each variable by determining a match between observers within a 5-s window. If a match was found, then an agreement for that variable was tallied. Variables that were not matched were tallied as disagreements. An agreement ratio was then reported for each variable (agreements divided by the sum of agreements plus disagreements × 100%). The mean percentage agreement is reported as well as range of reliability for each variable.

Next, bivariate correlations among student–teacher interactions and student behavior were examined at each time point to examine how the variables were related to one another. Point-biserial correlations were conducted to evaluate the association between fall ST-CIO teacher positive to negative interactions and the binary demographic variable, student sex, race, and free and reduced lunch status. Finally, regression analyses using Mplus 7.11 were conducted to determine the relationship between ST-CIO teacher positive to negative interactions observed in the fall and observed disruptive behavior, and teacher reported student prosocial behavior, emotional dysregulation, concentration problems, and disruptive behavior in the spring. In all analyses, standard errors were corrected to reflect the fact that children were clustered within classrooms. Each regression analysis controlled for baseline levels of the outcome variable, student sex, race, age, and lunch status.

Results

Reliability Among Observers

Observers were trained for 2 weeks using videos and practice sessions in live classrooms to a criterion of 85% reliability with a master coder prior to conducting observations in study classrooms. Reliability checks were conducted for 29% of all observations in the field for fall and end-of-year observations. To determine reliability, two observers began the observation of an individual student at precisely the same time. One was considered the primary coder. The primary coder's data were used for the study. The secondary coder's data were used for reliability purposes only. The mean percent agreement on the ST-CIO was 88% for fall

and 93% for end-of-year observations. MOOSES utilizes a rigorous second-by-second comparison of raters to determine reliability, and an overall reliability of 80% is considered acceptable; thus, 88% and 93% are considered highly reliable (Tapp, 2004). In addition to overall reliability, averages for each teacher praise and reprimand and student disruptive behavior are provided. Fall reliability averages were 82% for behavior-specific praise, 80% for teacher general praise, 85% for explicit reprimands, 85% for harsh reprimands, and 85% for student disruptive behavior. Spring reliability averages on specific variables were 92% for behavior-specific praise, 83% for general praise, 89% for explicit reprimands, 97% for harsh reprimands, and 87% for student disruptive behavior. Therefore, all variables met or exceeded the 80% level of reliability at both time points.

Correlational Analyses

Correlational analyses were conducted between ST-CIO teacher interactions and all study variables. The point-biserial correlations between student race, sex, and lunch status were all significantly associated with teacher positive to negative interactions. For instance, student race and teacher positive to negative interactions in the fall were negatively correlated ($r = -.08$, $p < .001$), indicating that teacher provided more negative attention to African American students. Teachers also provided more negative attention to students who received free or reduced lunch ($r = -.06$, $p < .01$), and more positive attention to girls than boys ($r = .08$, $p < .001$).

In addition, the correlations between observations of teacher positive to negative interactions were significantly correlated with teacher report measures administered at the same time period. For instance, teacher report of prosocial behavior was positively correlated with teacher positive to negative interactions ($r = .14$, $p < .01$), indicating that students reported to be prosocial received more praise than students rated as less prosocial. All other teacher report measures were negatively correlated with teacher positive to negative interactions, including concentration problems ($r = -.07$, $p < .05$), emotion dysregulation s ($r = -.14$, $p < .001$), and disruptive behavior ($r = -.19$, $p < .01$). The results for the associations between ST-CIO teacher positive to negative interactions and study variables are provided in Table 1.

Regression Analyses: Fall Teacher Positive to Negative Interactions Predicting Spring Student Outcomes

Regression analyses were conducted to determine the association between teacher positive to negative interactions during the 5-min observations in the fall and student behaviors at the end of the school year controlling for baseline levels of student behaviors (see Table 2). Findings indicated that students observed to receive more positive attention than negative attention from the teacher in the fall were reported to have improved levels of prosocial behavior in the spring ($\beta = .12$, $p < .001$); that is, teacher positive attention rates predicted prosocial behavior outcomes even after controlling for baseline prosocial behavior ratings. Furthermore, students who received more negative attention than positive from the teacher were reported to have increased levels of concentration problems ($\beta = -.12$, $p < .05$) and emotional dysregulation ($\beta = -.07$, $p < .01$), and increases in observed disruptive behavior ($\beta = -.09$, $p < .05$) in the spring. In addition, girls were rated as having higher levels of prosocial behavior than boys ($\beta = .07$, $p < .01$); whereas boys and African American students were rated by teachers as having higher levels of concentration problems (sex: $\beta = -.24$, $p < .001$; race: $\beta = .11$, $p < .01$) and emotional dysregulation (sex: $\beta = -.09$, $p < .001$; race: $\beta = .07$, $p < .05$).

Discussion

The purpose of the study was to determine the utility of a brief 5-min observational measure of student–teacher interactions on predicting student social and behavioral outcomes. The findings suggest that the ST-CIO is a reliable and valid tool for assessing teacher and student classroom behaviors. Interrater agreement reached high levels across all rating domains, and each domain was correlated with related factors. Most notably, fall observations on the ST-CIO predicted meaningful end-of-year behavior outcomes over and above baseline ratings on these measures, suggesting that the measure is sensitive to the emergence of problems over time. This is especially important given how brief the observations (5 min) were of teachers interacting with students on a single occasion. The brevity of the measure for capturing meaningful information about teacher and student behaviors fits well with the need for efficiently collecting repeated measures over time.

Moreover, the ST-CIO appears to capture nuanced interactions between teachers and students that are consistent with conceptual and research-based explanations for how disruptive behavior problems emerge over time (Patterson et al., 1992; Reinke & Herman, 2002). The early social interaction foundations of antisocial behaviors that initiate behavior problems at home are often replicated in schools, whereby adults unwittingly selectively reinforce these behaviors. Here, we found that higher rates of teacher negative attention in the fall predicted increases in concentration, emotional dysregulation, and disruptive behavior problems at the end of the year, controlling for baseline scores on these measures. Likewise, positive teacher attention in the fall predicted improvements in student prosocial behavior from fall to spring. At a minimum, these findings indicate that the

Table 1. Intercorrelations Among Study Variables.

Variable *N* = 896	1	2	3	4	5	6	7	8	9	10
1. Positive to negative T1	—									
2. Prosocial T1	.14**	—								
3. Concentration problems T1	−.07*	−.48**	—							
4. Emotional regulation problems T1	−.14**	−.62**	.43**	—						
5. Teacher report disruptive behavior T1	−.19**	−.65**	.26**	.71**	—					
6. Observed disruptive behavior T1	−.56**	−.17**	.05	.20**	.25**	—				
7. Prosocial T2	.11**	.69**	−.27**	−.48**	−.62**	−.15**	—			
8. Concentration problems T2	−.13**	−.53**	.40**	.44**	.50**	.15**	−.71**	—		
9. Emotional regulation problems T2	−.12**	−.54**	.31**	.79**	.65**	.18**	−.66**	.63**	—	
10. Teacher report disruptive behavior T2	−.14**	−.51**	.24**	.73**	.73**	.21**	−.74**	.60**	.79**	—
11. Observed disruptive behavior T2	−.09**	−.13**	.09**	.17**	.17**	.08*	−.11**	.15**	.17**	.17**

Note. T1 = fall; T2 = spring.
*$p < .05$. **$p < .01$.

Table 2. Teacher Behavior Predicting Spring Student Outcomes Controlling for Baseline Variables, Student Sex, Race, Lunch Status, and Age.

Fall variables predicting spring outcomes	TOCA prosocial behavior *n* = 825		TOCA concentration problems *n* = 830		TOCA disruptive behavior *n* = 820		TOCA emotional regulation problems *n* = 825		Observed disruptive behavior *n* = 823	
	β	*SE*	β	*SE*	β	*SE*	β	*SE*	β	*SE*
Fall teacher positive to negative	.12***	0.03	−.13*	0.06	−.03	0.02	−.07**	0.03	−.09*	0.05
Baseline variable	.65***	0.03	.29**	0.03	.76***	0.03	.70***	0.03	.12*	0.05
Sex	.07**	0.03	−.24***	0.04	−.04	0.02	−.09***	0.03	−.03	0.04
Race	−.06	0.04	.12**	0.04	.004	0.03	.07*	0.03	.02	0.04
Lunch	.003	0.03	.07	0.04	.008	0.03	.002	0.03	.02	0.04
Age	.05	0.04	−.07	0.16	−.05	0.03	−.07**	0.03	.01	0.04

Note. Student sex: 0 = male, 1 = female; race: 0 = White and Other, 1 = Black; TOCA = Teacher Observation of Classroom Adaptation.
*$p < .05$. **$p < .01$. ***$p < .001$.

ST-CIO is useful for identifying students at risk for worsening behavior problems. They also suggest the ST-CIO may provide an early feedback tool for teachers to alter a malleable factor (positive to negative attention rates for desired behavior) that would lessen these students' risk.

The findings are especially promising for addressing the well-documented racial and ethnic disparities in special education placements and academic outcomes that have been the focus of many recent policy initiatives in the United States (National Research Council, 2002). The ST-CIO observations conducted in the fall found some support that these enduring disparities may have roots in the daily interactions between students and teachers. Even during these 5-min snapshots of interactions provided by the ST-CIO, we found that African American students and boys were more likely to receive more negative attention from teachers than other students. While the ST-CIO confirmed the hypotheses that student–teacher interactions differ between students based on demographic characteristics, the tool could also be used to inform teachers of these

interactions in efforts to change these patterns. Teachers aware of negative interaction patterns early in the school year can become more cognizant of how they interact with students in their classrooms. Furthermore, a critical next step in advancing our knowledge of teaching practices that can equitably support the learning of diverse students is determining the effectiveness of culturally responsive interventions. For instance, teacher professional development and coaching models like Double Check (Hershfeldt et al., 2009), which is an intervention to support culturally responsive teaching practices, can be implemented, and teachers could be observed to determine whether the new practices impact how teachers interact with students. Currently, quantitative measures of culturally responsive teaching are rare with most research exclusively relying on self-report, which is prone to socially desirable responses (Debnam, Pas, Bottiani, Cash, & Bradshaw, 2015).

The ST-CIO has promise for use as an observation tool by behavior consultants and coaches working with teachers who are struggling to manage the behaviors of targeted students in their classroom. The ST-CIO might help both to confirm the challenging behaviors and to gather information on teacher interaction patterns that may be related to these behaviors. Providing initial and ongoing performance feedback to teachers about these interaction patterns could help improve these conditions. Performance feedback has been used to increase the rates of teacher praise in the classroom, which in turn results in lower levels of student disruptive behavior (Mesa, Lewis-Palmer, & Reinke, 2005; Reinke, Lewis-Palmer, & Martin, 2007; Reinke et al., 2008). Although the ST-CIO was only administered on one occasion and further research will need to confirm its utility as a progress monitor tool, the present findings suggest that this would be a fruitful avenue for research and consultation.

The ST-CIO also has promise for use as a research tool for quickly gathering student- and teacher-level observation data and for assessing intervention effects. Rigorous evaluations of classroom processes and interventions require multi-informant and multimethods for measuring study constructs. Because of the time and expense required to collect these data, it is essential that each of these measures be time efficient. The ST-CIO's brevity makes it fit well for this need. Some other observation systems currently exist that are similar to the ST-CIO. For instance, one commonly used assessment, the *Classroom Assessment Scoring System* (CLASS; Pianta, La Paro, & Hamre, 2008), is an observational tool developed to assess classroom quality in prekindergarten through Grade 3 based on student–teacher interactions. The CLASS takes 30 min for observation and scoring, and is repeated up to 6 times over 3 hr in an effort to establish an accurate, complete picture of the classroom. Whereas the CLASS measures global constructs and takes up to 3 hr, the ST-CIO gathers the rate of specific behaviors in clearly defined contexts within a short time frame, allowing for specific data to be feasibly gathered and readily shared with teachers. Another observation tool similar to the ST-CIO is the *Assessing School Settings: Interactions of Students and Teachers* (ASSIST; Rusby, Crowley, Sprague, & Biglan, 2011). The ASSIST is a 15-min direct observational measure that evaluates social processes occurring in the classroom. The measure includes both event-based tallies and global ratings of teacher behaviors. The tallied behaviors include use of proactive behavioral management, opportunities to respond, approval, disapproval, and reactive behavior management. While both the CLASS and ASSIST are available and can be used to evaluate teaching practices in the classroom, only the ST-CIO allows for connecting this information to individual students.

Limitations

While the findings raise important questions about the relations between teacher and student behaviors and their sequence of influence over time, there are some limitations to the current study. Because teacher interactions were not directly manipulated in this sample of participants, causal inferences are not warranted. Furthermore, teacher positive to negative attention only captured the occurrence of this teacher interaction with a student without the students' reaction. However, the findings do imply a temporal sequence between observed teacher behaviors and subsequent student behaviors that is in line with major theories. Future research should investigate the reciprocal nature of the student–teacher interaction using the ST-CIO. Another limitation of the study is that the sample was obtained from a school district with a predominantly African American student population; therefore, the findings may not generalize to other schools with different student populations. Additional research is needed to replicate the findings with other samples of students. The findings are also limited to teachers interacting with students in kindergarten to third-grade classrooms, limiting the generalizability of the findings to secondary or upper elementary classrooms. Future research could be conducted with additional grade levels and with a larger sample to determine whether the ST-CIO has similar utility in these settings.

Other areas of future research for this measure include looking at the utility of the ST-CIO in identifying students in need of Tier 2 supports. It seems likely that teacher interactions with students would reveal students in need of additional supports. Future research could also investigate using the ST-CIO to progress monitor teacher interaction with students who may benefit from Tier 2 supports. Another area for future research is to examine whether the differential teacher interaction patterns found for African American students and boys are linked to later disciplinary and academic outcomes. Finally, additional research focused on

determining the optimal number of observations and varying the length of the observations is warranted.

Implications

Teacher interactions with students can have a profound impact on student development in both positive and negative directions (Hamre & Pianta, 2001; Meehan et al., 2003). Teachers interact with entire classrooms of students each year, and sometimes the subtleties of these interactions are the elements with the most enduring impact. It is unrealistic to expect teachers to be able to track these moment-to-moment patterns for all their students. However, the present findings suggest that meaningful elements that can predict student outcomes can be observed in even brief visits to the classroom. Capturing these elements with a tool like the ST-CIO and sharing this information with teachers may prove to be a useful strategy for helping ensure that teachers' interactions with students be more likely to facilitate development in positive directions.

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