

# ผลกระทบของการให้ความช่วยเหลือทางวิชาการ และพฤติกรรมโดยใช้การวิเคราะห์พฤติกรรม ที่มีต่อ พฤติกรรมที่เป็นปัญหาและผลสัมฤทธิ์ทางการอ่าน ภาษาอังกฤษของนักเรียนระดับชั้นประถมศึกษา ในโรงเรียนนานาชาติในประเทศไทย

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## บทคัดย่อ

งานวิจัยนี้ศึกษาผลกระทบของการให้ความช่วยเหลือทางวิชาการและพฤติกรรมโดยใช้การวิเคราะห์พฤติกรรม ที่มีต่อพฤติกรรมที่เป็นปัญหาและผลสัมฤทธิ์ทางการอ่านภาษาอังกฤษของนักเรียนเกรด 3 และ 4 ที่กำลังเรียนภาษาอังกฤษ จำนวน 5 คนในโรงเรียนนานาชาติแห่งหนึ่งในประเทศไทย ทีมผู้ช่วยเหลือซึ่งประกอบด้วยครูภาษาอังกฤษที่ได้รับการอบรมวิธีการวิเคราะห์พฤติกรรมมาแล้วได้ทำการสอนและจัดการพฤติกรรมนักเรียนกลุ่มตัวอย่างเป็นระยะเวลาหนึ่งภาคเรียน การให้ความช่วยเหลือประกอบด้วย (1) การวิเคราะห์ปัจจัยภายนอกเพื่อหาทางควบคุมเงื่อนไขและสถานการณ์หลังจากพฤติกรรมเป้าหมายเกิด (2) การสอนอ่านภาษาอังกฤษโดยใช้วิธีที่มีงานวิจัยพิสูจน์แล้วว่ามีประสิทธิภาพในการช่วยเหลือประชากรกลุ่มเป้าหมาย และ (3) การปรับการช่วยเหลือให้เหมาะสมกับพื้นฐานวัฒนธรรมของผู้เรียนและผู้สอน

ผลการวิจัยด้วยวิธีวิจัยแบบ *Combined Single Subject* พบว่านักเรียนกลุ่มตัวอย่างมีพฤติกรรมที่เป็นปัญหาน้อยลง มีแนวโน้มที่จะตั้งใจเรียนมากขึ้น และมีผลสัมฤทธิ์ทางการอ่านดีขึ้น เมื่อทีมผู้ช่วยเหลือวางแผนควบคุมเงื่อนไขและสถานการณ์หลังจากพฤติกรรมเป้าหมายเกิดและปรับวิธีการสอนให้สอดคล้องกับความต้องการพิเศษทางการเรียนของนักเรียน

งานวิจัยนี้ยังมุ่งเน้นการนำเอาความแตกต่างทางวัฒนธรรมที่พบในชั้นเรียนของผู้เรียนและผู้สอนมาพิจารณาประกอบการให้ความช่วยเหลือ และพบว่าในอนาคตนักการศึกษาจำเป็นต้องคำนึงถึงปัจจัยดังกล่าวเพื่อจะมั่นใจได้ว่าการให้ความช่วยเหลือนั้นสามารถพัฒนาคุณภาพชีวิตของนักเรียนได้จริงและเป็นไปอย่างยั่งยืน

## The Effects of Function-Based Academic and Behavior Intervention on Problem Behaviors and Reading Performance for English Language Learners in a Thai International Elementary School

Chanisa Apichatabutra

### ABSTRACT

*This research investigated the effects of function-based academic and behavior intervention on problem behaviors and English reading improvement for five 3<sup>rd</sup> and 4<sup>th</sup> graders in a Thai international school. Behavior support team, including trained participant teachers, conducted an intervention for one semester. The intervention emphasized (a) functional behavior assessment strategy to identify the function of the target behaviors, (b) evidence-based effective reading instruction approach, and (c) responsiveness to cultural perspectives of teachers and students.*

*A combined single-subject methodology found a functional relationship between implementation of the intervention and decreased problem behaviors. The findings revealed the potential to increase academic engagement and reading performance for the students by following a behavior support plan based on effective reading instruction and tasks modified to accommodate students' academic needs.*

*This study incorporated culture into the intervention and found that in the future application, professionals must respond to cultural differences in classrooms to ensure that supports will meaningfully change students' lives and will be sustained over time.*

## Background

Across cultures, problem behaviors in schools pose major social problems and disrupt effective learning environments. A Thai national survey indicated that 38% of 3,037 students in Pratomsuksa 4 to Mathayom 3 reported having been bullied two to three times within the previous two months and Thai teachers reported that they acknowledged and had tried some means but still could not prevent the bullying (Tapanya, 2006). The study pointed out that more than 70% of 1,300 teachers who completed the survey perceived physical punishment as an appropriate consequence for problem behaviors.

Students engaged in problem behaviors are at higher risk than their peers for significant difficulties in academic achievement and social relationships. Substantial research shows that problem behavior not only threatens the overall school environment, but also highly predicts academic difficulties among students who engage in problem behaviors (McIntosh, Chard, Boland, & Horner, 2006; Walker & Shinn, 2002). The long-term outcomes of both antisocial behaviors and academic difficulties may include further social and academic failures (Walker, Ramsey, & Gresham, 2004).

Students with externalizing types of behavior experienced academic achievement deficits in all content areas, including reading, writing, and mathematics. In particular, reading difficulties were found to be highly associated with problem behaviors in classrooms (Barton-Arwood, Wehby, & Falk, 2005). Findings from congruent research suggested that problem behaviors and academic challenges were two main interrelated factors of student failure that often require concurrent intervention because students with problem behaviors do not appear to improve academically over time and remediation of academic difficulties becomes increasingly difficult. Given these findings, early intervening in antisocial behaviors and in academic deficits not only prevents further socially inappropriate behaviors, but also conserves time, energy, and resources for school personnel (McIntosh et al., 2006; Nelson, Benner, Lane, & Smith, 2004, Torgesen, 2002).

Most interventions, however, focus either on academic or behavior problems, leaving one or the other concern unaddressed. At the same time, effective academic interventions that lack knowledge of students' behaviors may increase inappropriate behaviors, further challenging effective academically help (Lee, Sugai, & Horner, 1999). Given that academic and behavior challenges are too closely linked to approach independently and intervene separately, comprehensive interventions that simultaneously target effective academic instruction and behavior supports. These studies designed traditional academic intervention which incorporated information on a purpose or a *function* of behavior (Barton-Arwood et al., 2005; Hagan-Burke, Burke, & Sugai, 2007). The results produced positive changes in students' academic and behavior outcomes.

Although schools have developed plans to manage problem behaviors, many educators still lack appropriate training to provide student behavior support (Gresham, 2004). Behavior interventions most studied before 1990 relied commonly on detention, suspension, or expulsion from school to punish problem behaviors (Horner, Carr, Strain, Todd, & Reed, 2002). Too often, educators pay attention to problem behavior in a person and attempt to change the person as opposed to the purpose or function of the behavior. Teachers who are lack appropriate knowledge and skill in delivering behavior interventions may inadvertently reinforce problem behaviors rather than minimize them. For example, a teacher who habitually attends to a student every time the student yells does not determine why the student yells. The teacher may inadvertently reinforce yelling behavior, although the behavior is actually the student's means to obtain something, such as attention, or to avoid something, such as undesirable tasks. Despite the intervention, the student still will conduct other types of problem behaviors in order to achieve desired results. Moreover, when the teacher targets a problem behavior but fails to consider its function, the teacher may repeat ineffective intervention and the behavior is likely to return and even get worse (Mayer, 1995). For example, if a student engages in disruptive behaviors (e.g., talking out or poking others) to avoid participating in group work, the teacher's decision to punish such conduct by sending the student to the corner to cease the disruption would likely reinforce the problem. The student has learned that being disruptive effectively serves the goal of

avoiding group work. The teacher's inattention to the function of the student's behavior may lead to more severe social and academic problems.

### **The Coercive Cycle.**

When students engage in problem behaviors, they have less time to acquire academic skills, which in turn puts them at risk for academic failure. At the same time, during instructional activities in which students find their tasks aversive, they develop a variety of problem behaviors as a mean to escape from the difficult academic demands. When students have fewer opportunities to receive positive reinforcement for on-task behavior or to acknowledge that their problem behavior results in incorrect answers, any positive behavior may disappear or be replaced by a problem behavior (Durand & Carr, 1992; Lee et al., 1999). This coercive cycle of escape-maintained problem behavior and academic failure interrupts classroom teaching and learning both for students who demonstrate problem behaviors and for those who do not (Lane, Wehby, & Barton-Arwood, 2005).

### **The Promising Cycle of Appropriate Behaviors and Academic Gain.**

In the cycle of problem behavior and academic failure, effective intervention moves from a reactive approach toward a preventive approach that changes the environments and contexts in which problem behavior occurs (Carr et al., 1999; Gresham, 2004). The proactive approach to intervention process emphasizes a change that examines how behaviors function in the environment. Positive behavior support has focused on the mechanisms by which individuals develop problem behaviors based on basic behavior principles. As a replacement of the undesired behaviors, positive behavior support puts emphasis on the teaching of socially appropriate behaviors (Sugai et al., 2000).

One effective intervention based on information about antecedents and consequences that maintain a problem behavior is to promise to replace the inappropriate behavior with a more appropriate one (i.e., staying on task). Moreover, when students receive necessary academic skills with well-planned instructional delivery, academic tasks become nonaversive and the consequences of problem behavior are no longer

reinforcing. At the same time, research has shown that students are likely to engage in on-task behavior when the consequences are more positively reinforcing (Durand & Carr, 1992). For example, a student receives sufficient skills to complete a reading task. The student works on task to complete the work correctly. As a result, the teacher praises the student for being on task and completing the work properly. As the magnitude of positive reinforcement increases, problem behaviors can be ameliorated, while more on-task behaviors can be increased. The more time students spend in on-task behavior and the less time they spend in problem behavior, the more academic skills they will acquire in order to become successful academically.

### **Conceptual Framework**

*Function-Based Intervention.* In behavior analysis literature, “function” refers to the way in which a behavior serves an individual’s purpose (O’Neill et al., 1997). Behavior function is maintained by negative or positive reinforcement. Based on the fundamental principle that human behavior is functional, predictable, and changeable, the functional behavior assessment (FBA) approach places behavior in an environmental context. The intervention support plan involves teaching an appropriate alternative behavior which makes the problem behavior irrelevant, inefficient, and ineffective. The process also attempts to identify factors that contribute to and maintain the problem behavior (Horner et al., 2002; Sugai et al., 2000).

### **Effective Reading Intervention.**

An effective intervention has two primary goals: (a) to decrease problem behaviors and (b) to increase appropriate replacement behaviors (Crone & Horner, 2003). To achieve these goals, intervention must address the behavior functions by (a) eliminating or altering the predictors that maintain problem behaviors, (b) providing appropriate replacement behaviors that serve the same function as the problem behaviors, and (c) removing the consequences that maintain the problem behaviors.

Research has shown that English reading instruction should be structured and explicit so that English language learner (ELLs) can acquire the skills necessary to understand what they read. Consensus research (Foorman & Torgesen, 2001) indicates

that students who are at risk for reading difficulties benefit from reading instruction that emphasizes early reading components skills—phonemic awareness, alphabets, fluency, vocabulary, and comprehension. Furthermore, students with reading difficulties need systematic and explicit instruction in a small group setting with more intense supports from teachers (Gersten & Baker, 2003).

### **Cultural Perspective of Intervention.**

A challenge in planning support intervention for students is to incorporate the cultural variables, including the norms, traditions, values, and religious belief of students and teachers, into the intervention plan. The cultural context of academic and behavior intervention primarily addresses what works for a particular group of students at a particular time and place, rather than providing a global approach (Gay, 2002; Kauffman, Conroy, Gardner, & Oswald, 2008). Cultural context is especially relevant when students learn a nonnative language. The difficulty of learning a new language is causally linked to problem behavior which seeks to avoid difficult demands of task assignments. Kauffman et al. (2008) reviewed literature related to three cultural dimensions—ethnicity, gender, and religion—to find evidence of responsiveness to behavioral interventions related to cultural identity. They found that an intervention developed with cultural sensitivity (a) is based on scientifically grounded approaches, (b) achieves socially valid behavioral objectives, and (c) has procedures that are acceptable to students, parents, and teachers.

### **Statement of Purpose**

The purpose of this study was to investigate the effects of a function-based intervention that was designed to decrease problem behaviors, increase academic engagement, and improve English-reading performance for ELLs in Thailand. The comprehensive intervention was based on (a) functional behavior assessment (FBA) (Walker et al., 1996), (b) effective early reading instruction and delivery (Carnine, Silbert, Kame'enui, & Tavers, 2004), and (c) cultural responsiveness (Albin, Lucyshyn, Horner, & Flannery, 1996; Gay, 2002).

## Research Questions

The primary research question addressed in this study was: “Is there a functional relationship between a function-based academic and behavior intervention that (a) is based on behavior function, (b) employs effective literacy instruction, and (c) is matched to the learners’ culture, and a decrease in problem behaviors during English reading class for ELLs in Thailand?” The secondary question explored a functional relationship between the intervention an increase in academic engagement and English reading performance for the participants, respectively.

## Methods

*Sample and Setting.* Five students in 3<sup>rd</sup> and 4<sup>th</sup> grade from an international school in Bangkok, Thailand participated in this study. The school curriculum is based on the British National Curriculum Standard (UK Government, 2008). The participations were enrolled in regular classrooms and were ELLs. The recruitment procedure began when 3<sup>rd</sup> and 4<sup>th</sup> grade teachers nominated students with problem behaviors and reading difficulty in their classrooms. Then, to verify that the function of the students’ problem behaviors was escape-maintained, a 30-min teachers’ interview was conducted using the a Functional Assessment Checklist for Teachers and Staff (FACTS) and validating direct observations using the Functional Assessment Observation (FAO) (O’Neill et al., 1997).

Across three different days, the referred students were also given three sets of three 1-min reading passages (9 passages) of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Oral Reading Fluency (DORF) Benchmark subtest (Good & Kaminski, 2003). Since no sample norm group exists for ELLs outside the United States, the participants’ DORF benchmark scores were compared to the typical performance of their grade-level peers. The teachers and the author randomly selected seven students in the 3<sup>rd</sup> grade classroom and seven students in the 4<sup>th</sup> grade classroom to develop a range of what the typical students read in both grade levels. The five selected participants had Words Read Correct per Minute (WCPM) rate in the “at risk” category based on the DORF, and showed a significant discrepancy to typical reading



performance (Howell & Nolet, 2000). Based on the participants' DORF benchmark scores, the reading materials were higher than their reading instructional level. Table 1 presents the demographic and screening information for the participants.

**Table 1.** Demographic and screening data for the participants.

Student	Gender	Age	Grade	Ethnicity	Target Behaviors	WCPM/ Errors	Norm Discrepancy
Kenso	M	9	4	Thai	Get out of seat, make excuses to leave class, play with materials, look away	43/7	2.50
Kwan	F	10	4	Thai	Look away, withdraw from tasks	58/19	1.86
Khun	M	9	4	Korean	Refuse to work, get off seat, play with materials, look away	28/8	3.86
Salim	M	8	3	Bangladeshi	Wait for answer, look at peer's work, withdraw from tasks	54/4	2.16
Gus	M	8	3	Thai	Talk out, laugh, sing, make noises, look away	63/8	1.85

*Dependent Variables and Measures.* Table 2 shows a summary of the dependent variables in this study. The primary dependent variable was the percentage of observation intervals with a problem behavior. Problem behaviors in the classroom were identified as *aggressive, disruptive, disrespect, noncompliant, and off-task*. Problem behavior was measured through direct observation using an interval record by the observers who were trained to an 85% interobserver agreement during observation training sessions. Each observation period was lasted from 15 to 20 minutes and was divided into 10-s observation intervals. An interval was scored as including a problem behavior if any problem behaviors occurred during the 10-s interval (i.e., partial interval recording). The percentage of intervals in which the problem behavior occurred was reported.

A secondary dependent variable was occurrences of academic engagement, which was observed concurrently with the problem behavior variable. Academic engagement was measured through direct observation by the observers who were trained to an 85% interobserver agreement during observation training sessions. An interval was scored as “on-task” if the students engaged in and completed tasks as assigned. An interval was scored as including on-task behaviors if the behaviors occurred at the end of the 10-s interval (i.e., momentary time sampling). The percentage of intervals in which on-task behavior occurred was reported.

Student’s reading fluency was measured via DORF Progress Monitoring subtest which measures accuracy and fluency with the code and connected text for students’ ability to (a) identify letter-sound correspondences accurately and quickly, identify familiar spelling patterns to increase decoding efficiency, (b) blend isolated phonemes to make words, and (d) use alphabetic understanding to identify words in isolation and on context fluently. This measure reported the students’ WCPM rate. The DORF’s reliability is .92. (Salvia & Ysseldyke, 2006). The DIBELS’s general validity is the content-and criterion related validity. The content is directly consistent with scientific-based research in reading focusing on the basic reading skills. Each subtest was also documented as correlated with established reading measures. The DORF subtest correlates .36 with the Reading Cluster of the Woodcock-Johnson Psycho-educational Battery (revised) (Salvia & Ysseldyke, 2006). The DORF passages were developed to be consistent in readability, reliability, and validity to the passages from the Test of Reading Fluency (TORF) (Children’s Educational Services, 1987), which is a standardized set of passages and administration procedures designed to (a) identify children who may need further intensive assessment and (b) measure growth in reading skills. Table 2 summarizes dependent variables information.

**Table 2.** Summary of Dependent Variables

Dependent variables	Measurement	Procedure	Analysis report
Problem Behavior	• Percentage of intervals with problem behaviors	• 10-sec interval recording in a 15-20 min observation	• Visual analysis
Academic Engagement	• Percentage of intervals with academic engagement	• 10-sec interval recording in a 15-20 min observation	• Visual analysis
Reading Performance	• DIBELS Oral Reading Fluency Progress Monitoring probes	• Word read correctly per minutes (WCPM) and errors	• Change in means for WCPM and errors reading growth rate

*Independent Variables.* The behavior intervention support plan for five participants included function-based behavior and academic intervention in the form of multicomponent intervention. The intervention consisted of (a) behavior support intervention, (b) an effective reading instruction program for ELLs, (c) DORF Progress Monitoring, and (d) activity patterns and opportunities for preference that reflect cultural responsiveness of the intervention.

Based on results from the FBA, including FACTS and FAO data, behavior support plans were developed. As part of the intervention, the students were taught alternative appropriate behaviors that allowed them to access the same desired reinforcement or consequences (e.g., time away from difficult tasks) as when the students engaged in the problem behaviors. The teachers also used a supplementary reading support program called *Phonics for Reading* (Archer, Flood, Lapp, & Lungren, 2002), a research-based supplemental reading program that offered additional instruction in reading deficit areas and was reviewed by Oregon Reading First (2008) as a strong supplemental reading program for struggling readers. Changing curriculum to *Phonics for Reading* was based on antecedent manipulation of the behavioral support plan since problem behaviors for all participants occurred when the tasks required high-level reading skills that the students had not mastered. The three main components of the function-based intervention included (a) a behavioral support plan, (b) an academic support plan, and (c) a cultural responsiveness plan.

The evaluation procedures included (a) informal discussion about how the interventions could be modified and made more effective, (b) analysis of data from observations, and (c) the *Contextual Fit Questionnaire*. During the second and third meetings, the team completed the Questionnaire (Salantine & Horner, 2002) to evaluate the extent to which contextual fit and cultural responsiveness were incorporated in the intervention. The questionnaire was completed by each teacher during the team meeting midpoint in the study and again at the end of the study. The behavior support team met three times after the function-based interventions were implemented to evaluate the effectiveness of the interventions. To determine the effectiveness of reading intervention, Phonics for Reading Level 1-2 Integrity Checklist (Harn & Chard, 2004) was used. The Checklist was based on main component of the lesson. The author observed the intervention and rated the integrity on a scale of 0-2 (2 = high level of implementation, 0 = low level of implementation). The observations were account for 30% of all the intervention sessions across students and interventionists.

The academic and behavioral support interventions were conducted with responsiveness to the cultural values of the students and the teachers. Since no reliable tool exists to measure cultural responsiveness in intervention practices, the evidence of cultural responsiveness in this study was collected using the contextual fit questionnaire (Albin et al., 1996; Benazzi, Horner, & Good, 2006) of the intervention procedures with the context which were influenced by the cultural values of students and teachers. Contextual fit refers to the extent to which the intervention plan incorporates the values, skills, resources, and administrative support of those who implement the plan. The degree of contextual fit indicated the extent to which the intervention was implemented with cultural responsiveness and sensitivity. Table 3 shows a summary of independent variables.

**Table 3.** Summary of Independent Variables

Independent variables	Measurement	Procedure	Analysis report
Behavioral Support Plan	<ul style="list-style-type: none"> <li>• Technical adequacy of the plan</li> <li>• Contextual fit of the plan implementation</li> </ul>	<ul style="list-style-type: none"> <li>• Behavior expert review on the Intensive Individualized Interventions Critical Features</li> <li>• Contextual Fit Questionnaire</li> </ul>	<ul style="list-style-type: none"> <li>• Technical adequacy scores</li> <li>• Contextual fit scores</li> </ul>
Effective Reading Intervention	<ul style="list-style-type: none"> <li>• Percentage of item completed with fidelity</li> </ul>	<ul style="list-style-type: none"> <li>• Phonics for Reading Program Training Protocol Checklist</li> </ul>	<ul style="list-style-type: none"> <li>• Fidelity scores</li> </ul>
Cultural Responsiveness	<ul style="list-style-type: none"> <li>• Contextual fit</li> <li>• Including students' need into the team meeting agenda</li> </ul>	<ul style="list-style-type: none"> <li>• Contextual Questionnaire</li> <li>• Permanent product of behavior support plan</li> </ul>	<ul style="list-style-type: none"> <li>• Contextual fit scores</li> <li>• Permanent product of behavior support plan</li> </ul>

## Design

A single subject research methodology is uniquely appropriate for examining behavior change across time, and the impact of individualized interventions (Horner et al., in press). The outcomes of the methodology are similar to those in group design in that they reveal a causal relationship through careful experimental control. A major difference is the use of visual analysis to define causal effects, rather than statistical analysis to confirm or reject the prediction of the phenomenon. The flexibility of the method allows researchers to tailor the designs to control extraneous variables and to match the behavior patterns that can change.

In this study, a single-subject concurrent multiple baseline design across five participants examined the impact of the intervention on the problem behaviors and reading performance of the participants. Due to ambiguous effects early in the study, the design was augmented to include ABAB reversal analysis for two of the participants. The rationale for including two single-subject design elements, combined designs, was that (a) the initial demonstration of experimental control using the multiple baseline design produced ambiguous results, (b) the study explored two dependent

variables simultaneously, (c) a multicomponent feature of the independent variable (i.e., function-based academic and behavioral intervention) and extraneous variables in natural classroom settings, made it difficult to control the experiment using only one design, and (e) combined designs demonstrated experimental control in multiple ways, yielding stronger demonstration of the effect (Kennedy, 2005).

## Procedure

*Baseline Condition.* During initial baseline, all participants received their traditional lessons. Both classrooms were in a small-group setting. The participants were called out from their regular classroom during Literacy periods to form a small group which met for 50 minutes, four times per week. Reading curricula in the focused classrooms varied by the degree of teacher choice.

*Intervention Condition.* Based on results from the FBA, behavior support plans were developed. First, the function of the behavior was determined by the FBA as escape maintained. As part of the intervention, the students were taught alternative appropriate behaviors that allowed them to access the same desired consequences (e.g., time away from difficult tasks) as when the students engaged in the problem behaviors. Changing curriculum to *Phonics for Reading* was also based on antecedent manipulation of the behavioral support plan since problem behaviors for all participants occurred when the tasks were difficult. The three main components of the function-based intervention included (a) a behavioral support plan, (b) an academic support plan, and (c) a cultural responsiveness plan. The behavior support team met three times after the function-based interventions were implemented to evaluate the effectiveness of the interventions for the participants.

*Evaluation.* The teacher participants completed the *Contextual Fit Questionnaire* (Salantine & Horner, 2002) to evaluate the extent to which contextual fit and cultural responsiveness were incorporated in the intervention. The Questionnaire was completed by each teacher during the behavior support team meetings. Social validity for this study was assessed using the *Teacher Consumer Satisfaction Survey* (Crone & Horner, 2003) to evaluate the extent to which the function-based behavior and

academic intervention were perceived by teachers as (a) effective to reduce problem behaviors, increase student engagement, and improve reading performance, (b) efficient with time and local resources and capacity, (c) easy to implement, and (d) having contextual fit for the students and classroom settings.

## Results

### **Effects of Function-Based Intervention on Problem Behavior.**

The first research question asked whether there was an established functional relationship between a function-based academic and behavior intervention and a decrease in problem behaviors during English reading class for the participants. This study initially employed a single-subject concurrent multiple baseline across five participants. During the intervention phases a reversal design element was added for Salim and Gus. Figure 1 displays the percentage of intervals with problem behavior, and fidelity of implementation. Level, trend, and variability within phase data, and percentage of data overlap, immediacy of effect, and similarity of data patterns across similar phases were analyzed to assess effects.

#### *Multiple-Baseline Design*

*Baseline.* Level refers to the average value of the data within each condition. Level of data was examined using means and the extent to which the average percentage of intervals with problem behavior changed from the baseline to the intervention condition. Across five participants, the average percentage of intervals with problem behaviors in the baseline condition was 18%, ranging from 0% to 36% (see Table 4).

Trend refers to the rate of increase or decrease of the best-fit straight line that can be placed over the dependent variable (i.e., percentage of intervals with problem behavior) within a condition (i.e., slope and magnitude). During the baseline condition, data for Kenso, Kwan, and Khun demonstrated a medium to low magnitude slope. Kenso displayed an increasing slope of a problem behavior pattern while Kwan and Khun showed a decreasing slope. During the initial baseline condition, Salim demonstrated an increasing trend in problem behavior. The trend was not established for Gus due to the variability of data during his initial baseline condition.

Variability refers to the degree to which data points fluctuated around the level and the trend in a condition (e.g., if the data points are very close to the best-fit straight line in the condition, the data pattern demonstrates a low variability). During the baseline condition, Kenso displayed a moderate variability of percentage of intervals with problem behavior (range 0–36%). Due to time constraints of the study and contextual fit of the traditional class schedule and teacher availability, Kenso’s baseline condition could not be prolonged so as to develop a more stable data pattern. Low variability was observed for Kwan (range 3–31%) and for Khun (range 8–34%). During the initial baseline condition, Salim displayed moderate variability of percentage of intervals with problem behavior (range 0–26%). High variability of data pattern was observed for Gus (range 15–53%), making it impractical to develop a trend. During the second baseline, the data demonstrated a moderate variability pattern for Salim (range 15–32%) and Gus (range 12–34%).

**Table 4.** Means and change in means for problem behavior.

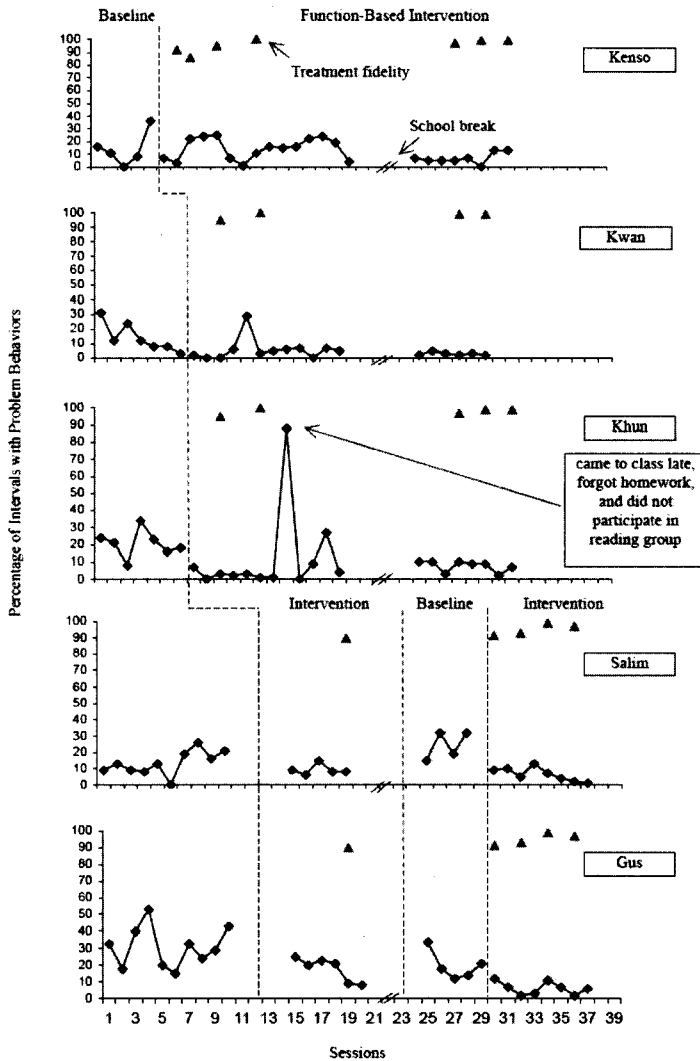
Student	Percentage Intervals with Problem Behavior					
	Baseline Phase		Intervention Phase		Overall	
	M	Range	M	Range	Change	% Overlap
Kenso	14%	0–36%	12%	0–25%	–2	100%
Kwan	14%	3–31%	5%	0–29%	–9	61%
Khun	21%	8–34%	6%	0–27%*	–23	37%
Salim	17%	0–32%	7%	1–15%	–10	100%
Gus	27%	12–53%	11%	2–25%	–16	64%
Total	18%	0–53%	9%	0–29%	–9	

\*Outlier data of 88% intervals with problem behavior were excluded from this report analysis.

*Function-based intervention.* During the intervention phase, the participants’ mean was 9%, ranging from 2% to 29%, which was considered a 9% decrease. However, for Kenso, 100% of data points for the intervention condition overlapped with data for the baseline condition. A partial overlapping data pattern was observed for Kwan (61%) and Khun (37%). During the intervention condition for Kenso, a low magnitude slope suggested a restricted meaningful data pattern. The trend was not



established for Kenso. For Kwan and Kenso, a decreasing slope of a problem behavior pattern was displayed. During the initial intervention phase, Salim displayed a low magnitude slope. Gus displayed a medium magnitude slope with an increasing pattern of problem behavior. Low baseline levels of problem behavior for Kenso and decreasing baseline patterns for Kwan limit the study's ability to demonstrate a compelling effect. In response to this challenge the design was augmented to include ABAB reversal analyses for Salim and Gus.



**Figure 1.** Effects of function-based academic and behavior intervention on problem behavior.

### *ABAB Design*

*Baseline.* During the second baseline for Salim and Gus, all procedures of the interventions were withheld. The reversal design enhanced the replication of baseline behavioral patterns and the intervention effects. The data pattern for Salim showed 100% of overlapping data between the two baseline conditions and the two intervention conditions. Gus's data demonstrated 64% of overlapping data. During the second baseline, Salim displayed an increasing trend while Gus displayed a decreasing trend.

*Function-based intervention.* The data pattern in the second intervention condition suggested decreasing trends in problem behavior for both Salim and Gus. For the initial intervention condition, Salim and Gus each demonstrated a low variability of data pattern (range 6–15% for Salim; 8–25% for Gus). A similar pattern was found during the second intervention condition for Salim and Gus, with a range of 1–13% and 2–12% respectively.

*Summary of Analysis.* Horner et al. (2005) noted that a functional relationship may be compromised when (a) a long latency occurs between manipulation of the intervention and change in the dependent variable, (b) mean changes across conditions are small or the data in adjacent conditions share similar values, and (c) trends do not conform to those predicted following introduction or manipulation of the intervention. Based on the above criteria, a functional relationship was documented for Khun, Salim, and Gus, indicating that their decrease in problem behavior was the effect of the function-based academic and behavior intervention. The results indicated that the experimental control was established.

### **Effects of Function-Based Intervention on Academic Engagement.**

The second research question in this study asked whether there was an established functional relationship between a function-based academic and behavior intervention and an increase in academic engagement for the participants. Figure 2 displays the relationships between the two variables and the fidelity of implementation. Data for the participants' academic engagement during baseline and intervention conditions were collect concurrently with data for problem behaviors. Table 5 illustrates the means for baseline and intervention phases for five participants' academic engagement.

*Multiple-Baseline Design*

*Baseline.* Across five participants, the average percentage of intervals with academic engagement in the baseline condition was 85%, ranging from 53% to 100%. During baseline condition, data patterns for Kenso, Kwan and Khun demonstrated medium magnitude slopes. Kenso and Kwan displayed increasing slopes of academic engagement. Khun’s data revealed no trend during the baseline due to the high variability of the data pattern. During the initial baseline condition, Salim demonstrated a minimal increasing trend in academic engagement. The trend, however, was not established for Gus due to the variability of data during his initial baseline condition. During the second baseline, trends for both Salim and Gus were not established.

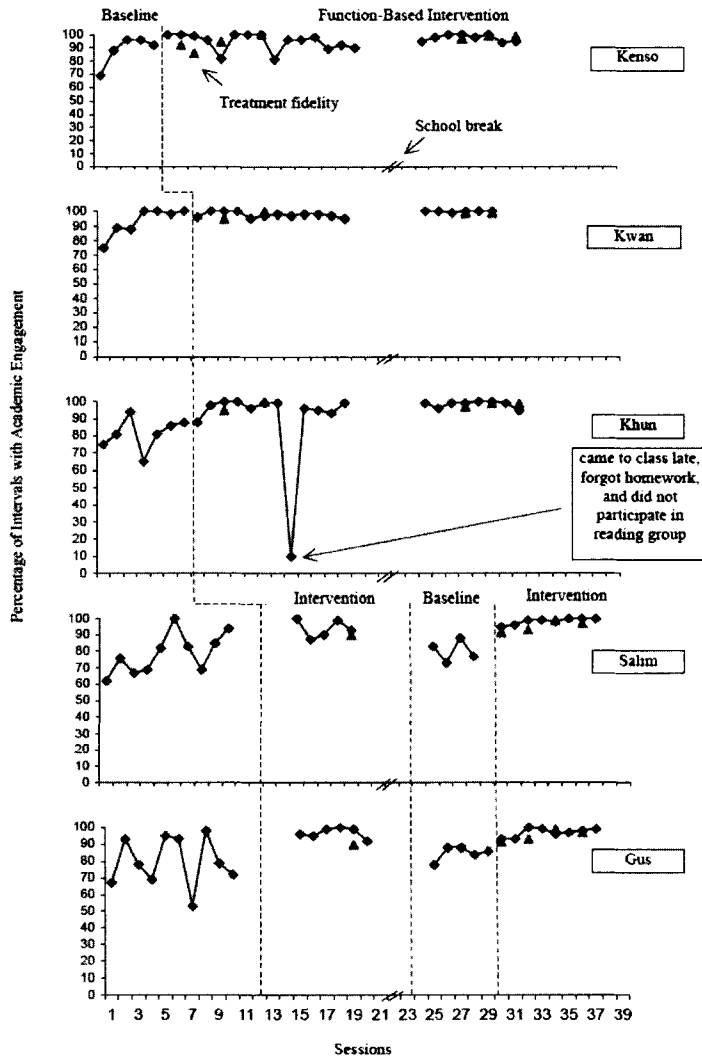
Variability of data pattern was significant for the development of functional relationships between the function-based academic and behavior intervention and academic engagement for the participants. During the baseline condition, both Kenso and Kwan displayed a moderate variability of percentage of intervals with academic engagement (range 69–96% for Kenso and 75–100% for Kwan). For Khun, a moderate to high variability of data pattern was displayed (range 65–94%). During the initial baseline condition, Salim displayed a moderate to high variability of data pattern (range 62–100%). A high variability of data pattern was observed for Gus (range 53–98%), making it impractical to develop a trend.

**Table 5.** Means and change in means for academic engagement.

Student	Percentage Intervals with Academic Engagement					
	Baseline Phase		Intervention Phase		Overall	
	M	Range	M	Range	Change	% Overlap
Kenso	88%	69–96%	96%	81–100%	+8	48%
Kwan	93%	75–100%	98%	95–100%	+5	100%
Khun	81%	65–94%	97%	88–100%*	+15	10%
Salim	79%	62–100%	97%	87–100%	+18	100%
Gus	81%	53–98%	97%	92–100%	+16	57%
Total	85%	53–100%	97%	81–100%	+12	

\*Outlier data of 10% intervals with academic engagement were excluded from this analysis report..

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**Figure 2.** Effect of function-based academic and behavior intervention on academic engagement.

*Function-based intervention.* During the intervention phase, the participants' mean was 97%, ranging from 81% to 100%, a 12% increase. However, for Kwan, 100% of data points for intervention condition overlapped with data points for the baseline condition. A partial overlapping data pattern was observed for Kenso (48%) and the data pattern for Khun displayed 10% of overlapping data. Trends in academic engagement during the intervention condition for Kenso, Kwan, and Khun revealed

a similar pattern—a low magnitude slope with a slightly upward trend. During the initial intervention condition, Salim displayed a low magnitude slope of increasing trend, and Gus displayed no trend. During the intervention conditions, Kenso, Kwan, and Khun showed a low variability of data for academic engagement, ranging from 81 to 100%, 95 to 100%, and 88 to 100% respectively. During the initial intervention condition, Salim displayed a low variability of data pattern (range 87–100%). Salim's data also indicated a significantly low variability (range 95–100%).

### *ABAB Design*

*Baseline.* The data pattern for Salim showed 100% of overlapping data between the two baseline conditions and the two intervention conditions. Gus's data displayed 57% of overlapping data. During the second baseline, the data demonstrated a moderate variability pattern for Salim (range 15–32%) and Gus (range 12–34%).

*Function-based intervention.* During the second intervention condition, both Salim and Gus continued to display a low variability of data for academic engagement, with a range of 95 to 100% and 93 to 100%, respectively. The data pattern in the second intervention condition suggested increasing trends in academic engagement for both Salim and Gus.

*Summary of Analysis.* Based on the research criteria (Horner et al., 2005), a functional relationship was documented for Khun, Salim, and Gus, indicating their increase in academic engagement as the effect of the function-based academic and behavior intervention. The results indicated that the experimental control was established.

### **Effects of Function-Based Intervention on Reading Performance.**

The third research question in this study asked whether there was an established functional relationship between a function-based academic and behavior intervention and an improvement in reading performance as measured by oral reading fluency for the participants. Figure 3 displays the relationships between the two variables. Words read correctly per minute (WCPM) and errors were displayed as dependent variables.

During the baseline phase, the students received regular support from their

teachers. DORF progress monitoring probes were administered for 3 to 7 test sessions across students. During the intervention phase, the function-based academic and behavior intervention was in place and the DORF progress monitoring probes were administered for 10 to 13 test sessions. Outcomes for the WCPM and errors depicted in Figure 3 indicated no significant reading improvement for four participants. A medium increasing trend was established for Khun, with a mean change of WCPM from the baseline to the intervention condition of 42 to 56, making a gain of 14 words. All participants showed high variability in the range of scores during the baseline (range 33–99 WCPM) and the intervention condition (range 22–107 WCPM).

*Means and Change in Means for WCPM and Errors.* Table 6 illustrates the means and changes in means for the participants' WCPM and errors rate during baseline and intervention conditions. During the baseline condition, the mean WCPM for all students was 56 words with 8 errors. Kenso read 49 WCPM with 9 errors. Compared to his 4<sup>th</sup> grade level peers' reading performance (117 WCPM) on DORF benchmark probes, he read 2.2 times lower than his peers. Kwan read 53 WCPM with 14 errors. She read 2 times lower than her peers. Khun read 42 WCPM with 5 errors, or 2.6 times below his level. Salim read 59 WCPM with 3 errors, 2 times below his level. Gus read 78 WCPM with 7 errors, 1.5 times below the performance of his peers. Using the criteria for magnitude of discrepancy, the participants showed significant risk for reading the materials at their current instructional level. During the intervention condition, the mean WCPM for all participants was 64 words with 7 errors. The discrepancy ratios between oral reading fluency of the participants and their grade level peers decreased during the intervention condition (Kenso and Kwan = 1.8, Khun = 1.9, Salim = 1.8, and Gus = 1.4). The data were insufficient to document an effect on oral reading fluency for Kenso, Kwan, Salim, and Gus resulting from the intervention. However, Khun made limited gains during the implementation of the intervention, indicating that the functional relationship may be established for Khun. Compared with baseline, intervention condition produced an increase in WCPM for all participants (see Table 6).

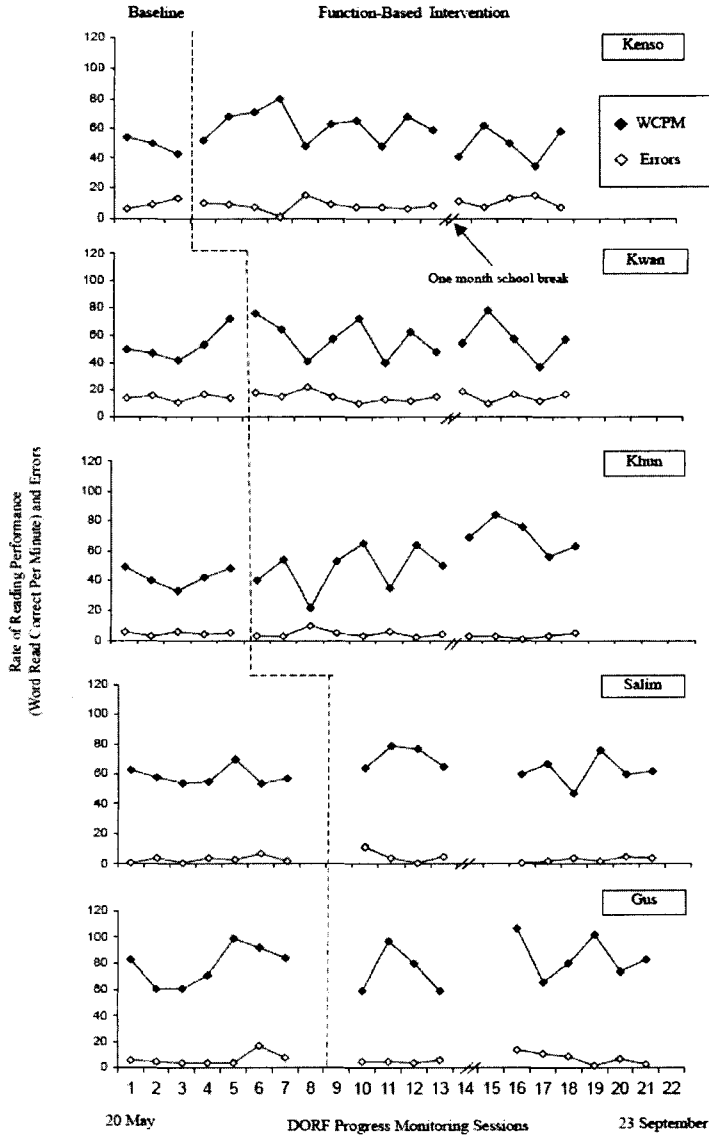
**Table 6.** Means and change in means for oral reading fluency.

Words Read Correct Per Minute and Errors						
Student	Baseline Phase		Intervention Phase		Overall	
	M	Range	M	Range	Word/Errors Gains	Classroom Norm N = 7
<b>Kenso</b>						
WCPM	49	43-54	58	35-80	+9	108
Errors	9	6-13	9	1-15	+0	
<b>Kwan</b>						
WCPM	53	42-72	57	37-78	+4	108
Errors	14	14-17	15	10-22	+1	
<b>Khun</b>						
WCPM	42	33-49	56	22-84	+14	108
Errors	5	3-6	4	1-10	-1	
<b>Salim</b>						
WCPM	59	54-70	66	47-79	+7	117
Errors	3	1-7	4	1-11	+1	
<b>Gus</b>						
WCPM	78	61-99	81	59-107	+3	117
Errors	7	4-17	7	2-14	+0	
<b>Total</b>						
WCPM	56	33-99	64	22-107	+8	
Errors	8	1-17	7	1-22	-1	

## Discussion

The FBA procedures, including teacher interviews and direct observations, identified five participants who engaged in problem behaviors that were maintained to escape from difficult reading tasks. During baseline conditions, academic and behavior supports for all participants had a high variability in instructional elements including teaching style, amount of time, and level of support. Furthermore, the academic elements of the FBA information indicated that the tasks were too difficult for the participants and that the teachers did not incorporate specific behavioral expectations and reinforcement systems in their instruction.

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**Figure 3.** Effects of the function-based academic and behavior intervention on reading performance.

*Effects of Function-Based Intervention on Problem Behavior Outcomes.* The results revealed evidence that the intervention was effective in decreasing problem behaviors of three participants. Results for Khun, Salim, and Gus showed differential effects between the function-based support conditions and the traditional English as an Additional Language (EAL) support conditions. Lower problem behaviors were



evident during the function-based support. Among the students, problem behavior decreased 17% on average (with a range of 10%–23%) from baseline to intervention condition. During the intervention condition, declining trends for the three participants and lower variability of data pattern suggested the effect of intervention.

Furthermore, an ABAB reversal design was employed for Salim and Gus. The reversal designs revealed that reduction in problem behavior was functionally linked to the use of instructional procedures that were selected based on their “fit” with the social culture and behavioral function presented by each child. This finding supports the study’s initial hypothesis of a functional relationship between function-based academic and behavior intervention and reduction in participants’ problem behaviors. Several factors led to these positive changes in the participants’ behaviors.

First, the FBA procedures, including direct observation, generated a behavioral hypothesis and a behavioral pathway for the individual participant. The hypothesis stated that when participants received difficult reading tasks during unstructured time, they exhibited escape-maintained behaviors. The students’ DORF benchmark scores of approximately two times behind a normative sample of their grade level peers on oral reading fluency, suggested their low reading skills. Literature on teacher effectiveness emphasizes that to support a student with academic difficulty, “the way a teacher teaches may need to be adjusted according to the learning needs of his student” (Howell & Nolet, 2000, p. 72). Given that the participants lacked necessary reading skills such as decoding, independent reading tasks that required knowledge about vocabulary and comprehension were problematic to them. Thus, the students engaged in problem behaviors to avoid the tasks. Function-based academic and behavior intervention provided students with initialized behavioral support matched with the function of their behavior (i.e., escape from difficult reading tasks) and taught them antecedent interventions that offered instructional support (i.e., teaching decoding skills).

A high rate of off-task behaviors occurred during the baseline condition for participant reading tasks. During the intervention condition, when the teachers changed behaviors—setting clear behavior expectations and teaching appropriate behavior, providing sufficient instruction time on decoding skills, and closely monitoring the

students' work—students learned the skills, and their problem behaviors became irrelevant, inefficient, and ineffective.

Second, changes in the behaviors were attributed to behavioral support strategies that matched the students' interests. Cultural considerations and students' individual academic needs were also incorporated into the team meeting agenda. The team discussed possible modifications of lesson plans, allowing students to practice words and sounds that they had not mastered. The team also brought up “what works” and “what doesn't” in the meeting. For example, the team considered providing more competition in the spelling lessons, which the students found enjoyable and rewarding with opportunities to earn motivating reinforcers during the lessons. The study employed Phonics for Reading (Archer et al., 2005), a Direct Instruction based program with an explicit and intense teacher-directed instructional approach. Numerous studies have found the approach effective in improving reading performance for ELLs (Linan-Thompson et al., 2002; Vaughn et al., 2005; Vaughn et al., 2006). The behavioral support team reviewed individual reading error patterns during the lessons, and used examples that matched students' background knowledge and could be understood across cultures.

Third, the function-based intervention practices were implemented with documented fidelity. Results of the fidelity of implementation outcomes for behavior support intervention, using technical adequacy and contextual fit scores, indicated that the behavior support plans were implemented with strong technical adequacy and contextual fit. Adequate documentation suggested that both behavioral and reading intervention supports were implemented with a high degree of fidelity when the teachers received training and took part in planning intervention, their anxiety about trying a new instructional approach was reduced. Ongoing supervision from the trainer ensured a high probability that the intervention was implemented with high fidelity.

Finally, a team-based approach allowed the teachers to express their interests and concerns. Team collaboration and communication of team enhanced the contextual fit and cultural responsiveness of the intervention plan and implementation. The interventions achieved a strong contextual fit score, meaning that the intervention plans

incorporated the values, skills, resources, and administrative support of those who implemented the plan (Benazzi et al., 2006; Crone & Horner, 2003; O'Neill et al., 1997). The results reaffirmed the finding of Benazzi et al. (2006) that when the behavioral support team—including members who knew the student, the setting, and behavioral theory—evaluated the intervention plans, the plans were more likely rated as having a strong contextual fit. Compared to the contextual fit scores rated by the behavioral support team in Benazzi et al. (2006), the results suggested that the behavioral support plans were technically sound and responsive to the cultural backgrounds of both teachers and students.

*Effects of Function-Based Intervention on Academic Engagement Outcomes.*

Unfortunately, the academic needs of students with problem behaviors who have academic difficulties are often compromised in order to remove problem behaviors (Wehby et al., 2003). Studies have shown that these students were likely to spend excessive amounts of time on independent worksheets (Barton-Arwood et al., 2005; Levy & Chard, 2001). Often a student who engages in disruptive behaviors is sent to an independent work area. This punishing consequence may cease the classroom disruption but it addresses neither the problem behavior nor the academic difficulty. Students whose problem behaviors are maintained by escaping from difficult tasks must receive intensive academic instructional supports modified to meet their deficits (Burke et al., 2003; Dunlap et al., 1991). The findings suggested inconclusive evidence that function-based intervention increased the students' academic engagement. Findings from this outcome showed that the results were consistent the study's hypothesis. Academic engagement for Khun, Salim, and Gus improved during the intervention condition. However, increasing initial baseline trends for the three students compromised a claim of functional effects of the function-based intervention on academic engagement. The second baseline for Salim and Gus, however, showed the strongest support for the functional relations between the intervention and academic engagement. Compared to high variability of the data during the baseline condition, academic engagement for Khun, Salim, and Gus increased and became more stable during the implementation of the function-based intervention. Informal observation reaffirmed that Khun more

confidently answered questions and responded more to teachers when he received the function-based academic and behavior intervention.

The function-based intervention sought to provide students with necessary reading skills. When the intervention included plans to increase the magnitude of positive reinforcements for engagement behaviors, the problem behaviors become less efficient than the opportunities to experience success and receive positive reinforcement. The study results were consistent with the evidence of a growing body of research on cultural responsiveness, mostly conducted with African American students: when instructional strategies reflect values, learning styles, traits, and socialization of their cultures, students' academic engagement outcomes can be significantly improved (Gay, 2002). A cultural responsive approach holds a high potential to effectively increase academic engagement for ELL participants in a highly diverse instructional environment.

*Effects of Function-based Intervention on Reading Performance Outcomes.* Reading improvement outcomes were inconclusive and unclear for most participants. A limited gain in WCPM was documented for Khun. Given that there is no research on typical reading growth rates for ELLs (Dominguez de Ramirez & Shapira, 2006), benchmark for classroom norm was used to compare the performance (Howell & Nolet, 2000). Moreover, given the one-word growth rate per week goal for 3rd grade level (Fuchs et al., 1993), nonetheless, the reading performance of Kenso (+9 words), Khun (+14 words), and Salim (+7 words) placed them at or above the increasing rate of reading growth for the grade level.

Several variables in instructional delivery posed significant challenges for the English learners in this study. First, due to the fluctuations of the school schedule, the amount of time the students received reading intervention may not have been sufficient. One study on instruction development for students with academic difficulty (Harn, Linan-Thomson, & Roberts, 2008) suggested a significant effect of intensive instructional time on progress in oral reading fluency for at-risk first grade readers. Second, the students may have encountered the compounding challenges of learning a new language while mastering subject matter and coping with the unfamiliar cultural

perspectives of the environment. Third, previous English reading competency for individual students could not be addressed. The students in the 4th grade EAL classroom had various backgrounds in learning English. For one student, the background was unknown to the teachers. Differences in English language backgrounds may significantly affect how students take on the reading instruction. Therefore, the amount level of time spent on presenting the intervention to the students could not account for the different levels of performance for students in the same English reading group.

Another finding was the high response variability across weekly probe sessions that also have been pinpointed in other reading intervention studies conducted with students with problem behaviors (Barton–Arwood et al., 2005; Wehby et al., 2003). Wehby et al. (2003) found that the high variability was not uncommon, given that the students were acquiring a new reading skill. Moreover, other factors such as fluctuating motivation, specific events in the classroom, and students' attitudes and perceptions toward the reading test may have influenced their response. For example, students may think of the one-minute timed test as a challenge game and try to read as fast as they can. This is also a possible explanation for the high rate of errors for most participants.

**Social Validity.** Teachers completed the Consumer Satisfaction Questionnaire (Crone & Horner, 2003). This social validity tool rated whether the intervention was (a) effective in reducing problem behaviors, increasing student engagement, and improving reading performance, (b) efficient with time and local resources and capacity, (c) easy to implement and (d) a good contextual fit for the students and classroom settings. The results indicated that the intervention provided behavioral impact to substantially create positive behavioral changes in targeted students. The intervention shows potential for use in other mixed-culture or high diversity school settings.

## **Implication for Practice**

Although this study was conducted in an international school, it provides implications for the provision of academic and behavior supports in the context of a Thai school. The political, economic, social, and cultural institutions in Thailand have

encountered the challenge of adapting to the educational standards of Western countries yet with far fewer resources. Educators in Thailand still lack appropriate training to provide students with effective academic and behavioral supports. This lack of training was evident in a national survey that reported that a majority of Thai elementary teachers perceived physical punishment as the most appropriate consequence for problem behavior.

This study suggests implications for preventing problem behaviors in classrooms using positive behavior support. Early intervention in antisocial behaviors and in academic deficits not only prevents further socially inappropriate behaviors for students, but also provides teachers with effective and more sustained behavioral classroom management. The FBA procedures and a team-based approach to developing a function-based intervention may also fit in the high collectivist Thai culture, in which social harmony is constantly sought (Holfstede, 1991). The explicit and well-defined function-based procedures in this study may have the potential to be replicated in a Thai school, with the support of a high-quality translation.

One additional implication of the study is the use of effective English reading instruction to provide foundational reading skills such as phonemic awareness and decoding for ELLs. The context of learning English as a foreign language in Thailand is vastly different from the context in English-speaking countries, where students use their native language in daily life. Students whose native language is not English and who do not receive an appropriate academic support may be at risk to fall behind in their reading. Their ability to become fluent readers in English, therefore, depends largely on the quality of reading instruction.

Contextual fit measures showed that teachers found the intervention appropriate and effective for students' learning. The teachers "most agreed" that students' behavior had improved, providing evidence that the function-based intervention designed in one setting and culture could be effective in another setting and culture. The key factor was collaboration and ongoing communication among the intervention team. To work effectively across cultures, the goal was to incorporate the differences with understanding.

This study carefully integrated cultural and contextual factors that affect how research methodology and implementation of function-based intervention were developed for the participants. Cultural and contextual fit must be designed for long-term results. If teachers and students find that the intervention does not bring the desired results, they likely will give up. The intervention may be too difficult, too long, too complicated, or too expensive, so that eventually it becomes modified or is terminated. An intervention that runs counter to the values of teachers and students may fail to change their behaviors.

## **Conclusion**

The results of this study reveal the potential to decrease students' problem behaviors and increase academic engagement by following a behavior support plan based on information from a systematically and carefully conducted the FBA to improve English reading performance. This improvement occurs with instruction and tasks modified to accommodate students' needs. Through effective assessment and intervention, the students made progress toward their academic achievement and behavioral expectations, and teachers were able to maintain a peaceful learning atmosphere for all students.

Despite several limitations, this experimental research has incorporated culture into behavior and academic support. In working across cultures, respectful communication among professionals probably was the most important element to ensure that the intervention support will meaningfully change the lives of students and that the support will be sustained over time. Whether consciously or not, professionals' beliefs about how academic and behavior intervention should be provided are always mediated by cultural influences. The goal is not to justify or make comparisons among cultures but to be aware that personal experiences, values, and beliefs exist. They influence the way we treat students as well as the way we work with professional colleagues. This realization is powerful. When professionals learn to appreciate and respect diverse behaviors, even when these are dissimilar to their customs and expectations, and use academic and behavior support practices that reflect students' cultural experiences and perspective, the quality of learning for students will be improved.

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