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Abstract

The purpose of this study was to investigate the effectiveness of a teacher-implemented tier two behavior intervention and differential effects based on function of student problem behavior. The participants were 36 public elementary school students who were nominated for additional behavior support beyond universal School-wide Positive Behavior Support. The intervention provided was Check-In/Check-Out, a tier two intervention using direct behavior ratings to increase structure and feedback to the student's environment. Before and after implementation of the intervention, the authors assessed the students' function of behavior, levels of problem behavior, prosocial behavior, and rate of behavioral incidents. A multivariate analysis of variance indicated significant effects for all students in prosocial behavior and behavioral incidents, but not problem behavior. An analysis of interaction effects indicated statistically significant differences in response to intervention based on function of problem behavior. Results are discussed in terms of considering function of problem behavior in selecting tier two interventions and implementing a three tier response to intervention model.

The 2004 reauthorization of the Individuals with Disabilities Education Act (IDEIA, 2004) allows educational agencies to utilize a Response to Intervention (RTI) model for identifying students under the category of specific learning disability. In contrast to previous models of special education eligibility that relied on results of standardized measures of cognition and academic achievement, RTI relies on the continuous monitoring of student progress while providing multiple tiers of prevention and intervention. Although the majority of research and scholarly discussion has focused on utilizing RTI models for academic concerns, several researchers have proposed a similar model for social behavior problems (Eber, Sugai, Smith, & Scott, 2002; Fairbanks, Sugai, Gardino, & Lathrop, 2007; Gresham, 1991; Sugai, Horner et al., 2000). In the field, over five thousand schools across North America are implementing a three tier RTI model to support student social behavior (Horner, Sugai, Todd, & Lewis-Palmer, 2005).

Although the specific components of RTI vary by implementation context, the RTI process generally includes the following: a) screening all students to identify who may benefit from additional support, b) implementing evidence-based interventions, c) providing a continuum of intervention through multiple tiers of intensity (i.e., primary, secondary, and tertiary), d) continuously monitoring all student progress, and e) examining student progress data to make special education eligibility decisions (Fuchs, Mock, Morgan, & Young, 2003; Gresham, VanDerHeyden, & Witt, 2005).

RTI is commonly implemented through a three tier model of support (e.g., H. M. Walker et al., 1996). Three tier models provide a proactive continuum of support, in place for all students in a school (O'Shaughnessy, Lane, Gresham, & Beebe-Frankenberger, 2003; Simmons et al., 2002; Sugai, Horner, & Gresham, 2002; Vaughn, Linan-Thompson, & Hickman, 2003). Three tier RTI models focus not only on the remediation of academic and behavioral problems, but also on prevention. Thus, a continuum of behavior support ranges from universal strategies to prevent the occurrence of problems for all students in the school, to highly structured, individualized interventions for students who display severe skill deficits. Walker and colleagues advanced a three tier continuum of behavior support based on an established public health model delineating primary, secondary, and tertiary prevention (Simeonsson, 1994). Following this logic, school personnel implement a proactive, universal system for all students. This tier one (primary prevention) system is intended to provide adequate support for 80 to 85% of the school population. A tier two (secondary prevention) system is put in place to support students who are at risk for developing more serious problem behaviors, and do not respond to the universal system alone. This is typically successful for 10 to 15% of the school population. Finally, a highly individualized tier three (tertiary prevention) system is implemented for students who display the most serious problem behavior, and do not respond to either tier one or tier two interventions. This is typically needed for 3 to 5% of the student population. Decision rules to move students up and down tiers is based on need for support, which is determined by continuous monitoring of student progress. Students will continue to move up the tiers until an intervention is effective. If the student requires a resource intensive program that includes specially-designed instruction (i.e., tier three), s/he may qualify for special education services.

An example of an evidence-based three tier RTI model for social behavior is School-wide Positive Behavior Support (SWPBS; Colvin, Kame'enui, & Sugai, 1993; Horner et al., 2005; Sugai, Horner et al., 2000). The SWPBS approach involves selecting and implementing evidence-based interventions at each tier and using school-wide and individual data to provide and improve support for students. Fairbanks and colleagues (2007) examined a SWPBS three tier RTI approach in an elementary school. School personnel implemented a tier one school-wide and classroom management intervention (universal SWPBS) for all students, and identified students who did not respond to the universal intervention through office discipline referrals and teacher referral. These students were provided with a tier two, Check-In/Check-Out direct behavior rating intervention (Crone, Horner, & Hawken, 2003; Filter et al., 2007; Hawken, McLeod, & Rawlings, 2007). Students at tier two were monitored through daily points earned and direct observation. Those who did not respond to the tier two intervention were then provided with a tier three intervention, individualized function-based support (Crone & Horner, 2003).

Tier Two Interventions

Within the three tier RTI model, tier two interventions have received less research scrutiny than tier one or three interventions. This level of support is intended for students who need more support than the universal system but may not require an intensive individualized intervention. Tier two interventions share a number of critical features. Typically these are ongoing programs for students that have a moderate number of students receiving services at a given time. The support is provided similarly for all students—this makes the interventions cost-effective and efficient for individual school personnel to implement (March & Horner, 2002). To be efficient in delivery, these interventions should be readily available for referred students, require little assessment prior to implementation, require few additional resources, and take no more than 10 minutes per day of classroom teacher time (Crone et al., 2003). In addition, the intervention must be cost effective, so that it can support multiple students with few resources. Examples of tier two behavior interventions include direct behavior rating intervention systems (such as Check-In/Check-Out), social skills training, anger management programs, and homework clubs (Hawken & Horner, 2003).

Current Concerns Regarding Tier Two Interventions

A tier two intervention represents a precarious balance between the other tiers. For tier one, the question is simple: is the student responding to an evidence-based, fully implemented universal intervention? If the answer is no, the student moves up the tiers. For tier three, it is also relatively straightforward—is the student responding to the individualized intervention? If the answer is no, additional assessment and modification of the plan may be indicated. Because tier two lies between these tiers, the question is more complex. The initial question of response to intervention is the same, but if the answer is no, there exists a further question: is the lack of response due to an insufficient intensity of intervention (i.e., the student requires a tier three intervention) or a poor match to the student's needs (i.e., the student requires a different tier two intervention)? Answering this question incorrectly could lead to an improper special education eligibility decision or the delay of needed intensive services (Fuchs et al., 2003).

Several pressing concerns about the three tier model have not been addressed in the current research literature. For example, it is unknown whether tier two interventions should be modified to the individual student's needs before moving up to the tier three level of support. Modifications could provide students with efficient support in the least restrictive environment, but adding an additional step to RTI may also stall the provision of needed services. In addition, it is unknown whether just one tier two intervention is sufficient for the entire school, or if multiple options are necessary.

One particularly important dimension of behavior to consider in this debate is function of problem behavior (McIntosh, Horner, Chard, Dickey, & Braun, in press). Decades of research supports the use of functional behavior assessment as an intervention planning tool for students exhibiting problem behavior (Carr, Horner et al., 1999; Lane, Umbreit, & Beebe-Frankenberger, 1999; McIntosh & Brown, 2007). In particular, research has shown that interventions that do not address the function of problem behavior are unlikely to be successful in reducing moderate to severe problem behavior (Carter & Horner, 2007, in press; Filter & Horner, in press; Ingram, Lewis-Palmer, & Sugai, 2005; March & Horner, 2002; Newcomer & Lewis, 2004). Therefore, a key consideration when assessing an RTI model of behavior support is whether the function of problem behavior moderates the response to tier two interventions.

Some recent studies have examined the effect of function on two commonly used tier two behavior interventions. Carter and Horner (Carter & Horner, 2007, in press) completed studies examining the effectiveness of adding function-based support to First Step to Success (H. M. Walker et al., 1998), a standardized tier two intervention designed to provide adult attention and group rewards for appropriate behavior. Carter and Horner modified the intervention for students whose behavior was not maintained by adult attention. Their results provide evidence that adding function-based support to tier two interventions improves student response to intervention.

March and Horner (2002) provided initial descriptive evidence that response to a Check-In/Check-Out intervention was moderated by function of problem behavior. The authors implemented Check-In/Check-Out for 24 students in grades 6 to 8 and monitored the number of office discipline referrals received. Functional behavior assessment interviews indicated that 69% of students whose behavior was maintained by adult or peer attention had decreases in rates of referrals, and only 27% of students with escape-maintained behavior had such decreases. These results are descriptive and indirect only, but provide an indication of differential responses to Check-In/Check-Out based on function. All three of these studies provide some preliminary evidence that function may play a key role in response to tier two interventions, and schools may need to provide multiple tier two interventions or adapt existing interventions to address function.

Purpose of the Present Study

The present study was designed to address these concerns. We assessed the effectiveness of a commonly used tier two intervention by assessing levels of behavioral functioning before and eight weeks after implementation. In addition, we completed interviews at the outset of the intervention to identify function of problem behavior and examine its role in treatment effects. Specifically, we addressed the following two research questions: 1) is there a relationship between implementation of a Check-In/Check-Out intervention and changes in ratings of problem

behavior, ratings of prosocial behavior, and behavioral incidents (main effects), and 2) is there an interaction between function of problem behavior and changes in these outcome variables (interaction effects)? In other words, to what extent did all students respond to the intervention, and to what extent was the response moderated by function of problem behavior?

Method

Setting

The setting for the study was six public elementary schools in a school district in the Pacific Northwest region of the US. In the year the study took place (2005-06 school year), total district K-12 enrollment was 5,410 students. The district's ethnic composition was 3% African American, 3% Asian American/Pacific Islander, 78% European American, 14% Latino/a, and 3% Native American/Native Alaskan. The percentage of schools in the district qualifying for Title I services was 88%, with the percentage of children receiving free or reduced lunch at 53%, (ranging from 32% to 73%).

The district has an ongoing, 12 year SWPBS initiative, and all schools participating in the study had a tier one SWPBS system in place at above 80% mean implementation, measured by the School-wide Evaluation Tool, a fidelity of implementation measure with evidence of sufficient validity and reliability (Horner et al., 2004). The district also has an ongoing intensive student systems initiative, designed to support students with severe behavior challenges (Lewis-Palmer, Bounds, & Sugai, 2004). Each school also met criteria for an adequate and durable system for addressing behavior challenges at tiers two and three as measured by the Individual Student Systems Evaluation Tool (Lewis-Palmer, Todd, Horner, Sugai, & Sampson, 2003). In addition, five of the six participating schools had an existing Check-In/Check-Out intervention in place at the time of the study.

Participants

Participants in the study were students who were nominated by their classroom teachers for the Check-In/Check-Out based on their levels of problem behavior and perceived need for support beyond the tier one intervention (universal SWPBS). Initially, 40 students participated in the study, but some students had identified functions that were rare in this sample, including escape social interaction ($n = 2$), obtain tangible item ($n = 1$), and multiple functions ($n = 3$). Due to the inherent dangers of using a small sample to assess group differences, these six students were not included in the analyses, bringing the final n down to 34. This final group included students whose functions were identified as obtain adult/peer attention ($n = 18$) or escape academic task ($n = 16$). Participants were enrolled in grades 1 to 5 (mean: 2.78) and ranged in age from 6 to 11. There were 28 males and 6 females. The ethnic backgrounds of the students were as follows: 3% African American, 88% European American, 6% Latino/a, and 3% Native American/Native Alaskan, indicating a slight overrepresentation of European American and underrepresentation of Latino/a students.

Measures

Function of problem behavior. For the purposes of this study, the function of problem behavior was assessed through the *Functional Assessment Checklist—Teachers and Staff (FACTS)*; March et al., 2000). The *FACTS* is a teacher/staff semi-structured interview form that is used to identify a problem behavior and determine the function of problem behavior. There is moderate validity and reliability information supporting the use of teacher interviews in general (Beaver & Busse, 2000; Carr, Langdon, & Yarbrough, 1999), and the *FACTS* itself has been shown to possess evidence of sufficient validity, reliability, and treatment utility (Borgmeier, 2003; McIntosh, Borgmeier et al., in press). The outcomes of the *FACTS* include a description of the primary problem behavior, identification of antecedents and consequences of problem behavior, and an identified function maintaining problem behavior, such as obtaining adult or peer attention, tangible items/activities, or sensory stimulation, or escaping academic tasks, social interactions, or sensory stimulation.

Problem behavior ratings. Levels of behavior were measured through the *Behavior Assessment Scale for Children 2 (BASC-2)*; Reynolds & Kamphaus, 2004). The *BASC-2* is a standardized, norm referenced behavior rating scale for assessing levels of problem behavior in school-aged students. The *BASC-2* was selected because of its recent

revision, psychometric properties, and its updated, representative normative group. The measure also contains four validity indices to control for biased responding. The form used in this study was the *BASC-2 Teacher Report Scale – Child Form*, designed to rate the behavior of students aged 6 to 11. Composite scales for the *BASC-2* are reported as T-scores, with a mean of 50 and a standard deviation of 10. To measure level of problem behavior, the authors used the Behavioral Symptoms Index (BSI), a composite scale consisting of the following subscales: hyperactivity, aggression, depression, attention problems, atypicality, and withdrawal. The *BASC-2* test manual reports the following technical adequacy means for this composite scale: alpha reliability, .97; test-retest reliability, .94; and interrater reliability, .64.

Prosocial behavior ratings. To measure level of prosocial behavior, the authors used the *BASC-2 Teacher Report Scale – Child Form Adaptive scale*, a composite scale consisting of the following subscales: adaptability, social skills, leadership, study skills, and functional communication. The *BASC-2* test manual reports the following technical adequacy means for this composite scale: alpha reliability, .97; test-retest reliability, .89; and interrater reliability, .61.

Behavioral incidents. Office discipline referrals (ODRs) are school-based forms designed to document serious behavioral incidents and track individual student behavior (Sugai, Sprague, Horner, & Walker, 2000). School staff issue ODRs to students for serious behavioral violations, including fighting, vandalism, harassment, or noncompliance. ODRs have been shown to possess sufficient construct validity as a behavioral measure (Irvin, Tobin, Sprague, Sugai, & Vincent, 2004), and adequate concurrent validity with standardized behavior rating scales (B. Walker, Cheney, Stage, & Blum, 2005), and ODRs have been moderately correlated with other indirect measures of problem behavior, such as student self-report of delinquent behavior (Gottfredson & Gottfredson, 1999). Additionally, the number and type of ODRs received significantly predict a range of future outcomes, including violent events in school and dropout (Tobin & Sugai, 1999). Predictive validity from one year to the next for middle and high school students has been documented at .54 (Gottfredson & Gottfredson, 1999), within the reported range of some standardized behavior rating scales.

When incidents of problem behavior occur in the participating district, school personnel complete ODR forms, which are entered into the *School-Wide Information System (SWIS)* (May et al., 2002), a web-based ODR data system, to tally total ODRs per year. To increase the reliability of ODR data, the district conducts regular trainings on discriminating between behaviors that do and do not warrant a referral, based on definitions used in *SWIS*.

Procedures

Check-In/Check-Out. The Check-In/Check-Out intervention (also known as the Behavior Education Program; Crone et al., 2003) is a manualized, tier two intervention designed to decrease problem behavior and increase prosocial behavior through direct behavior ratings of student performance. The intervention is designed to: a) add structure to the school day, b) provide regular opportunities for feedback, and c) cultivate a relationship with an adult mentor in school. In addition to the robust evidence for direct behavior ratings (see Chafouleas, Riley-Tillman, Christ, & Sugai, this issue), Check-In/Check-Out in particular has been the focus of a number of intervention studies demonstrating its effectiveness in reducing problem behavior and increasing academic engaged time for students (Fairbanks et al., 2007; Filter et al., 2007; Hawken, 2006; Hawken & Horner, 2003; Hawken et al., 2007; March & Horner, 2002).

The Check-In/Check-Out program is a multi-component intervention that consists of a) a daily meeting with an adult mentor at the start of the school day (the “check-in”), b) brief ratings and feedback from teachers at the start and end of each period, c) a debriefing with the mentor at the end of the day (the “check-out”), and d) a school note home providing information to parents/guardians. The check-in is intended to provide the student with a daily behavior rating card, engage the student in a positive interaction, and provide precorrections and encouragement. The in-class ratings are designed for teachers to prompt expected behavior and give feedback to the student while rating her/his behavior on a scale of 1 to 3 in predefined categories, usually the school-wide expectations (e.g., Safe, Responsible, and Respectful). At the check-out, the student reviews her/his behavior with the mentor, totals the points earned, and takes the card home for a parent/guardian signature. In this study, students earned points toward small tangible items or social privileges, such as school supplies or lunch with the mentor.

Prior to beginning the program, each student received a brief training session conducted by school personnel that a) taught the daily routines of the Check-In/Check-Out program, b) provided examples and non-examples of appropriate behavior in school, and c) allowed the student to practice the daily routines of the program. After training, the student began the program.

Before program implementation, the authors provided two two-hour training sessions for school personnel and then provided monthly follow-up training sessions that stressed the critical features of the intervention and mechanisms of behavior improvement. The authors advised school administrators to identify school personnel with time at the start and finish of each day to serve as Check-In/Check-Out coordinators and mentors. In four of the schools, the school counselor served as the program coordinator and mentor for the participants. In one school, the special education teacher was the coordinator, and in the final school, an educational aide was the coordinator.

Measurement. Upon referral for behavior support and parent consent, the school notified the researchers and an interview with the student's classroom teacher was scheduled. The FACTS interview and the BASC-2 were administered one to five days prior to beginning the intervention. The follow-up BASC-2 was administered approximately eight weeks after the student began the intervention.

Fidelity of implementation. Fidelity of implementation of the Check-In/Check-Out program was measured throughout the intervention phase. The authors administered nine unannounced fidelity checklists, in which fidelity was measured for multiple students. These checklists measured ten critical features of the intervention, including the student checking in and out with the mentor, the mentor providing positive feedback for using the card and contingent feedback for performance, the team monitoring student points daily, and the student taking the card home for parent feedback. The mean percentage of observed critical features in place was 94% (range 83% to 100%), indicating high levels of fidelity of implementation.

Design

Data analysis. Because of the structure of the data and the interest in assessing both individual response to the intervention and group differences, a mixed model MANOVA was employed to answer the research questions posed. The three dependent variables in the analysis were the BASC-2 Behavior Symptoms Index and Adaptive Scale, administered immediately before students received the intervention (pre score) and after eight weeks of intervention (post score). Data queries of the SWIS database provided the number of ODRs per student for the eight week period preceding the intervention (pre score) and first eight weeks of the intervention (post score). These three variables served as the repeated measures and provided an index of change in behavior based on response to the intervention. Analysis of the within-subjects main effects would determine the effect of Check-In/Check-Out on behavior. In addition, student scores were analyzed by group based on indicated function of problem behavior. Analysis of the within-subjects interaction effects between function and the main effect would determine any differences in response based on function of problem behavior. If the within-subjects main effect were to be statistically significant, the authors would be able to complete follow-up univariate analyses to determine effects on each dependent variable. Between-subjects main effects for function, indicating pre-existing differences, would not help answer the research questions posed.

Results

Results of the data analyses are reported in the following paragraphs. The analysis of main effects was statistically significant, permitting analysis of specific effects on each dependent variable and interaction effects between function and Check-In/Check-Out. The review of main effects was encouraging but puzzling until a closer review of interaction effects was examined. Results of the data analyses are provided in Tables 1 to 3.

As shown in Table 1, there was a significant main effect of Check-In/Check-Out on the dependent variables, $F(3, 30) = 4.17, p = .01$, and a significant interaction effect between function and Check-In/Check-Out, $F(3, 30) = 4.12, p = .02$. Follow-up analyses for the main effects of Check-In/Check-Out (shown in Table 2) revealed that there was not a significant effect of Check-In/Check-Out on ratings of problem behavior, $F(1, 32) = 1.12, p = .30$. The effect size (in terms of Pearson's r) associated with this difference was $r = .18$, indicating a small effect. There was a significant effect of Check-In/Check-Out on ratings of prosocial behavior, $F(1, 32) = 7.42, p = .01$. The associated

effect size was $r = .43$, indicating a medium effect. There was also a significant effect of Check-In/Check-Out on behavioral incidents, $F(1, 32) = 4.65, p = .04$. The associated effect size was $r = .36$, on the upper end of a small effect. These results indicate that, when assessing *all* participants, implementation of Check-In/Check-Out was associated with significant increases in ratings of prosocial behavior, significant decreases in behavioral incidents, and a non-significant effect on ratings of problem behavior.

An examination of the follow-up interaction effects (shown in Table 3) provides a more specific view of participant response. The interaction between function and Check-In/Check-Out for problem behavior was significant, $F(1, 32) = 9.51, p < .01$. The associated effect size was $r = .48$, indicating a medium effect. Figure 1 shows the mean differences in ratings of problem behavior by function. As seen, there is a marked difference in response to the intervention based on function. The average rating of problem behavior decreased for attention-maintained participants, while it increased for escape-maintained participants.

The interaction between function and Check-In/Check-Out for ratings of prosocial behavior was not significant, $F(1, 32) = .78, p = .39$. The associated effect size was $r = .15$, indicating a small effect. Figure 2 shows the mean differences in prosocial behavior by function. Both groups showed an increase in ratings of prosocial behavior, though there was a sharper (but not statistically significant) increase for participants with attention-maintained behavior. Likewise, the interaction between function and Check-In/Check-Out for behavioral incidents was not significant, $F(1, 32) = 2.73, p = .11$. The associated effect size was $r = .28$, also indicating a small effect. Figure 3 shows the mean differences in referrals received by function. Both groups show a lower rate of referrals after intervention, though, again, the attention-maintained group shows a steeper slope. These latter two results may have been expected given the significant main effects seen for all participants.

Discussion

This study was designed to assess main effects of a tier two behavior intervention and also to assess differences in response to the intervention based on the indicated function of problem behavior. In a school district with effective tier one and three interventions in place, a pre-post mixed design MANOVA was used to assess both main effects of the Check-In/Check-Out intervention and interaction effects by function. For all participants, results showed significant increases in ratings of prosocial behavior and decreases in behavioral incidents, but non-significant effects on ratings of problem behavior. An analysis of the role of function showed differential effects of the intervention based on the function of problem behavior, indicating that ratings of problem behavior decreased for students with behavior maintained by attention and increased for students with behavior maintained by escape from academic tasks.

These results show that there were some positive effects for both groups of students who received the intervention, including an increase in mean ratings of prosocial behavior and a decrease in rate of behavioral incidents in school. This may lead some to conclude that overall, students generally responded to the intervention, and the intervention could be used exactly as described in the treatment manual as an effective tier two intervention for behavior. However, this conclusion overlooks two important points. First, the design used to answer the first question was a simple pre-post design with no group comparisons. Hence, the results seen could have been related to unmeasured variables. Second, the significant main effects belie the more powerful interaction effects that were observed, in which group comparisons could be made. The analysis results and the graphs clearly show a difference in response based on function. Though there were significant main effects for some dependent measures, only the students with attention-maintained behavior had significant improvements in all three dependent measures. In fact, the ratings of problem behavior of students with escape-maintained behavior increased one third of a standard deviation during the intervention. It is unknown whether the increase in problem behavior was due to any possible harmful effects of the intervention or if it was related to neglecting to intervene based on students' negative academic experiences.

These results point to a critical role of function of problem behavior in behavioral interventions. Function appears to act as a moderator of the effects of a number of different interventions (Carter & Horner, in press; Filter & Horner, in press; Ingram et al., 2005; March & Horner, 2002; Newcomer & Lewis, 2004). The mechanisms underlying this link are clear when considering the structural components of an intervention. Check-In/Check-Out is designed to provide students with high rates of attention for appropriate behavior. Students are therefore provided regularly scheduled opportunities to access attention by exhibiting appropriate behavior as opposed to problem behavior. Students whose behavior is maintained by escape from academic tasks may choose to exhibit appropriate behavior

(especially if they also find attention reinforcing), but this choice does not provide relief from aversive academic task demands, the underlying maintaining consequence for problem behavior. An intervention that addresses escape-maintained behavior directly would include providing academic assistance, easier tasks, or momentary escape from tasks.

Overall, these results replicate and extend the findings of March and Horner (2002) and Carter and Horner (in press), who found a lack of positive effects for students with escape-maintained behavior and implemented tier three function-based support interventions for these students. It remains unknown whether the participants from those studies or the present study: a) required the additional support of a tier three intervention, b) could have been successful with a different tier two intervention, perhaps an academic intervention to address skill deficits (e.g., Lee, Sugai, & Horner, 1999), or c) could have been successful if the initial tier two intervention had been modified to address escape-maintained behavior.

Implications for practice. These results strongly suggest that school personnel would do well to avoid the “one trick pony” phenomenon, in which a single tier two intervention is selected and applied in the same manner to all students needing support, regardless of their individual needs. There is a distinct analogy to tier two academic interventions as well—school personnel would not find success providing an effective fluency-building intervention to all struggling readers, particularly with those who need remediation in decoding. There is an emerging view in the field that there exists the need for multiple tier two interventions in both academic and behavior support. It is even more critical when considering that special education eligibility may be determined from response to a tier two intervention. In this case, a lack of student response to a tier two intervention may be misconstrued as evidence of a disability when an equally likely explanation may be that there was a poor match between the intervention and the function of the student’s behavior.

This study identified function as one variable that deserves consideration in determining what tier two intervention to apply. For students whose identified function is escape from academic tasks, the Check-In/Check-Out intervention, delivered without any adjustments, may be a poor match with student needs. A promising approach includes a quick screening for function of problem behavior, such as the *FACTS* for students in general education, or the *Questions About Behavioral Function* (Matson & Vollmer, 1995) a rating scale for students with more severe needs, and then one of two options: a) select the best match from a number of ongoing tier two interventions in the school (Oregon Department of Education, 2005), or b) modify the intervention to provide effective support for students with escape-maintained behavior. Crone, Horner, and Hawken (2003) describe modifications that may be made to adjust the Check-In/Check-Out to enhance effects for these students.

Moreover, this paper documented the use of a tier two intervention within the context of a district implementing tiers one and three with fidelity. The paper described the utility of a tier two intervention as an efficient, ongoing system to bridge the gap between universal and individual levels of support. The tier one intervention (school-wide Positive Behavior Support) reduced the number of students requiring a tier two intervention to a manageable level (McIntosh, Chard, Boland, & Horner, 2006). The tier three intervention (individualized function-based support) provided an additional level of intervention for students who needed more than the tier two intervention (Lewis-Palmer et al., 2004). Implementing a tier two intervention without tiers one and three in place would seem to be ill-advised, given how these tiers work to provide a continuum of support to students (Fairbanks et al., 2007).

Finally, the present study highlighted the expanding role of school counselors and school social workers in providing and coordinating systems-level practices in schools in place of one-on-one counseling. The counselors who coordinated the programs in their schools were also members of the universal SWPBS committee, taught school-wide expectations and universal social skills, and facilitated functional behavior assessment and support planning in their schools. Counselors and social workers often have more flexibility at the start and end of the day than classroom teachers, and they may serve fewer schools than school psychologists, allowing for a direct connection to daily programming and troubleshooting. Hence the school counselor, in addition to the school psychologist and teacher, can play a vital role in the three tier RTI model.

Limitations. This study had several major limitations that are worth consideration when interpreting the results. First, the pre-post non-experimental design employed to assess the first research question did not control for some threats to internal validity (such as time). This is less relevant for the second question which assessed differential

response, which was a quasi-experimental design. Second, the assessment of function, though completed with an indirect measure with evidence of validity and reliability under the conditions of its use (trained and experienced behavior specialists working with respondents knowledgeable about the students and their behavior), was not validated through direct observation or functional analysis. Therefore, there exists the possibility that the functions identified for the study may have been inaccurate. Third, the sample size, though large for studies considering function, is small for group designs. Thus, the exploration of only two functions, and the ethnically homogeneous sample may not allow the results to be generalized to all students. As such, more research is needed to replicate the results of this study.

Future research. Direct and systematic replication of this study to other participant groups and settings will allow for improved external validity and generalization of results. Replication should include larger participant samples, students from diverse backgrounds, different age groups, teachers and interventionists with different skill levels and students with varying educational and behavioral needs. Replication and extension of this study should also focus on the extent to which the current results are applicable to other tier two behavioral interventions. With the goal of providing a continuum of effective, evidence-based behavioral interventions to students with problem behavior, it will be beneficial to assess the differential effects of various tier two interventions on the social behavior of students based on function of behavior.

Future research should focus not only on replication and extension of the effects of function of behavior on response to intervention, but also on examining the applicability of including a quick screening for the function of problem behavior in schools prior to selecting and implementing tier two behavioral interventions. Research should address the effectiveness and efficiency of using quick function screenings to a) modify existing tier two interventions to provide function-based support and b) to select interventions that match with the identified function of behavior. In particular, research should explore the ability of school teams to identify the function of students' problem behavior and effectively match or modify tier two interventions to provide function-based support. By examining systems for providing function-based tier two behavioral interventions school personnel will better be able to identify students who require the additional support of a tier three intervention and will better utilize the second tier of a comprehensive response to intervention model.

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Table 1

Within Subjects Analysis of Variance Summary Table

| Source | <i>df</i> | <i>F</i> | η^2 | <i>p</i> |
|---|-----------|----------|----------|----------|
| Check-In/Check-Out | 3 | 4.17* | .29 | .01 |
| Function*Check-In/Check-Out (interaction effect) | 3 | 4.12* | .29 | .02 |
| Error | 30 | | | |

Note. * $p < .05$.

Table 2

Univariate Analysis of Variance Summary Table for the Effects of Check-In/Check-Out on Each Dependent

Variable

| Dependent Variable | <i>df</i> | <i>F</i> | η^2 | <i>p</i> |
|----------------------|-----------|----------|----------|----------|
| BASC-2 BSI | 1 | 1.12 | .03 | .30 |
| Error | 32 | (22.05) | | |
| BASC-2 Adaptive | 1 | 7.42* | .19 | .01 |
| Error | 32 | (12.17) | | |
| Behavioral Incidents | 1 | 4.65* | .13 | .04 |
| Error | 32 | (1.04) | | |

Note. Values enclosed in parentheses represent mean square errors.

* $p < .05$.

Table 3

Univariate Analysis of Variance Summary Table for the Interaction of Function and Check-In/Check-Out on Each Dependent Variable

| Dependent Variable | <i>df</i> | <i>F</i> | η^2 | <i>p</i> |
|----------------------|-----------|----------|----------|----------|
| BASC-2 BSI | 1 | 9.51** | .23 | < .01 |
| Error | 32 | (22.05) | | |
| BASC-2 Adaptive | 1 | .78 | .02 | .39 |
| Error | 32 | (12.17) | | |
| Behavioral Incidents | 1 | 2.73 | .08 | .11 |
| Error | 32 | (1.04) | | |

Note. Values enclosed in parentheses represent mean square errors for the Check-In/Check-Out variable.

***p* < .01.

Figure Captions

Figure 1. Pre-post differences in BASC-2 problem behavior ratings by function of problem behavior.

Figure 2. Pre-post differences in BASC-2 prosocial behavior ratings by function of problem behavior.

Figure 3. Pre-post differences in office discipline referral rates by function of problem behavior.





