Examination of the Relationship Between Teacher Praise and Opportunities for Students with EBD to Respond to Academic Requests

KEVIN S. SUTHERLAND, JOSEPH H. WEHBY, AND PAUL J. YODER

Providing students with opportunities to respond to academic requests (OTR) and praise have been identified as effective teaching practices. Because academic difficulty is a primary characteristic of students with emotional and behavioral disorders (EBD), receiving adequate OTR and praise are crucial for ameliorating their academic deficits. Although a relationship between rates of OTR and teacher praise has been suggested, the nature of this relationship is largely unknown. The purpose of this article was to investigate this relationship through an examination of the significance and magnitude of the relation between teacher praise and OTR in classrooms for students with EBD using time-window sequential analysis. Results suggested that (a) a summary-level relationship represented by a significant positive correlation and (b) a significant sequential association existed between teacher praise and OTR. Implications for future research and study limitations are discussed.

STUDENTS WITH EMOTIONAL AND BEhavioral disorders (EBD) exhibit both academic and behavioral deficits that offer profound challenges to their teachers (Kauffman, 2001; Walker, Colvin, & Ramsey, 1995). The academic difficulties of students with EBD (Ruhl & Berlinghoff, 1992) often lead to failure in school and later life (Meadows, Neel, Scott, & Parker, 1994). Students with EBD also often display social skills deficits, which may include peer relationship problems, aggression, and oppositionality (Gresham, Lane, MacMillan, & Bocian, 1999; Kauffman, 2001; Walker et al., 1995). As a result of some combination of academic and behavioral problems, students with EBD have classroom problems, such as disruptive and off-task behaviors, that affect not only their social and academic development but also the behavior of others in the classroom, including the teacher (Gunter, Denny, Jack, Shores, & Nelson, 1993; Gunter et al., 1994). For example, it has been demonstrated that teachers' instruction is more limited and characterized by easier tasks for children exhibiting problem behaviors than for children who do not exhibit such behaviors (Carr, Taylor, & Robinson, 1991; Wehby, Symons, Canale, & Go, 1998). In fact, a cycle of negative reinforcement has been used to characterize teacher–student instructional interactions in classrooms for students with EBD (Gunter et al., 1993; Gunter et al., 1994); that is, the disruptive behaviors of students with EBD are negatively reinforced by the removal of academic task demands, and teachers are negatively reinforced by the removal of the disruptive behaviors. This cycle may help explain the reported lack of effective teaching practices in classrooms for students with EBD (Sutherland & Wehby, 2001a; Wehby et al., 1998). The academic deficits of these students thus may be exacerbated by the lack of effective academic instruction they receive, which in turn is due in part to their disruptive classroom behavior.

Recently, there has been a resurgence in the number of researchers advocating for the use of effective teaching practices to not only ameliorate the academic difficulties of students with EBD but also to decrease levels of disruptive and aggressive behavior (e.g., Deno, 1998; Gunter & Denny, 1998). A relationship between academic difficulty and problem behavior, although complex, does appear to exist (Talbott & Coe, 1997). If rates of effective instruction are increased, the expectation would be that academic achieve-

ment would improve and rates of problem behavior decrease. Two critical components of effective instruction are the rate at which students are given the opportunity to actively respond to academic requests (OTR) and the number of praise statements students receive for appropriate academic and social behavior.

Increasing the rate at which students were given opportunities to respond resulted in improved academic performance in reading (Carnine, 1976; C. H. Skinner & Shapiro, 1989; C. H. Skinner, Smith, & McLean, 1994) and math (C. H. Skinner, Ford, & Yunker, 1991; C. H. Skinner, Belfiore, Mace, Williams-Wilson, & Johns, 1997). In addition, positive effects were also noted for task engagement (Carnine) and decreased disruptive behavior (West & Sloane, 1986). Similar results have been obtained in studies of teacher praise (Sutherland, 2000). Increases in teacher praise had positive effects on reading achievement (Gable & Shores, 1980) and math achievement (Luiselli & Downing, 1980). In addition, increases in teacher praise resulted in more desirable classroom behavior such as increased task engagement (Sutherland, Wehby, & Copeland, 2000) and fewer disruptions (Gunter et al., 1993).

Although these studies provided some evidence that both increased rates of OTR and teacher praise have positive effects on the academic outcomes and classroom behavior of students with EBD, descriptive research has suggested that teachers of students with EBD use these practices infrequently. Van Acker, Grant, and Henry (1996) found rates of OTR of .025 and .020 per min for students identified as at mid-risk and high-risk for the development of aggression. In this same investigation, rates of teacher praise ranged from 1.4 per hour (mid-risk) to 1.2 per hour (high risk). Wehby, Symons, and Shores (1995) used direct observation of teacher and student behaviors in 14 classrooms for students with EBD. Students received rates of OTR ranging from .156 to .163 per minute and rates of praise from 1.6 to 2.8 per hour. Finally, in classrooms for students with EBD, Shores et al. (1993) found rates of teacher praise as low as 1 per hour.

Evidence Suggesting a Relationship Between OTR and Teacher Praise

Although OTR and teacher praise might be viewed as independent components of the broader construct of effective instruction, a relationship between these two variables has been suggested (Gunter et al., 1993). Indirect evidence from previous research has supported this assertion. For example, the per minute rates reported in Van Acker et al. (1996) for OTR (.025) and teacher praise (.024) for students at mid-risk for aggressive behavior and for OTR (.019) and teacher praise (.020) for the high-risk group are strikingly similar. Moreover, the literature on teachers' use of effective practices has provided further evidence. In a study by Cantrell, Stenner, and Katzenmeyer (1977), teachers identified as positive contingency managers had higher rates of both OTR and praise than teachers identified as traditional authoritarian or traditional nonauthoritarian. Espin and Yell (1994) reported that preservice teachers rated as most effective had the highest rates of OTR and praise.

If a predictable relationship between teacher praise and OTR does exist, it would have implications for interventions designed to increase their occurrence: It may be possible to effect both by increasing one. Interventions may then serve as catalysts for not only increasing teacher praise and helping to establish positive reinforcement contingencies but also for increasing OTR in classrooms for students with EBD.

Summary

Although intervention research has demonstrated the positive effects of both teacher praise and increased OTR on the academic outcomes and classroom behavior of students with EBD, descriptive research has suggested that teachers in these classrooms use these practices infrequently. A relationship between effective teaching practices—in this case, teacher praise and OTR—would hold promise for interventionists attempting to increase teachers' use of these effective practices. To date, however, this phenomenon has not been examined directly. Thus, the purpose of this article is to examine the significance and magnitude of the relationship between teacher praise and OTR in classrooms for students with EBD. The behavioral sequence of interest is the strength of association between teacher praise and OTR within the ongoing stream of classroom instruction. We hypothesized that an OTR is likely to follow a teacher praise statement within 5 s at a rate greater than chance occurrence. This hypothesis was based upon the transactional nature of social interactions (Sameroff, 1983; 1995): Transactions occur when an individual (teacher) is influenced by the behavior of another individual (student) to do something that he or she might not otherwise have done. Research has suggested that the majority of teacher praise statements in classrooms for students with EBD are nonbehavior-specific in nature and typically occur in response to the correct academic responses of students (Sutherland & Wehby, 2001a; Van Acker et al., 1996), which directly follow an OTR. Therefore, we hypothesized that when teachers are reinforced by the correct responding of students, they will provide praise for the correct response and then provide another OTR within 5 s.

Method

Setting

The settings for this study were 20 self-contained classrooms (Grades K–8) for students with EBD. The mean number of students per classroom was 10.8 (SD = 2.8), and all classrooms had a full-time paraprofessional who assisted the teacher. Students were typically referred to these classrooms because of behavior and learning problems exhibited in their general education classrooms or resource rooms (see Note).

Participants

We recruited teachers of students with EBD through informational mailings, telephone contact, and workshop presen-

tations. Twenty teachers (Grades K–8) from the same school district in a large city located in the southeastern United States volunteered to participate in the investigation. There were 9 African American (8 women, 1 man) and 11 Caucasian (9 women, 2 men) teachers in the sample. The mean age was 39.6 years (SD = 8.2), and 16 teachers held graduate degrees. The mean number of years of teaching experience was 12.9 (SD = 8.5), whereas the mean number of years of teaching students with EBD was 8.3 (SD = 7.2). Teachers were provided a monetary stipend for their participation.

There were 216 students in the 20 participating classrooms. According to Individualized Education Program (IEP) records, 112 of these students were identified as having emotional disturbance (ED), 48 were identified as having a learning disability (LD), 20 were identified as having mental retardation (MR), and 36 were otherwise categorized. Thirty-three students were girls and 183 were boys (M = 10.1 years, SD = 2.6, range = 5–15 years).

Design

We used a correlational design to measure the magnitude of the relationship between teacher praise and OTR using Pearson's r. In order to examine the sequential association between these two teacher behaviors, sequential analysis using time windows was also conducted. *Sequential analysis* refers to statistical techniques used for analyzing sequences of behavior (Yoder & Feurer, 2000). *Time-window sequential analysis* determines whether a target behavior occurs within a specific time from the onset of the antecedent behavior more than one would expect by chance (Bakeman & Quera, 1995). Figure 1 illustrates an example interaction between a teacher and a student, with the corresponding observational codes.

Procedures and Data Collection

Prior to beginning the study, each teacher gave the research team three times of day that explicit, teacher-led academic instruction occurred daily; one of these times was selected for daily direct observation. Observations were conducted during the first 15 min of regularly scheduled academic instruction. Both whole-class and small-group instruction were observed, and subject areas observed included math, reading, language arts, science, and social studies.

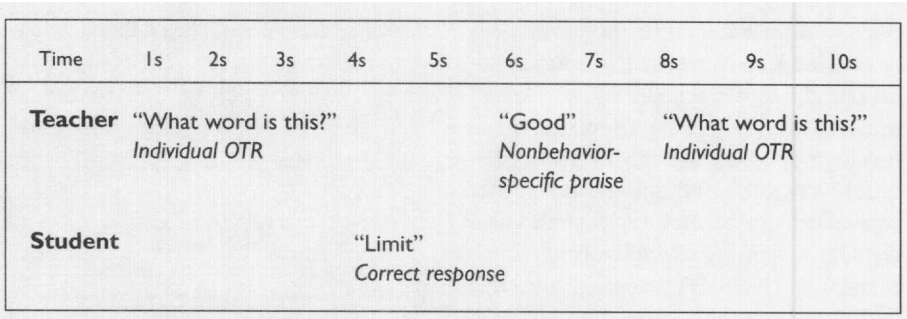

FIGURE 1. Example of an instructional interaction between a teacher and a student. *Note.* OTR = opportunities to respond.

Two hours of observation were allotted for each participating teacher. Observations were conducted across 10, 15-min sessions, each completed on a separate day. A minimum of 90 min of observation time per teacher was conducted. Recording of teacher and student behavior was completed using the Multiple Option Observation System for Experimental Studies (MOOSES: Tapp, Wehby, & Ellis, 1995) and NEC MobilePro™ 770 handheld computers. MOOSES is a computer-based observation system that allows for simultaneous collection of both discrete events and general durational measures along a real-time continuum.

Observer Training. Two master's-level individuals, both with experience in teaching students with EBD, were employed as data collectors. After memorizing the behavioral codes and becoming familiar with the data collection system, the observers were trained for approximately 6 weeks using videotaped samples of instruction. In situ training was then conducted in two high school classrooms for students with EBD; this training occurred for approximately 4 weeks. During videotaped sessions, data collectors' scores were compared with a master file for each videotape, and observers were required to obtain at least 80% agreement across codes for three consecutive sessions before beginning live practice observations; this procedure was repeated during the live observations before observers were allowed to begin actual data collection.

Observations were completed using the following procedures. The observer entered the classroom at the agreed-upon time and began data collection when academic instruction began. If academic instruction was ongoing when the observer arrived, the observer began data collection immediately. The observer sat in the same location of the classroom during each observation. Interobserver agreement estimates were obtained by having a second observer simultaneously but independently collect data using the same procedures. Agreement estimates were obtained during training and over the course of the study by using the procedures outlined by MacLean, Tapp, and Johnson (1985). Event frequency agreement was computed using a 5-s window around each event file in the primary observer's file. If a match was found in the second observer's file, an agreement was scored. All unmatched codes were considered to be disagreements.

Direct Observation Dependent Variables. Nine teacher behaviors and one student behavior were coded in this investigation. In the MOOSES program, a two-digit numeral represented each of these mutually exclusive codes. Table 1 describes the behavioral codes. All data were pooled across sessions and analyzed using per minute rates (see Table 2). The categories of other teacher behaviors (reprimands, academic talk, and other talk) and correct student responses were included in

the descriptive and correlational analysis to provide a context for the reader. In addition, the three categories of teacher praise (academic behavior specific, social behavior specific, and nonbehavior specific) were collapsed into a total teacher praise category; total reprimands (i.e., academic reprimands and social reprimands) and total OTR (i.e., group OTR and individual OTR) also represent collapsed categories. These data were collapsed because we were primarily interested in each behavior as a class and less interested in their topography as it related to our hypothesis and the research questions. In addition, collapsing of codes across topographies of teacher praise and opportunities to respond allowed us to have a sufficient sample of these behaviors in order to interpret the results from the sequential analysis (see Yoder & Feurer, 2000, for a discussion of this issue).

Results

Interobserver Agreement

Interobserver agreement was assessed during 22% of the sessions (32 of 147 sessions). Percentage scores were calculated by dividing total agreements by agreements plus disagreements and multiplying by 100. The interobserver agreement estimate across all variables was 82.6% (range = 68.3%–92.4%; see Table 3). The overall mean kappa (per session) for all dependent variables was 0.79 (range = 0.60–0.95, $SD = 0.08$).

Correlations Among Dependent Variables

As noted above, per minute rates of the dependent variables are presented in Table 2. Results of the correlational analysis are presented in Table 4. Significant positive correlations were found between total praise and the dependent variables of OTR ($r = .56, p < .01$) and students' correct responses ($r = .49, p < .05$). Negative correlations were noted for the variable other talk and the dependent variables academic talk ($r = -.66, p < .01$), OTR ($r = -.58,$

Table 1
Direct Observation Codes and Descriptions

Behavior	Definition
Teacher	
Behavior-specific teacher praise (statements for student academic behavior)	Verbal comments indicating approval of students' academic behavior that specify the behavior.
Behavior-specific teacher praise (statements for student social behavior)	Verbal comments indicating approval of students' social behavior that specify the behavior.
Nonbehavior-specific teacher praise statements	Verbal comments indicating approval of students' behavior that do not specify the behavior.
Teacher reprimand statements for academic behavior	Verbal comments indicating disapproval of students' academic behavior.
Teacher reprimand statements for social behavior	Verbal comments indicating disapproval of students' social behavior.
Group opportunities to respond orally or publicly (on the chalkboard or overhead projector) to academic requests	A question or statement by the teacher that seeks a response to an academic request.
Individual students' opportunities to respond orally or publicly (on the chalkboard or overhead projector) to academic requests	A question, statement, or gesture (point, nod) by the teacher that seeks the response of an individual student by name to an academic request (unless the teacher is working one-to-one, then the name in the statement is not necessary).
Academic statement	Verbal statement by the teacher that pertains to the lesson at hand. May clarify or explain concept being taught or be examples of concepts being taught; may also be acknowledgement that is not praise.
Other	All other verbal behaviors performed by the teacher.
Student	
Correct response	A response that correctly answers the teacher's academic request or statement. A response to an open-ended inquiry that is on the topic and does not meet with disapproval from the teacher also is considered a correct response.

$p < .01$), and students' correct responses ($r = -.57$, $p < .01$). In addition, positive correlations were found between students' correct responses and the dependent variables of OTR ($r = .94$, $p < .01$) and academic talk ($r = .46$, $p < .05$).

Sequential Analysis

Yule's Q was used as the index of sequential association. Yule's Q indicates whether the sequential association of interest—in this case, teacher praise and OTR—is larger or smaller than an estimate of the sequence's chance occurrence (Yoder & Feurer, 2000). The value of Yule's Q ranges from −1.0 to 1.0, with 0 representing the null relationship between the two behaviors. Thus, a negative value suggests that the target behavior occurs after the given behavior less often than is estimated by chance, and a positive value suggests that the target behavior occurs after the given behavior at a rate that is greater than chance occurrence. These analyses indicated that OTR were likely to occur within 5 s of a teacher praise statement at a frequency greater than would be expected by chance (Yule's Q, $M = 0.46$, $SD = 0.51$), and the mean value of Yule's Q was significantly different from 0, $t(19) = 3.995$, $p < .001$. The large standard deviation is in part due to the fact that 2 of the 20 teachers had no instances of praise and OTR occurring within a 5 s time lag, which resulted in a −1.00 value of Yule's Q for both teachers (see Table 5). Eighteen of the 20 teachers had a value of Yule's Q ranging from 0.39 to 0.80 ($M = 0.62$, $SD = 0.12$). Table 5 also includes the corresponding Allison-Liker z score for each teacher. Bakeman, Robinson, and Quera (1996) have empirically shown that z scores over 2.50 can be considered different from a random shuffling of events and chance sampling of behavior, which in this case happen to represent unusually large numbers of OTR within 5 seconds following praise.

Discussion

The purpose of this article was to examine the significance and magnitude of the nonsequential and sequential relationships between teacher praise and OTR in classrooms for student with EBD. Results suggested that (a) a summary-level relationship represented by a significant positive correlation and (b) a significant sequential association exist between teacher praise and OTR.

Data collected in this investigation focused on teacher-directed behavior toward a group of students, whereas previous descriptive work in this area (e.g., Shores et al., 1993; Wehby et al., 1995) focused on teacher behavior directed toward an individual student. Base rates of teacher praise and OTR in this investigation, when divided by the number of students in the classroom, approximated those reported in previous investigations. Moreover, the results of the correlational analysis begin to provide some insight

TABLE 2
Per Minute Rates for Dependent Variables

Dependent variable	*M*	*SD*
Total praise	0.646	0.477
Total OTR	1.566	1.003
Total reprimands	0.399	0.223
Academic talk	3.974	1.655
Other talk	2.272	1.333
Students' correct responses	0.977	0.717

Note. OTR = opportunities to respond.

TABLE 3
Interobserver Agreement for Teacher–Student Behavior Observations

Dependent variable	Agreements	Disagreements	% agreement
Teacher behavior			
Academic-specific praise	23	6	79.3
Social-specific praise	49	4	92.4
Nonbehavior-specific praise	268	41	86.7
Academic reprimand	44	12	78.6
Social reprimand	126	24	84.0
Individual OTR	311	69	81.8
Group OTR	485	100	82.9
Academic statement	1,985	417	82.6
Other statement	789	143	84.7
Student behavior			
Correct response	418	131	68.3

Note. OTR = opportunities to respond.

TABLE 4
Correlations Among Dependent Variables

Dependent variable	1	2	3	4	5	6
1. Total praise	—	.56**	.42	.22	.00	.49*
2. Total OTR	—	—	.37	.41	−.58**	.94**
3. Total reprimands	—	—	—	−.08	−.09	.33
4. Academic talk	—	—	—	—	−.66**	.46*
5. Other talk	—	—	—	—	—	−.57**
6. Students' correct responses	—	—	—	—	—	—

Note. OTR = opportunities to respond.
*$p < .05$. **$p < .01$.

TABLE 5
Yule's *Q* and Allison-Liker *z* Scores for Each Teacher

Teacher	Yule's Q	z
1	0.71	7.07
2	0.54	4.37
3	0.69	9.25
4	0.74	6.46
5	0.71	12.05
6	0.59	6.42
7	0.70	8.94
8	−1.00	−0.20
9	0.71	5.92
10	0.46	1.72
11	0.62	7.70
12	0.57	3.76
13	−1.00	−0.23
14	0.39	1.62
15	0.63	6.45
16	0.44	1.32
17	0.80	11.33
18	0.72	11.17
19	0.61	10.28
20	0.48	4.69

into the relationship among teaching behaviors in classrooms for students with EBD. Negative correlations between the variables of other talk and OTR and between other talk and academic talk suggest that other talk is not compatible with teacher behaviors that may promote student academic success. Namely, these results indicate that teachers who spent more time using off-topic statements in the classroom used less explanatory statements about the lesson at hand and provided fewer OTR for their students. This assertion is supported by both the negative correlation between other talk and students' correct responses and the positive correlations between students' correct responses and OTR, academic talk, and praise. Taken in sum, these results suggest that teachers who used lower rates of other talk and higher rates of OTR, academic talk, and praise promoted higher rates of students' correct responses.

Research has suggested that increased rates of OTR result in higher rates of task engagement by students (Sutherland & Wehby, 2001b); therefore, it may be expected that in classrooms with high rates of other talk, students will have higher rates of off-task behavior. If this was the case, it was not reflected by the correlation between other talk and reprimands from this investigation ($r = .09$, *ns*). It is plausible that students in classrooms with high rates of other talk may in fact have high rates of off-task behavior, but teachers are choosing not to reprimand this behavior. It has been suggested that some teachers may avoid interacting with some students in order to minimize escalation of problem behavior (Wehby et al., 1998). Regardless, the lack of direct observation data on students' behavior limits our ability to interpret this phenomenon.

Meanwhile, the significant correlation between praise and OTR suggests that teachers with high rates of praise have high rates of OTR and teachers with low rates of praise have low rates of OTR. This relationship has implications for the school success of students with EBD, as both teaching behaviors have been shown to have positive effects on students' academic and behavioral outcomes. Furthermore, given that most teacher praise in classrooms for students with EBD is nonbehavior specific and in response to the correct academic behavior of students (Sutherland & Wehby, 2001a), these two teaching behaviors may be powerfully connected.

We hypothesized that an OTR was likely to occur within 5 s of a teacher praise statement based upon data collected in classrooms for students with EBD and the transactional nature of social interchanges. Results from this investigation have provided some support for this hypothesis and have added further support to research suggesting teacher behavior may be affected by students' behavior (Carr et al., 1991; Wehby et al., 1998). The strength of the reinforcement received by the teachers for their students' correct responses appeared to be represented by the teacher providing praise to the student(s). The consequence of the correct response–teacher praise sequence thus was OTR at rates greater than expected by chance; namely, the teachers would provide more OTR so teachers would have more opportunities to be reinforced by students' correct responses. The strength of the se-

quential association between praise and OTR, although not necessarily indicative of a causal relationship, is consistent with this instructional cycle in classrooms for students with EBD.

B. F. Skinner (1974) noted, "The way one person treats another is determined by reciprocal action" (p. 211). Therefore, given the reciprocal interactions, positive or negative, between teachers and students in classrooms, reduced aversive behavior by the students should lead to reduced escape, avoidance, and counter-control behaviors from the teacher (Gunter et al., 1993). Furthermore, because behavior is determined in part by past contingencies (B. F. Skinner), through a manipulation of contingencies it may be possible to positively affect the social and academic interactions between teachers and students with EBD. Gunter et al. (1993) recommended effective teaching practices, such as providing adequate OTR and giving students enough information to respond correctly, to combat negative reinforcement in classrooms for students with EBD. In addition, they suggested that these effective teaching practices will lead to increased rates of correct responses, giving teachers more opportunities to praise. However, although effective teaching practices that lead to students' correct academic responses should be a goal of all teachers and researchers, interventions that target these practices may not be powerful enough to effect contingencies already present in classrooms for students with EBD. Evidence exists that suggests that correct academic responding and compliance on the part of students in classrooms for students with EBD do not predict teacher praise (Shores et al., 1993; Van Acker et al., 1996); thus, increasing students' correct responses and compliance may not affect rates of teacher praise. On the other hand, the strength of the sequential association between teacher praise and OTR that was found in the present investigation suggests that it may be possible to affect the rate of OTR through an increase in teacher praise. The strength of the sequential association does not imply causality, however, and experimental manipulations are necessary to determine if increases in teacher praise result in increased rates of OTR. Sutherland and Wehby (2001a) found increased rates of OTR when teachers increased their rates of praise, but these increases were not statistically significant. The authors also noted an increased rate of Type II error in their investigation due to the small sample of teachers, which may have limited their ability to find a significant effect. Future investigations using samples large enough to discern how rates of effective teaching practices may be manipulated experimentally are needed.

Limitations

Several limitations of the present investigation should be considered when interpreting the results. First, the teachers in the sample volunteered for this research, which means that teachers who were the most confident in their ability may have been more likely to participate, limiting the generalizability of the results. In addition, although the interobserver agreement estimates for most of the dependent variables were acceptable, the definition of the variable of students' correct responses may have been too broad for observers to reliably code occurrences. For example, this definition did not discriminate between individual or group correct responses; thus, if an OTR was provided to a class and several students called out with the correct response, many opportunities for disagreement were created. Regardless of the reason for the low interobserver agreement for students' correct responses, the reader must interpret the results—including rates of students' correct responses—carefully.

Future Research

Results from this study and its limitations indicate several other areas in need of future research. More research is needed that examines the interactions between teachers and students with EBD during academic instruction. Given the academic and behavioral problems presented by these students, teachers face unique challenges in attempting to remediate multiple deficits. The correlational analysis presented in this article creates some intriguing possibilities for future research. For example, large sample sizes would allow investigators to create groups of teachers based upon base rates of particular teaching behaviors and correlations among particular teaching behaviors. Analyses on student outcomes, such as achievement measures and classroom behavior, then would provide important information regarding the effect of categories of teaching behavior ("more effective" versus "less effective"); investigations such as these in classrooms for students with EBD are urgently needed, as results would both inform teacher practice and preservice and in-service training.

The strength of the sequential association between teacher praise and OTR holds promise for researchers designing interventions to increase rates of teacher praise and OTR in classrooms for students with EBD: An increase in one effective practice as a result of intervention may include a concomitant increase in the other effective practice, with the result being better academic instruction for students with EBD. At the same time, given the strength of this sequential association, interventions that target both OTR and praise may be particularly powerful at improving teacher–student interactions in classrooms for students with EBD. Furthermore, because research has suggested that increased student compliance does not predict teacher praise (Shores et al., 1993; Van Acker et al., 1996), it may be necessary to target both practices to affect teacher behavior sufficiently in order to create significant student outcomes. Last, time-window sequential analysis appears to be a powerful methodological tool for researchers examining interaction patterns between teachers and students. As instructional interactions occur within ongoing streams, the flexibility of this methodology would seem very helpful in answering many unique and important research questions. Previous research in classrooms for students with EBD has utilized lag sequential analysis (e.g., Nelson & Roberts, 2000; Wehby et al., 1995), which examines the extent to which a target behavior occurs within a specified number of coded behaviors from the an-

tecedent behavior (Bakeman & Gottman, 1997). Time-window sequential analysis may provide a more useful tool for researchers interested primarily in the temporal relationship between antecedent and target events, as interceding events in a lag sequential analysis (at various lag steps) may cloud interpretation of the data. Furthermore, unlike lag sequential analysis, the accuracy of time-window sequential analysis is not affected by decisions regarding which nonantecedent and nontarget events to include in the coding system (Yoder, Short-Myerson, & Tapp, in press). Clearly, the research question should guide one's choice of analytic tool.

Conclusions

Results from this investigation suggest both a summary-level relationship and a sequential association between teacher praise and OTR in classrooms for students with EBD. At the same time, more research is clearly needed on several fronts. Although we are learning more about the nature of teacher–student interactions in these classrooms through descriptive research, intervention studies that examine teaching practices and utilize multiple measures of student behavior are critical to helping us understand how best to address the multiple challenges presented by educating students with EBD. Furthermore, the lack of empirical data on effective academic practices for students with EBD is discouraging (Gunter & Denny, 1998; Ruhl & Berlinghoff, 1992) and must be addressed. Sound research in these areas may provide teachers with more, and better, tools to successfully educate students with EBD.

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Note

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