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Assessing Teacher Use of Opportunities to Respond and Effective Classroom Management Strategies

Comparisons Among High- and Low-Risk Elementary Schools

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The importance of effective instruction on student academic and social achievement has been well documented. Strong classroom management and the use of high rates of opportunities to respond (OTR) have been two advocated classroom practices to positively impact student performance. This article presents an analysis of data collected across 35 general education classrooms in four elementary schools, assessing instructional variables associated with OTR. The relationship among OTR, measures of classroom management, and student work products was analyzed across Title and non-Title schools. Results indicate that teachers in the present study used components of OTR at rates similar to past research, but there were clear differences among Title I and non-Title schools. In addition, as teacher use of key instructional variables increased or decreased, other key variables posited as necessary by the literature often suffered. Implications for future research are discussed for students in high- and low-risk general education classrooms.

Keywords: *effective instruction; at-risk students; classroom management*

The importance of the link between effective instruction and student outcomes has been well documented. Simply stated, in an examination of variables affecting student achievement outcomes, Sanders and Horn (1998) indicated, "The single biggest factor affecting the academic growth of any population of youngsters is the effectiveness of the individual classroom" (p. 2). In an international review of student outcomes, Scheerens (1993) found that while schools in the United States accounted for only 9% of the variance among student outcomes compared to other nations, effective teachers accounted for more than 45% of the variance in student achievement. The reference to effective instruction is especially prominent with regard to the prevention of mild disabilities and support of those students currently receiving special education. For example, Lyon et al. (2001) reported that up to 70% of students who currently receive special education under the learning disabilities

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label may not have been labeled as such if effective reading instruction were in place with a strong emphasis on early intervention among at-risk students. In addition to effective instruction as prevention, effective differentiated instruction to meet the needs of diverse learners, including those with disabilities, is essential if schools are to meet annual achievement targets (Kauffman, Landrum, Mock, Sayeski, & Sayeski, 2005).

Two of the most consistently purported instructional practices for the classroom environment thought to positively impact the effects of instruction as measured by student outcomes are strong classroom management and an increase in the number of student opportunities to respond (OTR; Brophy & Good, 1986; Kern & Clemens, 2007; Sutherland, Adler, & Gunter, 2003; Sutherland, Wehby, & Yoder, 2002). Within this literature base, effective classroom management is defined as those general environmental and instructional variables that promote consistent classroom-wide procedures of setup, structure, expectations, and feedback. OTR is the functional combination of the interaction between the rates of teacher-based instructional talk (Roberson, Woolsey, Seabrooks, & Williams, 2004), prompts (Sutherland et al., 2003), feedback (Sutherland et al., 2002), and wait time (M. Rowe, 1974a, 1974b).

Instructional talk, or "active teaching," encompasses the presentation of academic information and the development of concepts through lecture and demonstration, coupled with elaboration in the form of discussions and practice examples (Brophy & Good, 1986). Good, Grouws, and Ebmeier (1983) conducted four experimental studies regarding teacher-led concept development in fourth-grade general education math classes and found that in the classrooms of effective teachers (i.e., those that had high rates of student achievement), on average, 50% of the allocated time was spent on demonstration and guided practice. Roberson et al. (2004) directly observed preservice special education teachers within kindergarten through eighth-grade classrooms who serve students with and without special needs and found that these teachers engaged in instructional talk 43% of the time. Wallace, Anderson, Bartholomay, and Hupp (2002) observed 96 inclusive classroom teachers in four geographically diverse high schools identified with exemplary learning results. On average, the observed teachers engaged in 40.22% academic talk. Thus, based on research, approximately half of instructional time spent in instructional talk might be considered optimal.

Prompts are defined as a specific directed request for action or response. Englert (1983) observed the teaching behaviors of 17 teacher trainees in practicum placements in elementary buildings (12 in resource rooms for children with learning disabilities, 5 in resource rooms for children with mental retardation). She found that effective teacher trainees gave more prompts per session, covered more content, maintained student accuracy at 85%, and had fewer instances of student inappropriate behaviors than the less effective trainees. On average, the more effective trainees provided 3.63 prompts per minute compared to 2.21 prompts per minute for the less effective trainees (Englert, 1983). Sutherland et al. (2003) examined the impact of increased OTR on the behavior of students with emotional and behavioral disorder (EBD; $n = 1$ girl, 8 boys). In their study, when the teacher increased the mean rate of prompts from a baseline of 1.24 per minute to 3.52 per minute, the student response accuracy increased from 71.8% to 75.5%, and on-task behavior increased from 55.2% to 82.6%. From the available research it is difficult to provide a clear metric to differentiate effective from ineffective classrooms (Englert, 1983; Sutherland et al., 2003), yet it appears that 3.5 prompts per minute during active instruction with students could serve as a "tipping point" at which increased student engagement and achievement are supported.

Although researchers have defined verbal praise in a myriad of different ways (Brophy, 1980; Cameron & Pierce, 1994; White 1975), verbal praise or encouragement is typically described as feedback that is intended to be reinforcing. Van Acker, Grant, and Henry (1996) found that students identified as at-risk for aggressive behavior received very low and random rates of praise with high rates of consistent reprimands. Brophy (1981) encouraged an emphasis on the quality of praising rather than on the frequency. Praise that is used infrequently, contingently, with specificity and credibility, and that remains in the range of a 3:1 or 4:1 ratio of praise to correction appears to be the most effective (Good & Grouws, 1977). Cameron and Pierce (1994) reviewed 96 experimental manipulations of praise that were published from 1971 to 1991 and concluded, like Brophy, that to be effective, praise had to be behavior contingent. Unfortunately, these authors offered no specific rate or ratio. Pfeffner, Rosen, and O'Leary (1985) determined that in a self-contained classroom of students with EBD, a mixture of positives to negatives in a 3:1 or 4:1 ratio was as effective as an enhanced, all-positive environment. The enhanced environment depended on an additional highly individualized program of reinforcers for each student and low rates of negative comments, a situation that teachers found very difficult to implement consistently. From this review of the literature on the efficacy and quality of teacher praise, it appears that an optimal ratio ranging from 3:1 to 4:1 of contingent, specific, and

credible praise and/or feedback to corrective statements improves student behavior and increases academic responding.

M. Rowe (1974a, 1974b) identified two distinct wait times within classrooms: Wait Time 1 (WT1), when the teacher pauses after prompting for a response, and Wait Time 2 (WT2), when the teacher waits if a student pauses during his or her answer. Without intervention, average wait time from kindergarten through college level for WT1 was 1 s (with no student response after 1 s the teacher typically repeats the question), and WT2 was slightly less than 1 s (0.9) before commenting on the response from the student (M. Rowe, 1974b). When an intervention to increase both WT1 and WT2 was implemented, student response length, "slow" student responding, student inferences, and student-to-student questions increased and failure to respond and the need for disciplinary "moves" decreased (M. Rowe, 1974b). Tobin (1983) conducted a study among 10- to 13-year-old students in an Australian science class and found that there was no correlation between the preintervention wait time of 0.5 s and achievement, but a positive correlation between the average postintervention wait time of 3.1 s and achievement. K. S. Rowe, Rowe, and Pollard (2004) found that for children with auditory processing difficulties, an intervention that included getting the child's attention, speaking slowly in short sentences, pausing (i.e., wait time), monitoring for understanding, and establishing hearing, listening, and compliance routines resulted in significant improvements in literacy levels. It appears, again based on a limited literature base, that increasing WT1 and WT2 can lead to student attentiveness, student responding, and student academic achievement, with a wait time (WT1) of 3 s or more being optimal (M. Rowe, 1974a; Tobin 1983).

Previous studies have noted correlations between the optimal delivery of OTR variables and positive gains in learning outcomes among typically developing students (e.g., Brophy & Good, 1986; Slavin, 1994) as well as students with mild disabilities (e.g., DePaepe, Shores, Jack, & Denny, 1996; Gunter, Hummel, & Conroy, 1998; Sutherland & Wehby 2001; Wehby, Symons, Canale, & Go, 1998). In a decade-long study, Greenwood, Delquadri, and Hall (1984) found that an increased rate of developmental mental retardation occurred in the absence of OTR in low-socioeconomic-status (SES) classrooms. OTR has also been associated with (a) an increase in student engagement with the topic, (b) a reduction in the likelihood of off-task behavior, and (c) the provision of multiple points to assess student mastery of skills (Brophy & Good, 1986; Bulgren & Carta, 1993; Cooper & Speece, 1990; Englert, 1983; Greenwood, 1991; Gunter, Coutinho, & Cade, 2002; Kamps, Leonard, Dugan, Boland, & Greenwood, 1991; Sindelar, Smith, Harriman, Hale, & Wilson, 1986; Sutherland et al., 2002; Sutherland et al., 2003).

A comprehensive review of the literature, including the previously cited works, provides the field with commonly employed definitions and suggested optimal rates for each variable when measured in isolation. However, previous studies have not provided in vivo rates of all four OTR variables together in real time, nor have they examined variations across school settings by risk. Previous studies also lack metrics from which the field can extend this literature base to assess the relationship between potential variations in classroom-based antecedents, such as the amount of classroom structure and management, as well as teacher and student demographics on the rate of OTR variables and measures of student outcomes.

For the purposes of the present study, the following research questions were posed: (a) What are the naturally occurring rates of instructional talk, prompts, feedback, and wait time (i.e., OTR) within 35 general education classrooms across four elementary schools? (b) What are the associations between SES, classroom management practices, and OTR variables? (c) What is the relationship between academic work products and socioeconomic status? and (d) What are the relationships among school characteristics and classroom management practices across the 35 classrooms and four schools?

Method

Setting

Four public elementary schools located in a mid-sized city in the Midwest were invited to participate. All four were currently implementing school-wide positive behavior support (SW-PBS) and had previously established research agreements with the authors' institution. Implementation of SW-PBS was operationally defined as evidence that the following six essential elements were being instituted as measured by the *School-Wide Evaluation Tool* (SET; Horner et al., 2004): (a) a statement of purpose, (b) clearly articulated school-wide behavioral expectations, (c) procedures for teaching the expectations, (d) a continuum of procedures for encouraging these expectations, (e) a continuum of procedures for discouraging problem behaviors, and (f) procedures for monitoring the impact of SW-PBS (Lewis & Sugai, 1999). Set scores for each of the schools met the 80% or above criteria, indicating they were implementing universal SW-PBS strategies (Horner et al., 2004). The

schools had received all SW-PBS professional development by the same university training team. Therefore, all four buildings' staff and students were accustomed to having researchers present in a variety of school environments, including classrooms, and in a variety of roles, including resource support (Klinger, Ahwee, Piloneta, & Menendez, 2003). This has been recognized as a factor regarding validity in research findings (Fox, Gunter, Davis, & Brall, 2000; Kazdin, 1982) whereby participants' behaviors are less likely to be altered by the presence of outside observers when their presence has become familiar.

The lead author met with each administrator and shared a letter of explanation of the study that teachers would be given. Any teacher interested in participating was asked to sign the letter, indicating willingness to participate and an understanding of the general parameters of the study. Each administrator was informed that the study would be descriptive in nature and designed to assess the interaction between common teaching practices and classroom management strategies during classroom instruction. It was also explained that although many of these variables had been well researched, little was known regarding appropriate metrics for these variables in combination and across student and teacher demographics. Additionally, each was provided a brief description of the nature of the classroom factors to be coded and were told the observations and data collection would occur during literacy activities, including gathering samples of students' work. Finally, permission was obtained to gather corresponding demographic measures related to students and teachers through archival review.

All four elementary schools agreed to participate across the 2-year timeframe. Two of the four schools were designated as low SES because of their classification as Title I eligible. Designation as a Title I building is based on the percentage of students qualifying for free or reduced-fee lunch status (a minimum of mid 30% range) and entitles that building to receive additional support and personnel related to literacy instruction.

Participants

During Year 1 and Year 2, administrators shared information regarding the study with all teaching staff in their buildings. For each school, at least one teacher, representing grade levels kindergarten through five, elected to participate. Specifically, teacher participation by grade level was as follows. Across Title I buildings, two kindergarten, two first-grade, three second-grade, four third-grade, two fourth-grade, and two fifth-grade teachers participated. Across non-Title buildings, three kindergarten, three first-grade, two second-grade, four third-grade, three fourth-grade, and five fifth-grade teachers participated.

Observations and data collection were completed at one building and partially completed at a second during Year 1. During Year 2, observations and data collection were completed for the second, third, and fourth buildings. All observations were completed across both years by the same research team. A total of 35 classroom teachers representing 723 students participated. No further information or any data were shared with participants until data collection was completed and analyzed for all buildings.

Demographics for the participating schools are presented in Table 1. Teacher demographic data included level of education, years of experience, and certification status. Student demographic data included SES, grade level, gender, and percentages participating in special or gifted education. Office discipline referrals (ODR) were reported by building principals as a total number for each student for the school year as computed using the *School-Wide Information System* (SWIS; Irvin, Tobin, Sprague, Sugai, & Vincent, 2004; Nakasato, 2000; Sugai, Sprague, Horner, & Walker, 2000). The SWIS system as used by these SW-PBS schools tracks ODR rates all year for each student. One-sample chi-square tests were calculated to determine whether differences existed among the four schools in terms of the number of teachers who participated and the total number of ODR for the year. Although differences did not exist among the schools in terms of the number of teachers who participated, significant differences did exist among the schools in terms of the number of total ODR for the year, $\chi^2(3) = 94.72$, $p < .001$. Overall, more ODR were found in Title I schools. Interestingly, one Title I (School 2) and one non-Title I (School 4) school reported the same number of ODR for the year. Nonetheless, when examining the average number of ODR per student for the school year, a pattern where the same children received more of the ODR was more prevalent for Title I schools than for non-Title I schools. However, and perhaps more important given the small number of schools, when analyzing ODR at the classroom level, an analysis of variance (ANOVA) indicated that ODR rates per classroom did not differ significantly according to Title I status, $F(1, 33) = .115$, *ns*.

Chi-square tests of independence were also calculated to determine whether the frequency of free or reduced-fee lunches, special education services, and gifted services offered to students varied across the four schools. The analyses indicated that the frequency of free and reduced-fee lunches varied by school, $\chi^2(3) = 181.12$, $p < .001$, with Title I schools providing more free and

Table 1
Characteristics of Students by School

Characteristics	School 1	School 2	Schools 1 & 2 Title Schools	School 3	School 4	Schools 3 & 4 Non-Title Schools
Classrooms	8	7	15	10	10	20
	(53.3)	(46.7)		(50.0)		(50.0)
Boys	70	78	148	122	104	226
	(47.3)	(52.7)		(54.0)	(46.0)	
Girls	71	60	131	114	104	218
	(54.2)	(45.8)		(52.3)	(47.7)	
Total children	141	138	279	236	208	444
	(50.5)	(49.5)		(53.2)	(46.8)	
Free/reduced-fee lunch	84	82	166	36	19	55
	(50.6)	(49.4)		(65.4)	(34.6)	
Special education	39	16	55	20	14	34
	(70.9)	(29.1)		(58.8)	(41.2)	
Gifted services	5	2	7	16	40	56
	(71.4)	(28.6)		(28.6)	(71.4)	
Total office referrals for the year	296	175	471	111	175	286
	(62.8)	(37.2)	(38.8)	(61.2)		
Mean office referrals per student for the year	2.1	1.27	1.69	.47	.84	.64

Note: Percentages appear in parentheses.

reduced-fee lunches than non-Title I schools. The frequency of special education services provided varied across the schools, $\chi^2(3) = 40.06$, $p < .001$, with School 1 (Title I school) providing the most special education services, followed by School 3 (non-Title I school). In addition, the frequency of gifted services varied across schools, $\chi^2(3) = 42.45$, $p < .001$, with non-Title I schools (Schools 3 and 4) providing more gifted student services than Title I schools (Schools 1 and 2).

Demographics demonstrating teacher characteristics are provided in Table 2. A chi-square test of independence indicated that education levels (i.e., bachelor's degree, master's degree, and master's degree with additional graduate hours) of teachers did not vary across schools. Three one-way ANOVAs indicated there were no significant differences among the schools in terms of the number of years teachers have been teaching, number of years teachers had been teaching in the current grade, and number of years teachers had been teaching at their respective school. Additionally, analyses showed that there were no significant differences reported among grade levels.

Procedures

A descriptive assessment of 35 classrooms was conducted across 5 hr of direct observation per classroom, for a total of 175 hours. One hour per day across five consecutive days were observed during the same teacher-identified literacy instruction period for each classroom. Additionally, each classroom was assessed twice (on Day 1 and Day 5) on overall classroom management (see the Level 1 description in the Assessment Protocol section). Finally, two sets of "reviewed and returned" literacy-related work products for each student within each participating classroom were collected. Each set of work samples included one example of an academic work product completed with teacher guidance (defined as teacher directed and supported) and one completed as independent practice. Each work sample was coded based on percent accuracy and whether feedback was provided on the returned work by the teacher to the students. These work products were used to later analyze our third research question regarding rates of teacher behavior and student outcomes. Teacher and student demographic data were also collected during the year each classroom participated in the study.

Assessment Protocol

The *Setting Factors Assessment Tool* (SFAT) was used as the primary assessment protocol in this study. The SFAT is a structural assessment tool that was developed from the ecobehavioral (Greenwood, Carta, Kamps, & Arreaga-Mayer, 1990; Logan, Bakeman, & Keefe, 1997)

Table 2
Characteristics of Teachers by School

Characteristics	School 1	School 2	Schools 1 & 2 Title Schools	School 3	School 4	Schools 3 & 4 Non-Title Schools
Years teaching						
M	6.75	15.00	10.60	14.95	13.20	14.08
(*SD*)	(5.95)	(10.87)	(9.30)	(8.83)	(7.77)	(8.14)
Range	2–20	3–33.5	2–33.5	1–25	3–24	1–24
Years teaching in current grade level						
M	5.25	7.14	6.13	8.40	9.00	8.70
(*SD*)	(5.47)	(7.36)	(6.25)	(6.31)	(5.93)	(5.97)
Range	1–18	2–23	1–23	1–23	3–24	1–24
Years teaching at respective school						
M	5.00	13.07	8.77	2.20	8.50	5.35
(*SD*)	(5.21)	(8.60)	(7.92)	(1.03)	(6.59)	(5.61)
Range	1–17	2–25	1–25	1–5	2–23	1–23

and structural analysis (Stichter, Hudson, & Sasso, 2005; Stichter, Lewis, Johnson, & Trussell, 2004) literature to help address ongoing limitations in assessing classroom-based antecedent variables on a larger scale (Stichter & Conroy, 2005). The SFAT includes multiple environmental and instructional antecedent variables that have consistently been identified as desirable in the effective teaching literature for typically developing and at-risk students, as well as students with mild disabilities. (Brophy & Good, 1986; Greenwood, Hart, Walker, & Risley, 1994; Sutherland et al., 2003). For a more complete description of the SFAT, see Stichter et al. (2004; complete coding manual available from the first author).

Although the full SFAT includes four levels of variables used in data collection, the specific variables identified for analysis in this study were derived from Levels 1 and 3 of the SFAT. A list of these variables can be found in Table 3. Specifically, Level 1 consists of common classroom-wide procedures (e.g., permission to use the bathroom, accessing teacher assistance, homework turn-in procedure), degree of structure (e.g., posted and clearly followed classroom rules and routines), and classroom setup (e.g., physical setup to allow for minimal interruptions to instruction and ease in accessing instructional materials). Level 1 consists of a paper-and-pencil checklist to assess overall classroom management. The 14 items are assessed using a direct-observation Likert scale format as well as through teacher interviews, and Day 1 (Time 1) and Day 5 (Time 2) observations. In addition, student work products are collected in Level 1. The previously described student work products are used to assess whether instruction is occurring according to the identified student phase of learning (i.e., independent practice level or teacher-directed stage during acquisition) based on student percent accuracy and the amount and type of teacher instructional feedback given on correct and incorrect performance. The Northwest Regional Educational Laboratory postulated that the levels of success that students demonstrate are highly related to subsequent achievement (Cotton, 1999). Accuracy criteria were set based on an extensive literature review of literacy and general instruction (Brophy & Good, 1986; Kushner & Stecker, 1987; Jones & Jones, 2001). Independent work is defined as work that is given to students that they are expected to be able to complete independently; the work should be geared toward a practice and fluency check. This rate is typically interpreted in the literature to mean that when practicing with independent work and materials, 90% to 95% accuracy should be obtained (Gersten, Carnine, & Williams, 1981; Rosenshine & Stevens, 1986). Therefore, 90% accuracy was set for independent work in the current study.

Teacher-guided instruction work is defined as introduction of new materials with a metric for success by providing students with a level of work at which they have an ability to minimally achieve 70% to 80% accuracy (Anderson, Evertson, & Brophy, 1979; Brophy, 1980). In this study, it was set at 70%. Percentages of student work not meeting criteria would, based on the operational definitions, indicate the percentage of students working at frustration level.

Student work products are collected at the same time the Level 1 checklist is completed. Although Level 1 checklists and these samples were gathered on Day 1 (Time 1) and Day 5 (Time 2), they should not be interpreted as pre

Table 3
Level One and Three Variables Assessed

Level	Category	Variables
Level 1:		
Environment	Student work displayed	Number of items
		Currentness
		Individual student work
		Group student work
		Feedback on work
	Classroom setup	Structural rating
		Traffic patterns
		Material preparation
		Rules posted and visible
		Daily routine posted and accessible
		Paraprofessional present
	Procedures	Filing work
		Assistance needed
		Answering questions
		Reentry
		Bathroom
		Homework
		Attendance
		Lunch choice
		Others mentioned by teacher
		Specific evaluation procedures
	Product levels	Student work, teacher assistance (70%–80% accuracy)
		Student work, independent (90%–95% accuracy)
		Feedback on all permanent product
Level 3:		
Instruction	Verbal	Instructional talk
		Noninstructional talk
		Content talk
		Preview
		Reference to prior knowledge
	Nonverbal	Wait time
		Down time
		Instructional model
		Student model/paraphrase
		Attention signal
		Circulation
	Prompting	Organizational prompt
		Positive specific prompt
		Positive unspecific prompt
		Negative specific prompt
		Negative unspecific prompt
	Feedback	Positive specific feedback
		Positive unspecific feedback
		Negative specific feedback
		Negative unspecificfeedback

and post measures. Instead, they simply serve as 2 separate days of data sampling, 5 days apart for consistency across classrooms, to represent an average for typical teacher and student behavior. Level 1 scores are assigned based on a developed rubric reflecting key elements resulting in a possible score of 0 to 81.

The Level 3 direct observation of teacher behavior consisted of the OTR variables instructional talk, prompts, wait time, and feedback. Level 3 variables were coded via direct observation using a real-time data collection system during classroom instruction. The Multiple Option Observation System for Experimental Studies (MOOSES) software program was employed on handheld computers (Tapp, Wehby, & Ellis, 1995). This multipoint data collection system was developed to facilitate collection and analysis of real-time observation data in classrooms allowing analyses of single behaviors as well as interactions and sequences of multiple behaviors. Handheld computers were used to enter the start and stop times for each occurrence of a target teacher or student behavior. This method of data collection allows the software to capture concurrent rates and duration of behaviors. Analysis of frequency, duration, and concurrence are then captured and can be plotted into a common graphing program.

Observational data collection procedures. There were two primary and three secondary data collectors involved throughout the project. Training for all five data collectors for the paper-and-pencil Level 1 assessments occurred using sample classrooms that were not part of the current study. Data collectors interviewed teachers and coded each room until all coders reached an interrater reliability criterion of 85% or higher. Training for all five data collectors was conducted using the MOOSES program on handheld computers in two stages: first, using videotapes of classroom instruction, and second, practicing on site in elementary classrooms that were not part of the present study (Roberson et al., 2004). Each data collector was trained until an interrater reliability criterion of 85% or higher agreement was met at both stages. There were 175 total classroom observations for kindergarten through fifth grade. Data for Level 3 were collected by direct observation for 5 days during literacy instruction sessions ranging from 45 to 60 min each with an average of 47.64 min per session. The 5 days of data collection for each teacher occurred either within one calendar week or across 5 consecutive school days.

Reliability measures were taken on 55% of the observations. Reliability was calculated through MOOSES

Table 4
Means and Standard Deviations of Instructional Variables

Instructional Talk *M* (*SD*)	Prompts *M* (*SD*)	Positive to Negative Feedback *M* (*SD*)	Wait Time *M* (*SD*)	Level 1 Scores *M* (*SD*)	Verbal Negatives *M* (*SD*)
0.69	2.61	4.57	2.92	64.14	39.83
0.17	0.66	3.00	2.70	9.18	61.76

software by adding the number of actual of agreements of the two observers divided by the agreements plus the number of actual disagreements for which they disagreed, then multiplying by 100 (Kazdin, 1982). Agreements and disagreements were calculated by frequency within set time interval windows (3 s) via MOOSES. Therefore, when both observers recorded the same behavior within the same 3-s window this was calculated as an agreement. Mean interrater reliability was high (Level 1, 97%, range = 93%–100%; Level 3, 93.2%, range = 74.4%–100%).

Results

Instructional Variables Data

Means and standard deviations for the instructional variables related to OTR are shown in Table 4. In general, means of the OTR variables for instructional period are similar to the mean or optimal values reported in the literature. In the current study, mean instructional talk (M = 69%) is slightly higher than the optimal 40% to 50% range reported in the literature. Mean prompts, at 2.61 per minute in this study, fall slightly below the optimal 3.5 prompts per minute suggested by the literature. The positive-to-negative-feedback ratio (M = 4.5:1) is close to the suggested 4:1 ratio. Finally, wait time (WT1) in the current study (M = 2.9 s) is very close to the recommended 3 s.

Comparison of Instructional Variables and Student Work Products Across Title Status

Correlations were calculated to examine the relationships among the variables of interest (see Table 5). Because Title I status is a dummy-coded variable, point-biserial correlations were calculated between Title I status and the remaining instructional variables and are subsequently noted as r_{pb} in the text. Pearson correlations were calculated between all of the remaining instructional variables and are subsequently denoted as r_p in the text. Relationships were noted between Title I status and Level 1 scores, $r_{pb}(33) = -.56$, $p < .01$, indicating that the two Title I schools tended to have lower Level 1 scores. In addition, the following patterns became noteworthy. As instructional talk increased, wait time per prompt decreased, $r(33) = -.38$, $p < .05$, and verbal negatives decreased, $r(33) = -.38$, $p < .05$. Instructional talk also was significantly related to Level 1 classroom and teacher scores, $r(33) = .35$, $p < .05$, indicating that classrooms with higher Level 1 scores tended to have higher instructional talk times. Variations also were noted by Title status. In particular, students in Title I schools in this study tended to exhibit more verbal negatives in the classroom, $r_{pb}(33) = .44$, $p < .01$, and received a smaller positive-to-negative-feedback ratio, $r_{pb}(33) = -.49$, $p < .01$, than their non-Title I school counterparts.

There was a significant, negative relationship between positive prompts and wait time per prompt, $r(33) = -.34$, $p < .05$, indicating that as positive prompts increased, wait time per prompt decreased. The positive-to-negative-feedback ratio was significantly and positively related to Level 1 classroom and teacher scores, $r(33) = .37$, $p < .05$, indicating that positive-to-negative-feedback ratios tended to be higher in classrooms with higher Level 1 scores. In addition, Level 1 scores were significantly and negatively related to verbal negatives, $r(33) = -.59$, $p < .01$, indicating that classrooms with higher Level 1 scores had lower incidences of verbal negatives.

Figures 1 and 2 display the mean percentages of independent and teacher-guided student work for each building that met the preset accuracy criteria. Buildings 1 and 2 are the buildings designated Title I. Two work samples of each type were collected for all students in each class observed on Day 1 (Time 1) and Day 5 (Time 2).

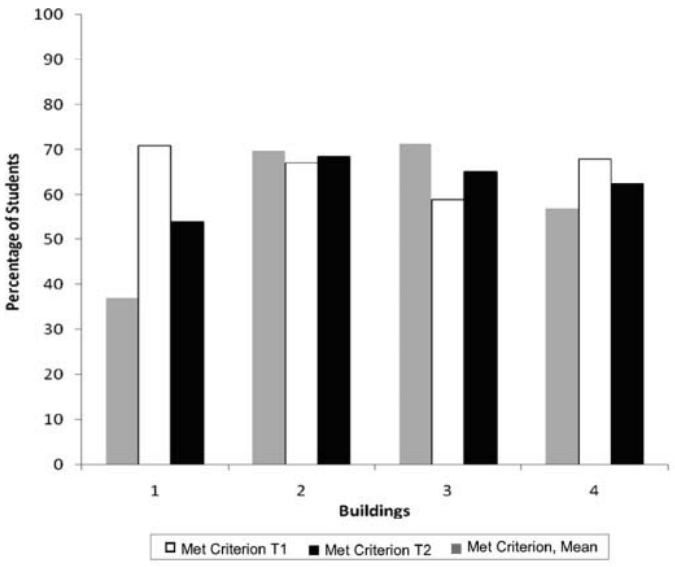
Data indicate that although differences occurred between work samples on Day 1 and Day 5 in most buildings, there existed little variance between Time 1 and Time 2, as well as across buildings, for mean (Time 1 and Time 2 combined) percentages. Buildings 2, 3, and 4 mean percentages of accuracy for independent work stayed within a 6% range of one another (68%, 65%, and 62%, respectively). Building 1 had the least amount of independent work samples that met the 90% accuracy criterion, with only 54% of students' combined work

Table 5
Intercorrelations Between Variables of Interest

Variables	1[a]	2[b]	3[b]	4[b]	5[b]	6[b]	7[b]
1. Title I status	–						
2. Instructional talk	–.18	–					
3. Prompts	–.01	.05	–				
4. Positive to negative feedback	–.49**	.28	.24	–			
5. Wait time	–.20	–.38*	–.34*	–.03	–		
6. Verbal negatives	.44**	–.38*	–.08	–.30	.11	–	
7. Level 1 scores	–.56**	.35*	.07	.37*	.15	–.59**	–

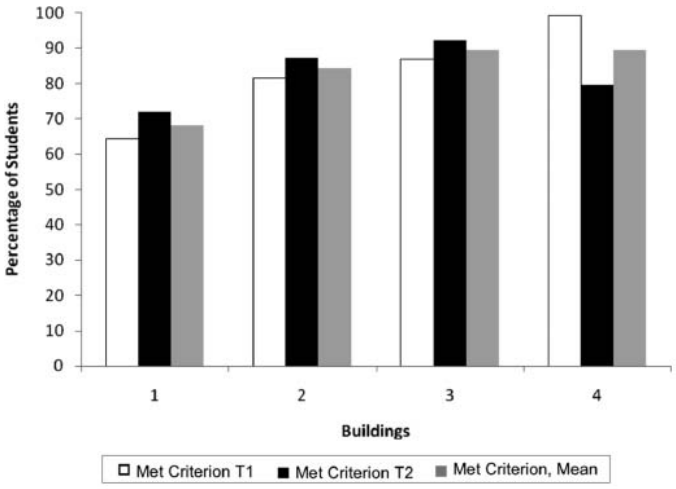
Note: Correlations are based on data from 33 of the 35 classrooms because of listwise deletion procedures for missing data.
a. Point-biserial correlations were calculated.
b. Pearson correlations were calculated.
*$p < .05$, two-tailed. **$p < .01$, two-tailed.

Figure 1
Percentage of Students Meeting 90% Accuracy Criterion for Independent Student Work



Note: T1 = Time 1; T2 = Time 2.

Figure 2
Percentage of Students Meeting 70% Accuracy Criterion for Teacher-Guided Work



Note: T1 = Time 1; T2 = Time 2.

samples meeting criteria. Building 1 also had the least amount of student work that was given written feedback and/or grades; therefore, the number of work samples from which the criterion percentage was derived was the smallest compared to any of the other buildings (57% for Building 1 compared to 65%, 100%, and 70% for Buildings 2, 3, and 4, respectively). Both non-Title I buildings (3 and 4) had 90% of student work with written feedback and/or grades at a 70% or higher accuracy for teacher-guided instruction work samples. Building 2 achieved 84% of students meeting accuracy criteria, and Building 1 had 68% of student work meeting criteria. Again, it should be noted that Building 1 also had the least amount of student work that was given written feedback and/or grades; therefore, the number of work samples from which the criterion percentage was derived for teacher-guided work was the smallest compared to any of the other buildings (50% for Building 1 compared to 70%, 87%, and 60% for Buildings 2, 3, and 4, respectively).

To investigate the relationships among school characteristics (Title I status) and classroom characteristics (Level 1, number of ODR per classroom), two multiple regression analyses were conducted (see Table 6). The

Table 6
Relationships Among School Characteristics and Classroom Characteristics

Variables Entered	*B*	*t*
Model 1: Predicting Level 1		
Title I status	–.51	–3.42*
ODR	–.10	–0.68
Model 2: Predicting ODR		
Title I status	–.01	–0.07
Level 1	–.14	–0.68
Model 3: Predicting verbal negatives		
Title I status	.05	0.26
Level 1	–.53	–3.08*

Note: Model 1: full model $R^2 = .280$; Model 2: full model $R^2 = .018$; Model 3: $R^2 = .308$. ODR = office discipline referrals.
*$p < .005$.

first model included ODR and title status as predictor variables and total Level 1 score as the dependent variable. Model 1 was significant, $F(2, 32) = 6.22$, $p < .01$. The full model explained 29% of the variance in Level 1 scores. Title I status was a significant predictor in the model; however, ODR was not significant. Model 2, which included Title I status and total Level 1 score as the predictors and ODR as the dependent variable, was not statistically significant, $F(2, 32) = .29$.

Given the correlational data, a third multiple regression was conducted to further explore whether Title I status and Level 1 score were significant predictors of student verbal negatives. The overall regression was significant, $F(2, 32) = 7.11$, $p < .01$. Level 1 score was a significant predictor of student negative verbal behavior, but Title I status was not a significant predictor in the model. The total model explained 31% of the variance in student negative verbal behavior.

Discussion

The purpose of this study was to examine the relationship of typical rates of classroom management procedures and instructional practices associated with students' OTR within four elementary schools. Additionally, we were interested in the impact of the practices on specific behavior and academic measures of student outcomes across elementary schools identified as Title I and non-Title I based on SES. To that end, the current study proposed and tested the following four questions.

The previous literature has suggested optimal rates for variables related to OTR (Roberson et al., 2004; M. Rowe, 1974a, 1974b; Sutherland et al., 2002; Sutherland et al., 2003). To further explore these suppositions, our first research question examined the naturally occurring rates of instructional talk, prompts, feedback, and wait time (commonly defined as OTR variables) within the participant pool. As demonstrated in Table 4, the data indicated that the natural rates of these OTR variables were consistent with previously reported rates in the literature. For each variable the mean rates were relatively close to optimal. Feedback and wait times were the two closest to desired levels. Unfortunately, the field is not yet able to identify the relevance of slight variations of optimal ranges; therefore, further interpretation of these natural rates would be premature.

Once the natural OTR rates were established, to address our second research question, a series of correlational analyses were performed to determine the associations among these rates, SES, and classroom management practices (Level 1 scores). Results indicated that instructional talk was significantly and positively related to Level 1 scores. In other words classrooms with higher Level 1 scores tended to have higher instructional talk times. In addition, analyses indicated that there was a significant, negative correlation between instructional talk and verbal negatives. Therefore, as instructional talk increased, inappropriate verbalizations from students decreased. Inappropriate verbalizations also showed a moderate, though significant, relationship between Title I status and the level of student verbal negatives, suggesting a tendency toward increased student problem behavior in the classrooms of the Title I schools. The large standard deviation for the verbal negatives should be considered when interpreting these data. Exploration of individual teacher data showed that one teacher in particular had a substantially higher rate of verbal negatives than any other teacher. It was also noted that this same teacher had notably poorer lower Level 1 scores as compared to her peers. It may be that this teacher's poorer overall classroom management and student work products contributed to the magnitude of the deviation of her students' verbal negative scores from those of students in other classrooms. Additionally, the significant, negative relationship between Level 1 scores and verbal negatives suggests that teachers who exhibit poorer classroom management have an increased amount of verbal outbursts and ongoing student disruptions.

Further correlations related to our second research question indicated that the associations among desired rates of instructional talk, positive-to-negative-feedback rates, and desired classroom management procedures (Level 1 scores) are consistent with and strengthen the literature. Of potential concern is an additional finding regarding the use of wait time. Analyses indicated a significant, negative relationship between instructional talk and wait time per prompt, as well as a significant, negative

relationship between positive prompts and wait time per prompt. As stated before, both instructional talk and positive prompt rates are linked to higher Level 1 scores. Implications are that as teachers engage in higher rates of instruction through content delivery and positive prompting, less time can be allotted for waiting on students to respond. However, a noteworthy amount of concurrent evidence across instruction and disability research indicates that appropriate processing time is essential for many students to effectively gain and optimize OTR (K. S. Rowe et al., 2004; M. Rowe, 1974a, 1974b; Tobin, 1983).

The third research question explored the relationship between academic work products and school characteristics. Differences in student work products were not remarkable in relation to Level 1 scores or Title status. This may have been, in part, an artifact of the percentage of low accuracy and feedback on student work across most buildings, a notable discrepancy with the literature on expectations in this area. This issue is discussed further in the Practical Implications section.

Finally, an analysis of the relation among SES (i.e., Title), ODR data, and classroom management practices (Level 1) was conducted to address our fourth research question. ODR rates were higher for Title versus non-Title schools, yet regression analysis indicated that office discipline rates were not predictive of effective classroom management. Instead, Title status was associated with classroom management; specifically, Title schools had significantly lower Level 1 scores. This result not only provided support for the potential validity of the SFAT to discriminate between variables, but on a practical level it also indicated that for Title schools in particular, the use of SW-PBS may need to be paired with classroom-wide Level 1 variables to affect student behavior as measured by metrics such as ODR. Further research will be needed to explore this possibility.

In summary, findings from the present study are consistent, or at minimum, in step with the majority of the published work in this area. The current study adds to the literature base indicating that evidence-based classroom management strategies play a significant role for effective instruction, and it adds support for more recent calls for increased use of classroom-wide universals within and across school buildings (Horner, Sugai, Todd, & Lewis-Palmer, 2005).

Practical Implications

On a practical level, a few key relationships stand out. The data indicated that more verbal negatives were coded in classrooms within buildings designated Title I as compared to their higher SES counterparts, which provided a logical presumption that the these same buildings would also report higher ODR. As stated previously, however, data did not support a correlation between ODR and effective classroom management. Although these findings certainly need to be replicated, this does imply that other factors affect the occurrence of verbal disruption and subsequent office referrals. Yet the current study found that despite this discrepancy in general student behavior across Title I and non-Title I buildings, overall student work product data did not share this distinction between the types of schools. Given that there were no significant relationships across teacher demographics and all four buildings had a similar history of working as research sites, a closer examination regarding the pivotal variables for student outcomes is warranted, particularly with respect to the role and types of (i.e., written vs. oral) feedback on student work.

One distinction that was noted during data collection between and across buildings was the role of feedback to students on written work products. Before the data were shared with the faculty of each school, the faculty were asked their perspectives of the accuracy a child should exhibit on independent practice versus teacher-guided work. One Title building in particular articulated a building-wide "philosophy" that discouraged written feedback on work products and encouraged scheduled oral feedback between teachers and students. As a result, this school had the lowest amount of written feedback to students, and it indicated that feedback was not given regularly but on a more "qualitative" schedule.

Also noteworthy was that across all four buildings, a significant portion of the teachers indicated they believed students should have a higher degree of accuracy during teacher-guided work products than during independent seatwork. This was, of course, directly inverse of the previously cited research on acquisition and fluency benchmarks for accuracy (Brophy & Good, 1986; Gersten et al., 1981; Jones & Jones, 2001; Kushner & Stecker, 1987; Rosenshine & Stevens, 1986) and may be indicative of how teachers are using these contexts for assessments of understanding. From an applied perspective, standards and training are desirable to assist enhanced coordination and support for teachers and buildings where, on average, students achieved only 68% accuracy on teacher-guided work and mid-60% correct for independent work. Additionally, administrators can look at potential correlations between low accuracy rates on independent seatwork that is ideally designed for practice and increased rates of challenging behavior and special needs referrals. Implications in the domain of work product are significant from both practical and research perspectives. To our knowledge, this is the first

study to compare written feedback and percentage of accuracy on both independent and teacher-guided work on such a large sample concurrently with classroom management and instructional practices. Further research is necessary to fully understand whether the sizable discrepancy in teacher and school use of feedback on written work and expectations of accuracy is representative nationally.

Limitations

The results of this study should be viewed within the scope of its design limitations. The current study is a descriptive study that provides only correlational findings. All of the 35 classrooms observed across the four schools were employing SW-PBS practices. Because all four schools were previously oriented to and had been practicing SW-PBS to fidelity, an artificial level of homogeneity of school-based practices may have resulted that would not be replicated across other schools. Specifically, this might be the case with regard to how and how much ODR data were collected, as well as student feedback data provided. It is unclear the degree to which these factors may have affected the mean results. In addition, all of the participating schools were limited to one Midwestern school district. Representation of schools located in both rural and urban centers would enhance the picture of school and teacher practice in classrooms that represent the potential influence of diversity in student population size, ethnicity, and culture. The present study focuses on teacher behavior and provides only general measures of student behavior without breaking out typically developing from at-risk students and students with disabilities. As a result, for example, a few students in a school or classroom could account for significant proportions of ODR and verbal negative behaviors. The potential for these factors were not controlled within this descriptive study. Replications in classrooms across varied demographic areas of the United States and schools not implementing SW-PBS, and specifically examination of teacher instructional patterns directed to students with disabilities, are clearly warranted.

Conclusion

The present study has added to an understanding of potential benchmarks for practices, often reported as effective in the literature, that comprise student OTR (Brophy & Good, 1986). The study also provides additional replications of previous research (DePaepe et al., 1996; Gunter et al., 1998; Sutherland & Wehby, 2001; Wehby et al., 1998) while extending the current literature base by examining concurrent rates and patterns of instructional practices and how teachers combine instructional practices within specific educational contexts.

With respect to improving general education environments to allow all students to succeed, especially those at risk and with disabilities, Kauffman et al. (2005) posited that "any reasonable policy [toward mainstreaming] must take into consideration the difference of both instruction and standards for students with varying abilities and needs" (p. 3). Any practice of inclusion needs to identify what levels of instructional practices are occurring in those settings to best differentiate for whom and under what conditions these practices are effective. Facilitating collaboration between special and general educators along with the respective training programs without a baseline of common expected metrics from which to discuss differentiated instruction seems a moot point. To this end, additional and expanded research on the desirable core levels of instructional practices is needed.

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