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English Learning and Learning Disabilities: Has Research Made its Way into Practice?

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Fundamental to the hypothesis-driven approach to assessing the special-education (SPED) needs of English learners (ELs) is the awareness that behaviors often exhibited by ELs may mirror indicators of learning disabilities (e.g., difficulty comprehending text, difficulty following directions, lack of appropriate classroom behavior, lack of attention). We surveyed 330 school professionals to examine their perceptions about four mirrored behaviors displayed by ELs during instruction, as indicators of either a second-language difficulty or a learning disability. Only 31% of the respondents correctly indicated that none of the behaviors can distinguish these two possibilities. The probability of correct assessment was positively associated with the level of English-as-a-Second Language (ESL) training for those with less than 15 years of teaching experience and negatively associated for those with more than 20 years of experience. Correct assessment was positively associated with years of teaching experience for those with no ESL training but negatively associated for those with any level of ESL training. Correct assessment was not generally associated with the level of SPED training. From these results, we derive recommendations for improving the training of all pre- and in-service teachers in ESL instruction to better equip them to discriminate ELs' language difficulties from learning disabilities.

The misidentification of English Learners (ELs) as students with special needs continues to be a concerning reality (Barrio, 2017; Baseggio, 2018; Kena, Aud, & Johnson, 2014; Linn & Hemmer, 2011; Ortiz, 2014; Sullivan, 2011). In the United States, the largest group of students referred to special education services, about 33%, are those with Specific Learning Disabilities (SLDs; National Center for Education Statistics, 2020), that is, “a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations” (Individuals with Disabilities Education Act [IDEA], 2018). The representation of the EL population in special education in the areas of speech language impairment, emotional disturbance, and intellectual disabilities exceeds the national percentages for the non-EL population receiving similar services in urban localities (Donovan & Cross, 2002). The five states in the United States with the largest EL populations receiving special education services have urban areas with high concentrations of Hispanics and Latinos: California (29%), New Mexico (23%), Nevada (19%), Alaska and Texas (14%; Education Week, 2012). According to DeMatthews, Edwards, and Nelson (2014), Hispanic students have a higher probability of being served under IDEA for special learning disabilities than do White students (p. 28). The belief among teachers that language learners who are struggling academically can be better served in special education programs, instead of in the general education classroom, is

widespread and, in many instances, has made special education the default path for these students (Hamayan et al. 2013; Perez & Morrison, 2016).

One possible explanation for the misidentification is that, when teachers and school professionals observe ELs struggling beyond what they expect, they prematurely consider learning disabilities as the cause (Baseggio, 2018; Collier, 2011). However, research on the intersection of bilingualism and learning disabilities (Klingner & Eppolito, 2014; Gibson & Moss, 2016; Hamayan et al., 2013) suggests that professionals must be aware that characteristics associated with learning disabilities can mirror those of second-language acquisition and therefore should be cautious in rushing to conclude that the academic struggles of ELs are due to learning disabilities. Instead, professionals should adopt a hypothesis-driven approach (Klingner & Eppolito, 2014), which maintains that, before considering within-child conditions such as learning disabilities, professionals should explore all of the factors external to the learner that may result in a learning difficulty. Only once these factors have been thoroughly examined and ruled out, should internal conditions be considered as causes of academic struggles. In the absence of the hypothesis-driven approach, school professionals may misidentify the slower academic progress that is to be expected of ELs as a learning disability, resulting in inappropriate placement of these individuals into special education.

Grounded in the hypothesis-driven approach (Klingner & Eppolito, 2014) as a conceptual framework, the current study examined the extent to which school professionals have knowledge of well-established research on the interface between second-language acquisition and disabilities. In particular, we sought to determine whether school professionals are aware that certain behaviors are associated with both second-language acquisition and learning disabilities (Klingner & Eppolito, 2014). Our intent was to assess how school professionals perceive these behaviors, whether as indicators of a struggle in second-language acquisition (SLA) or as indicators of a learning disability (LD). Given the substantial impact on the academic success of ELs that can occur when professionals confound classroom behaviors typical of SLA with indicators of LDs, it is important to understand how commonly school professionals fail to make this distinction. To our knowledge, no previous studies have quantified the extent to which school professionals possess the fundamental understanding that behaviors indicative of a learning disability are also frequently displayed by ELs as they acquire a new language.

Language Difficulty or Learning Disability? A Call for Caution

There is a robust body of scholarly work over the past 30 years exploring the factors, both external and internal, that impact an EL's academic performance (Collier, 2011; Gargiulo, 2012; Ferlis & Xu, 2016; Klingner & Eppolito, 2014; Shepherd, Linn, & Brown, 2005). This literature makes it clear that separating a struggle in SLA from an LD is neither a simple nor a quick process. The proper assessment of ELs for learning disabilities requires a multi-layered exploration of possible reasons for those difficulties, including all interventions employed and how students respond to them (Fernandez & Inserra, 2013; Hamayan et al., 2013; Linn & Hemmer, 2011). Through proper assessment, teachers can understand and contextualize the observed behaviors before special education is considered (Klingner & Eppolito, 2014). Therefore, prior to considering a disability, school professionals must seek answers to questions such as:

1. Can language learners identify and distinguish sounds in the new language that are not present in their native language?
2. Can they comprehend the meaning of the words or instructions given in the classroom?
3. Are they having difficulty concentrating or behaving in class because they feel mentally exhausted?

Teachers of ELs struggling academically must also analyze the instruments used to assess the content knowledge of these students. Such assessment instruments may misrepresent actual knowledge levels (Lesaux, 2006; Shepherd, Linn, & Brown, 2005), particularly if they are norm-referenced to monolingual students (Paradis, Genessee, & Crago, 2011), are not sensitive to what language learners can accomplish in the target language at each stage of language development, or do not provide enough time for students to complete tasks that require more sophisticated uses of the language (e.g., contextual comprehension and expression; Short et al., 2018). In their study of the classification of English learners in special education, Fernandez & Inserra (2013) report that ELs were being referred to special education within their first year of academic experience in the classroom, even though ELs need on average two to three years before they can function satisfactorily in social contexts (Cummins, 1999), and even more time, at least five years, to process and express understanding of the complexities of academic language (Cummins, 1999).

Therefore, the first steps of the evaluation process towards identifying whether an EL has a learning disability involve exploration of the learner's sociocultural context (e.g., the home context; Collier, 2015), ELs' actual abilities in the native and target languages (e.g., how literate the child is in the home language, how much English the learner indeed knows and comprehends), and the quality of instruction these students are receiving (e.g., are exemplary teaching practices being implemented to meet learners' linguistic, academic, and affective needs and give them opportunity to learn?). Teachers must adopt a variety of instructional interventions that are intentionally infused, monitored, documented, modified, and observed for at least six weeks (Collier, 2015) to gauge the learner's progress over time and collect sufficient data to rule out difficulties acquiring a second language as the cause of the observed learning struggles. Recommendations from research on second language difficulties and learning disabilities emphasize caution when interpreting ELs' classroom behaviors to avoid rushed conclusions that these students have a genuine learning disability (Hamayan et al., 2013).

Mirrored Behaviors

A necessary condition for adopting the hypothesis-driven approach is the awareness that behaviors displayed by ELs as they acquire the new language can mirror behaviors associated with learning disabilities (Klingner & Eppolito, 2014). In the present study, mirrored behaviors include difficulty following directions, difficulty remembering or responding to a stimulus due to lack of comprehension (oral or written), lack of concentration, and expression of frustration (Gargiulo, 2012; Klingner & Eppolito, 2014). As a result, the domains of specific learning disabilities can be rather subjective when assessing ELs for language and literacy-related disabilities (WIDA, 2017); therefore, the need for an in-depth evaluation that takes into consideration cultural and linguistic factors is fundamental.

Many studies have explored teachers' readiness to work with ELs (Rod & Taylor, 2005; Samson & Collins, 2012), practices deemed effective for this student population (Calderón & Slakk, 2018; Short et al., 2018), and strategies to help separate struggles in SLA from LDs (Hamayan et al., 2013). However, to our knowledge, no studies have addressed whether practicing school professionals possess the fundamental understanding, established by research findings, that behaviors indicative of LDs are also frequently displayed by ELs in their process of acquiring a new language. This study aims to fill this void.

Theory into Practice

The continued misidentification of ELs into special education programs (Barrio, 2017; Baseggio, 2018) suggests that well-established knowledge about the intersection of bilingualism and disabilities and the strategies required to distinguish these two possibilities may not have made their way into the daily practices of school professionals working with these students. Indeed, American public schools, by and large, lack qualified personnel who can work effectively with English learners (Ferlis & Xu, 2016; Garrett & Holcomb, 2005; Perez & Morrison, 2016; Sanchez, 2017), and teachers in PK-12 settings lack understanding and consideration of the sociocultural context that ELs bring to school (Collier 2015). Teachers rarely use assessment tools that take into consideration the learners' native language and level of proficiency in English (Lesaux, 2006). The inability of teachers to adopt approaches effective for a culturally and linguistically diverse group can potentially contribute to the continual misidentification of ELs as students with learning disabilities (Barrio, 2017; Baseggio, 2018; Hamayan et al., 2013).

Teacher training on effective and appropriate teaching practices and early intervention strategies for ELs is limited or done ineffectively (Fernandez & Inserra, 2013). To make matters worse, teacher-preparation programs are not equipping teacher candidates adequately in English-as-a-Second-Language (ESL) instruction, and these candidates graduate without the needed skills to support ELs in the classroom (Samson & Collins, 2012). For example, in the U.S., only 24% of elementary education programs adequately address strategies for ELs (National Council on Teacher Quality, 2014). Personnel in U.S. schools have limited access to the types of professional development initiatives that can transform teaching practices and thereby ensure academic success for English learners (Herrera, Perez, & Escamilla, 2015; Wei, Darling-Hammond, & Adamson, 2010). Recently, however, school districts have started to respond to the lack of professional training to serve the EL population. For example, in New York State, new regulations, approved by the Board of Regents and put into effect in 2015-2016, outline specific requirements that emphasize that "all teachers and administrators in the district must receive professional development that 'specifically addresses the needs of English language learners'" (New York State School Boards Association, 2014). This change in regulation was triggered by the substantial increase in EL student enrollment in New York State schools and the low graduation rate of this population (31.4%).

If a significant proportion of school professionals do not know that behaviors associated with second-language acquisition mirror those exhibited by a student with a special need or disability (Klingner & Eppolito, 2014), it becomes critical to determine how the types and extent of training, for both pre- and in-service teachers, affect their ability to discriminate language

struggles from learning disabilities. It seems likely that training in ESL would be beneficial, but training in special education, or even in the intersection of these two fields, might be required (Kangas, 2017). A deeper understanding of the needs of those working with English learners is critical to the design of effective teacher-education curricula and in-service professional development.

The Study

Guided by the hypothesis-driven approach, this study sought to determine the extent to which well-established research on the interface between second-language acquisition and learning disabilities guides school professionals' perceptions on ELs' classroom behaviors. In particular, we sought to determine whether school professionals apply the concept of mirrored behaviors in their assessment of the classroom behaviors of ELs (Klingner & Eppolito, 2014). We surveyed school professionals to assess how they perceive mirrored behaviors displayed by ELs during instruction, whether as indicators of a second-language difficulty or as indicators of a learning disability.

Our specific research questions were:

1. Can school professionals correctly identify that four mirrored behaviors (*difficulty with reading comprehension, difficulty with following directions, lack of appropriate behavior in the classroom, and lack of attention*) cannot distinguish learning disabilities from struggles in language learning?
2. Are the type and extent of training in ESL and special education associated with correct assessment of these four behaviors?

Method

Participants

To explore the tendencies of school professionals to perceive and categorize ELs' academic struggles with respect to four mirrored classroom behaviors, we surveyed 330 school professionals from 10 schools in 10 districts in two states (number of participants per school: median = 23; range = 13–106; interquartile range = 14.75–32.5). Participating school districts exhibited a wide range of EL enrollments, from those with only a few ELs in the entire school district to those whose EL population constituted the great majority of the total student population. Participants included general education teachers, special education teachers, ESL teachers, non-instructional staff (e.g., counselors, nurses, paraprofessionals, social workers), and administrators in both elementary and secondary schools. The participants were recruited by one of the authors, who provides professional development initiatives to school districts in the region where the study took place. A request was made to the school district administration of participating schools to survey the school professionals as part of the professional development initiatives. Only those professionals interested in participating in the study completed the survey.

Data were collected over a six-month period (January to June 2017). The study received approval from the Institutional Review Board (IRB) and from school districts. Participants provided consent prior to responding to the survey.

Instrument

Participants in the study were provided with a survey in paper format that asked them about the extent of their teaching experience, training to work with English learners, and training to work with students with special needs. The instrument also assessed school professionals' perceptions of four mirrored behaviors displayed by English learners during instructional time (see Appendix A).

We concentrated on the four specific classroom behaviors because of their intersectional nature, that is, they may be typical of students with LDs as well as of those acquiring a second language (Collier, 2015; Klingner & Eppolito, 2014). We intentionally provided minimal context for each behavior to allow analysis of participants' immediate assessment when they observe those behaviors among their ELs in their professional contexts. We included the question on teaching experience to account in the statistical analyses for any understanding of the causes of these behaviors that might arise from firsthand experience with ELs rather than from formal training.

Coding of Responses

Question 1: Number of years of teaching experience. If a participant put a range of years (e.g., "2-3"), we assigned the value as the mid-point (2.5 years in this example). For individuals who listed a value above a particular number of years (e.g., "20+"), we assigned the value of the lower limit (20 years in this example). We included only years of instructional experience; we assigned a 0 to the 16 participants (4.8% of all participants) who indicated that all of their years of experience were non-instructional (e.g., counselor, school nurse, paraprofessional, school psychologist).

Question 2: 2a. Have you received training to work with English Language Learners? and 2b: If "Yes", how many (courses & professional development)? The amount of training to work with ELs was converted to four levels. We assigned participants a value of 0 if they indicated "No" to Question 2a. For those answering "Yes," we categorized the expressed amount of training to work with ELs to three, clearly differentiated levels. We assigned a value of 1 if participants had at least one, and up to four, courses or professional development (PD) opportunities in ESL or bilingual education, a value of 2 if they had a minimum of five courses that led to a certificate, and a value of 3 if they completed a degree in ESL or bilingual education (bachelor's or higher). Levels 2 and 3 were assigned without regard to whether participants had also attended PDs. Degrees clearly provide more in-depth and advanced training than certificates, which in turn clearly provide more advanced and integrated training than do independent courses or PDs. Although courses certainly provide more training than PDs, we were unable to separate those who, when providing a low number of trainings, did not specify whether those trainings were courses or PDs, and therefore, we grouped these individuals into the same category. Despite the variability within those whom we scored a 1, individuals in this group clearly received more training than those who were scored a 0 and less training than those with a score of 2. We

excluded 8 participants (2.4%) who answered “Yes” for Question 2a but left Question 2b blank, 12 (8.8%) who provided vague answers (e.g., “can’t count”, “some”, “many”), and 12 (3.6%) for whom we could not conclusively determine whether their responses fit in category 1 or 2.

Question 3: 3a. Have you received training to work with special needs? and 3b. If “Yes”, how many (courses & professional development)? Responses to this question were converted to the same four-level system as were responses to Question 2 using an analogous measure (none, PDs and courses, certification, or degrees in special education). We excluded 41 participants (12.4%) who answered “Yes” for Question 3a but left Question 3b blank, 29 (8.8%) who provided vague answers (e.g., “a lot”, “multiple”, “many”), and 16 (4.8%) for whom we could not determine whether they fit in category 1 or 2.

Question 4: What specific classroom behaviors would suggest to you that an EL has a learning disability and not a language difficulty? For each of the four classroom behaviors listed in Question 4, we assigned a 1 if the response indicated that the participant knew that the behavior could not distinguish between struggles typical of second-language acquisition and a learning disability, and a 0 if the response indicated that the participant thought that the behavior could distinguish the two possibilities. For the vast majority of responses (92.3%), participants checked either “Yes” or “No”, and we scored these responses as 0 and 1, respectively. Twenty-two respondents (6.7%) did not check “Yes” or “No” for all four behaviors, but instead wrote in something that indicated that they understood that a behavior or behaviors could not distinguish between a struggle in SLA and an LD (e.g., “maybe”, “yes if...”, “sometimes”, “possibly”). We scored these responses as 1, and they represented 7.4% of all responses. Ten respondents (3.0% of all respondents) left the “Yes” and “No” boxes blank and instead added to the “Other: (please explain the behavior)” box an indication that the four behaviors cannot distinguish between a struggle in SLA and an LD (e.g., “all can be due to either”, “depends on years in country”); for these individuals, we scored all four behaviors as 1. One participant checked “Yes” for reading comprehension but indicated in the “Other” box “reading comprehension depends if they are reading in own language.”; we scored this specific behavior for this specific respondent as a 1. Taken together, these alternative scorings were applied to just under 10% of both respondents and total responses.

We assigned one of three scores (-1, 0, 1) for “Other: (*Please explain the behavior*)”. If the participant left this box blank, we assigned a 0. We assigned a 1 if the participant listed a behavior, strategy, or intervention that could suggest that an EL has an LD and their struggle is not due to the acquisition of the new language (e.g., “when work is translated in their language, and they still have difficulty”, “when many different strategies have been used to help the student and the student still hasn’t retained any information”, “when progress is not made after 20-25 weeks of intervention”). We assigned a -1 if the participant listed a behavior that could not distinguish between a struggle in SLA and an LD (e.g., “not able to respond to a question due to lack of comprehension”, “anger when asked to complete tasks”, “retaining math facts”). We therefore assigned three scores, rather than just the two (0, 1) we had assigned for the four behaviors we specified, because the behaviors listed by participants may or may not distinguish between LDs and LDs, whereas the four behaviors we specified cannot.

Statistical Analyses

All statistical analyses were conducted in SAS Studio, and statistical significance was set at $\alpha = 0.05$. Some participants did not answer all of the questions, and therefore, sample sizes differ among the various statistical tests. Because years of teaching experience, level of ESL training, and level of Special-Education (SPED) training were not normally distributed, we used rank procedures to calculate correlations involving these three variables.

Researchers typically analyze survey data such as ours by summing the scores for each individual behavior to produce a composite measure (0 – 4), and then determine the relationship between this summed score and predictor variables (in our case, years of classroom teaching experience, level of ESL training, and level of SPED training). Although the scores summed from the four behaviors exhibited high reliability (KR-20 = 0.85; MacDonalds's omega $\omega = 0.90$), their distribution was strongly bimodal (Figure 1), which precluded parametric tests to determine how the summed score was related to the three predictor variables. Similarly, we ruled out variable reduction through principal component analysis because the principal components scores produced by this analysis were also strongly bimodal.

Instead, we conducted logistic regression based on generalized estimating equations (GEE) (Liang & Zeger, 1986; Zeger & Liang, 1986). Logistic regression was appropriate because participants' responses to the four questions about classroom behaviors were binary ("Yes" or "No") and GEE because responses to the four questions were correlated with each other (see Results). We also included in the model the two- and three-way interactions among the three main effects variables. To determine whether the probability of responding "No" differed across the four classroom behaviors, we included a categorical variable, Behavior, with four values (reading comprehension, following instructions, lack of appropriate behavior, lack of attention) as a fourth predictor variable. To account for similarities among participants that might arise from working at the same school, we used a nested model, with participants nested within schools.

GEE has the advantage of allowing for missing values in response variables, and hence we excluded from the analysis only those participants who did not provide a response for any of the four behaviors or who had missing values for one or more of the three predictor variables. These exclusions resulted in a sample size for the logistic regression analysis of 197.

GEE requires the specification of a working correlation matrix (Liang & Zeger, 1986). Two working matrix structures seemed theoretically plausible for our data: unstructured, in which correlations among responses differ among the pairs of behaviors, and exchangeable, in which correlations among responses are the same. We used Pan's (2001) quasi-likelihood under the independence model criterion (QIC) to determine which of the two structures better fit the data. QIC for the unstructured covariance matrix was smaller than for the exchangeable structure (difference = 0.87), indicating that the former fit the data slightly better than the latter.

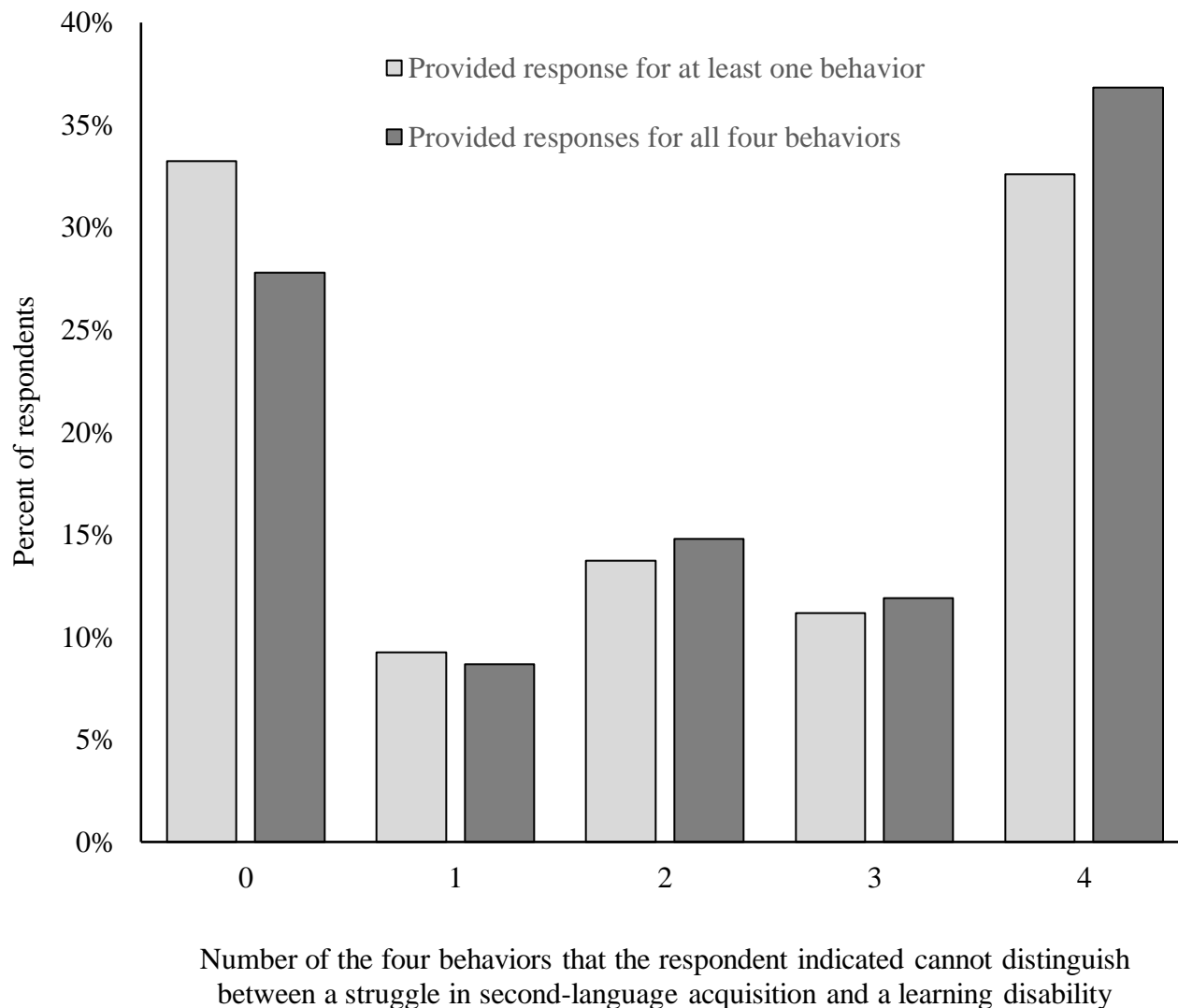


Figure 1. Number of the four behaviors exhibited by English-language learners that respondents indicated do not allow one to discriminate between a struggle in a new language and a learning disability (equivalent to the number of answers to Questions 4a-d scored as 1.). Light gray bars represent all participants who provided a response for at least one behavior, whereas dark gray bars include only those individuals who provided responses for all four behaviors. Individuals who did not provide a response for any of the four behaviors are not included in this figure.

We used a model-selection approach (Burnham & Anderson, 2004) to compare how well models with different sets of predictor variables fit the data. We used QIC_u (Pan, 2001) to determine model fit; lower values of QIC_u indicate models that better fit the data, and the difference between a model's QIC_u and that of the model with the lowest QIC_u (ΔQIC_u) provides an indication of the relative plausibility of models. As a rule of thumb, models with ΔQIC_u of less

than two can be considered as equivalent to the model with the lowest QIC_u , those with ΔQIC_u less than six should not be entirely discounted, and those with ΔQIC_u above 10 should be considered improbable (Symonds & Moussalli, 2011). In the Results, we present the 95% confidence set of models, i.e., the group of top-ranked models whose cumulative QIC weights are equal to, or just exceed, 0.95 (Symonds & Moussalli, 2011).

To determine whether the responses of participants to Question 4e (“Other”) were associated with years of classroom teaching experience, level of ESL training, and level of SPED training, we conducted a multinomial logistic regression (Hosmer, Lemeshow, & Sturdivant, 2013), with these three variables as main effects and all two- and three-way interactions. A multinomial analysis was required because the response variable was coded as three values (-1, 0, 1). We used the likelihood ratio test (Hosmer, Lemeshow, & Sturdivant, 2013) to determine whether the main effects and interactions were associated with the probability of identifying other behaviors that can distinguish between an SLA struggle and an LD, and we used Akaike’s Information Criterion (AIC) to determine model fit (Burnham & Anderson, 2004) in a manner analogous to our use of QIC_u for the GEE analysis.

Results

Descriptive Statistics

Participants had a median of 12 years of teaching experience (Table 1). Most (70%) had some SPED training, whereas only 43% had any ESL training, and participants had statistically significantly higher levels of SPED training than ESL training (Table 1, Wilcoxon signed ranks test, $S = 1424$, $p = 0.0002$, $N = 207$). Years of teaching experience, level of ESL training, and level of SPED training were not correlated with each other (Spearman rank correlation, absolute value of $r_s \leq 0.15$, $p \geq 0.049$, $N \geq 207$, Bonferroni-corrected $\alpha = 0.017$). None of these three variables were univariately correlated with whether participants answered “Yes” or “No” to each of the four questions about classroom behaviors (rank biserial correlations, absolute value of $r_{rb} \leq 0.09$, $p \geq 0.13$, $N \geq 206$).

Table 1.

Descriptive Statistics for Participants in the Study

Variable	Mean (SD)	Median (IQR)	N
Years of teaching experience	12.71 (9.47)	12.00 (4.5 – 19.0)	325
Level of ESL training	0.59 (0.93)	0.00 (0 – 1)	291
Level of SPED training	1.08 (1.14)	1.00 (0 – 2)	232

SD = standard deviation, IQR = Interquartile range

For the individual classroom behaviors, slightly over half of the participants indicated that the behavior could not be used to distinguish between a struggle in SLA and an LD (Reading comprehension: 52.5% [95% CI: 46.7–58.4%]; Following instructions: 51.7% [45.9–57.4%]; Lack of appropriate behaviors: 53.2% [47.4–59.0%]; Lack of attention: 53.4% [47.5–59.1%]).

Less than one third of the participants (30.9%) correctly indicated that none of the behaviors distinguish the two possibilities (among those answering all four questions, this percentage increases to 36.8%). The probability that participants correctly indicated that a behavior does not distinguish between a struggle in SLA and an LD was associated among the four classroom behaviors; phi coefficients ranged from 0.40 to 0.67 and were statistically significant for all pairs of behaviors (Table 2).

Table 2.
Phi Coefficients (Correlations) Describing the Strength of Association between Responses to Questions about the Four Classroom Behaviors

Behavior	Behavior		
	Following instructions	Lack of appropriate behavior	Lack of attention
Reading comprehension	0.54***	0.45***	0.58***
Following instructions		0.62***	0.65***
Lack of appropriate behavior			0.70***

*** p < 0.0001, Fisher exact test, N = 277

Effect of Training in ESL and SPED

Here we summarize the results of the statistical tests examining the relationship between the extent of training in ESL and SPED and knowledge that the four behaviors cannot distinguish between a struggle in SLA and an LD; details of the results of these statistical analyses are given in Appendix B. The best-fitting statistical model revealed that the level of ESL training was an important factor in determining whether participants knew that the four behaviors cannot distinguish between a struggle in SLA and an LD, but the effect of ESL training depended in a complex way on the number of years of teaching experience, as indicated by the inclusion in the model of an interaction term between ESL training and years of teaching experience. SPED training did not appear to have a strong, independent effect on participant knowledge but instead had its effect through its interaction with years of teaching experience. The best statistical model did not include the Behavior term, indicating that participants did not think that some behaviors were more likely than others to distinguish between SLA struggles and LDs.

For individuals with years of teaching experience equal to, or less than, the median (i.e., 0-12 years), the probability of correctly indicating that the mirrored behaviors do not distinguish between struggles in SLA and LDs increased with increasing training in ESL but did not change with increasing SPED training (Figure 2). As teaching experience increased from 12 to 20 years, the relationship between knowledge of mirrored behaviors and level of ESL training reversed, and for participants with more than 20 years of teaching experience, the probability of correctly indicating that the four behaviors do not distinguish struggles in SLA and LDs declined with increasing levels of ESL training but was largely independent of level of SPED training. The reversal of the relationship between level of training in ESL and knowledge of mirrored behaviors occurred relatively rapidly between 15 and 20 years of teaching experience. For those

with around 18 years of teaching experience, the likelihood of indicating that the four behaviors could not distinguish SLA struggles from LDs was not related to the level of ESL training but did increase with increasing SPED training. Examination of the complete set of “heat maps” for each year of teaching experience showed that the transitions illustrated in Figure 2 were smooth, with no abrupt changes between any two consecutive years of teaching experience.

The relationship between teaching experience and the probability of correctly indicating that the four classroom behaviors do not distinguish between SLA struggles and LDs differed between those who did or did not have ESL training (Figure 3). For participants who have had no ESL training, the probability increased with increasing teaching experience, whereas it decreased with increasing teaching experience for individuals with any of the three levels of ESL training (Figure 3). Participants with the highest level of ESL training (i.e., degrees) and no teaching experience exhibited very high probabilities of correctly indicating that the four classroom behaviors do not distinguish between SLA struggles and LDs (Figure 3).

Most of the participants (N = 273, 83.0%) did not list any behaviors for Question 4e “Other (please explain the behavior)”. Of the 17% who did list a behavior, roughly half (N = 27, 8.2% of total participants) successfully identified behaviors, strategies, or interventions that would differentiate SLA struggles from LDs, whereas a similar proportion (N = 29, 8.8% of total participants) provided behaviors, strategies, or interventions that cannot discriminate between SLA struggles and LDs. Years of classroom teaching, level of ESL training, and level of SPED training were not associated with the probability that participants listed other behaviors that would allow them to distinguish between SLA struggles and LDs.

Discussion

For each of the four mirrored classroom behaviors, just over half of the participants in the survey correctly indicated that the behavior does not allow one to conclude that the behavior indicates an LD rather than an EL, and only about a third correctly indicated that none of the behaviors can distinguish the two possibilities. These results suggest that a substantial proportion of school professionals may tend to draw premature conclusions that struggling ELs have a learning disability without properly exploring the factors external to the learner and therefore more accurately contextualizing and explaining those classroom behaviors. These results suggest that school practices may be likely to ignore the hypothesis-driven approach when assessing ELs. In addition, our results show that the majority of participants were not aware that the behaviors ELs exhibit as part of learning English mirror behaviors exhibited by students with LDs. Thus, fundamental knowledge established by research in the intersection of second-language acquisition and learning disabilities has not been as widely implemented in practice as is needed (Bassegio, 2018). However, our results do indicate that this research has made its way into current ESL teacher-preparation programs, as the respondents with high levels of ESL training and little teaching experience (i.e., those likely to have recently completed degrees in teaching ESL) were very likely to indicate that mirrored behaviors do not distinguish between SLA struggles and LDs (Figures 2 and 3).

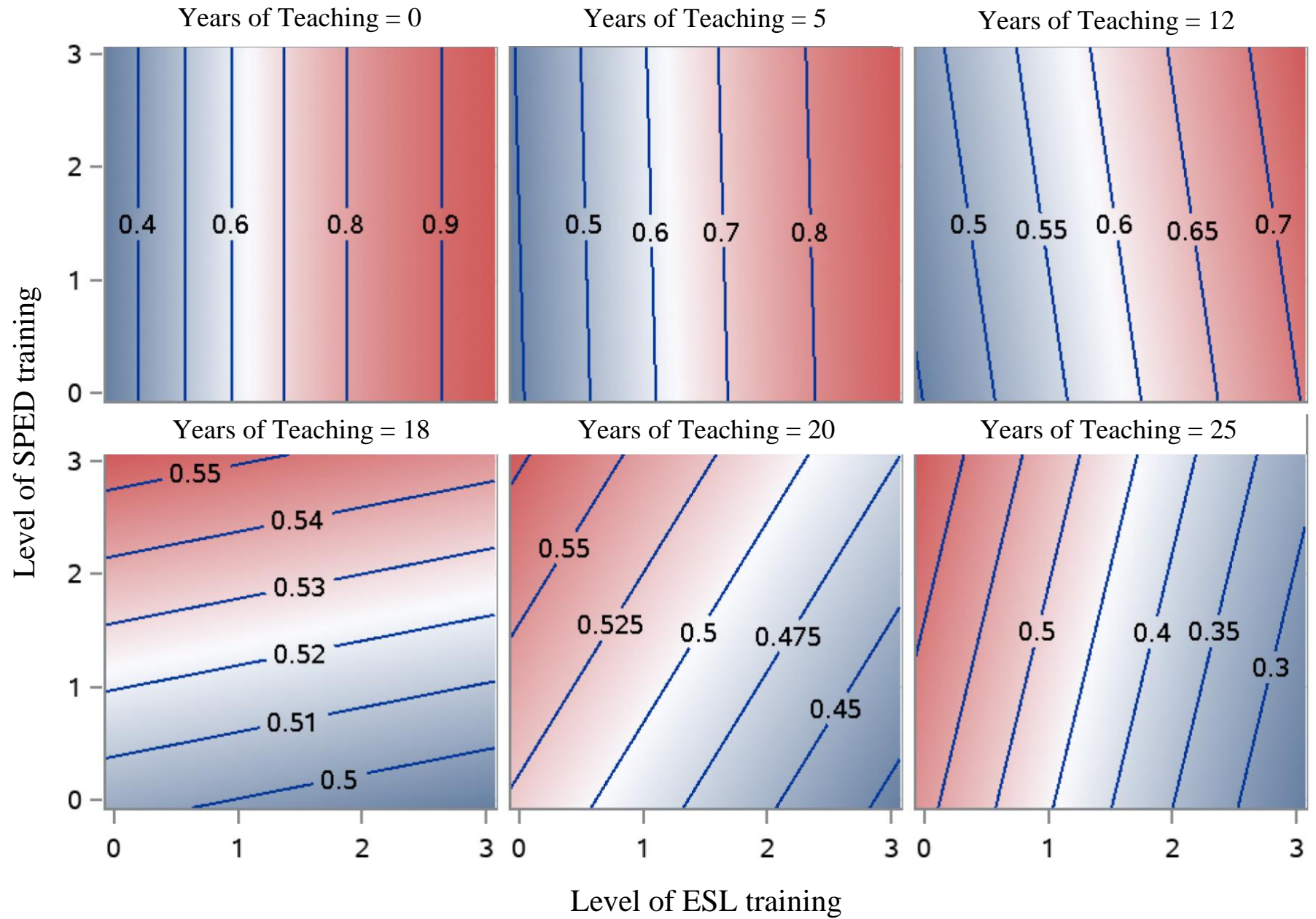


FIGURE 2. Contour plots showing how likely survey respondents were to correctly indicate that the four classroom behaviors do not allow one to discriminate between struggles in second-language acquisition and learning disabilities. The probabilities are those predicted by the logistic regression model for different levels of training in ESL and SPED and are plotted for six values of teaching experience. These values represent the span of years of teaching experience and correspond to percentiles of the distribution of teaching experience (0 years = 0th percentile, 5 years \approx 25th percentile, 12 years = 50th percentile, 20 years \approx 75th percentile, and 25 = 90th percentile), with the exception of 18 years, which was chosen to illustrate the transition between 12 and 20 years. Plots are “heat maps”, with darker red representing a higher probability of correctly indicating that the behaviors do not distinguish struggles in second-language acquisition and learning disabilities, and darker blue representing a lower probability of correct indication. Blue lines are isobars, with numbers denoting the probability of correct indication. For example, in the first panel (Years of Teaching = 0), as one moves from right to left, the color shifts from blue to red and the values on the isobars increase, indicating an increasing probability of correctly identifying that the four classroom behaviors do not allow one to discriminate between a struggle in second-language acquisition and a learning disability. The increasing probability parallels the increase in the level of ESL training. In contrast, for any given level of ESL training, as one moves from bottom to top in the first panel, the color remains constant and the isobars are vertical, indicating that the probability of correct indication does not change with increasing level of SPED training. See text for description of the levels of training.

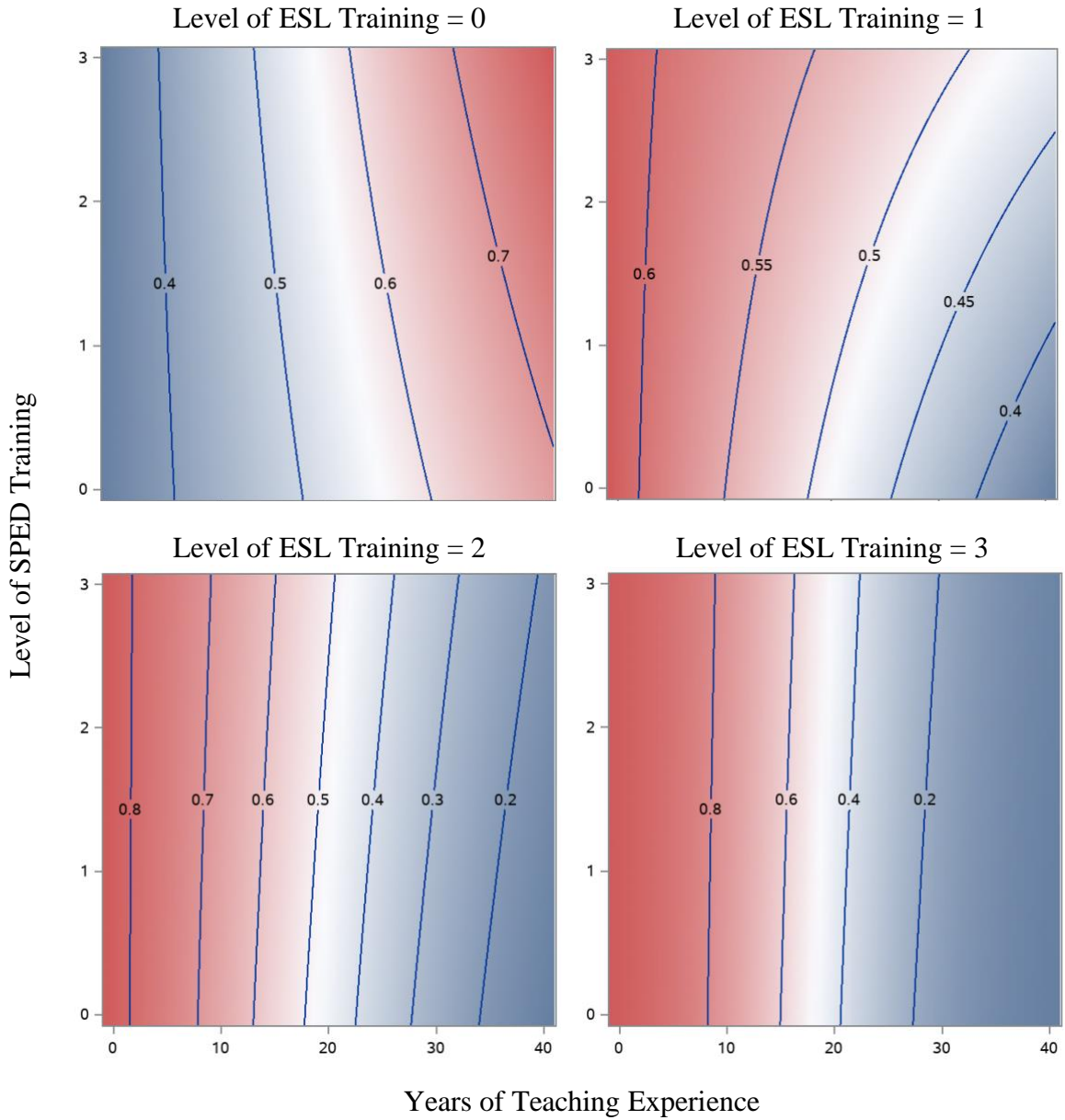


FIGURE 3. Contour plots showing how likely survey respondents were to correctly indicate that the four classroom behaviors do not allow one to discriminate between struggles in second-language acquisition and learning disabilities. The probabilities are those predicted by the logistic regression model for different levels of training in SPED and different years of teaching experience and are plotted for the four values of level of ESL training. See Figure 2 for explanation.

The probability of participants correctly indicating that the four classroom behaviors cannot distinguish struggles in SLA from an LD increased with increasing ESL training for participants with less than 15 years of teaching experience but decreased with increasing ESL training for participants with more than 20 years of teaching experience (Figure 2). One possible explanation for this pattern is that those with more teaching experience received their training in ESL long before ESL training shifted its focus towards sheltered English instruction (Sheltered English Instruction [SEI], 2013). Therefore, these individuals were not trained to adapt content instruction to the level of English proficiency of individual students as were those participants with less teaching experience. The latter received professional training that, from the onset, was grounded on frameworks that emphasize language development and a sociocultural approach to teaching and learning, which are in line with the hypothesis-driven approach (Herbert & Bond, 2013). As a result, despite their lower level of teaching experience, these respondents seemed more likely to indicate that neither of the four behaviors are able to distinguish struggles in SLA from learning disabilities.

For those with no training in ESL, it was the teachers with greater experience who were more likely to indicate that the four classroom behaviors cannot distinguish between struggles in SLA and LDs (Figure 3). It may be that, as teachers gain experience, their interactions with ELs might demonstrate to them that the four behaviors in the survey are common among ELs, and through witnessing the progress of these students both academically and linguistically, teachers come to understand that the four mirrored behaviors are characteristic of both SLA struggles and LDs. Alternatively, it could be that those with less teaching experience are more likely to be individuals who are currently not classroom teachers (e.g., counselors, school nurses, paraprofessionals, school psychologists). Although some of the participants self-identified as non-classroom professionals when indicating their years of teaching experience, the survey did not explicitly ask participants to indicate their professional role, so we cannot identify with certainty all of the non-classroom professionals in our study. However, we consider this hypothesis less likely than the one described above because we observed a gradual shift in the heat maps as teaching experience increased from zero, rather than an abrupt shift from zero to one, as would be expected if the professionals in the zero-teaching-experience group represented a different group than those with a few years of teaching experience.

In contrast to the positive relationship revealed for those with no ESL training between teaching experience and the probability of correctly indicating that the four behaviors could not distinguish between SLA struggles and LDs, those with any level of ESL training exhibited a decline in this probability as teaching experience increased. This pattern may be the result of the changes over time in the content of ESL training described above. Those with more teaching experience may have received their ESL training longer ago, and hence during a time when ESL training did not emphasize a hypothesis-driven approach or the concept of mirrored behaviors, compared to those with the same level of training but less teaching experience. If this hypothesis is correct, then it appears that ESL training several decades ago may have overridden the increase in the understanding of mirrored behaviors that appears to come with increasing teaching experience that is suggested by the results for those with no ESL training. This hypothesis would be supported for our study if the number of years since individuals received ESL training was positively correlated with their years of teaching experience.

Overall, the level of SPED training was not associated with whether respondents indicated that the four behaviors cannot distinguish SLA struggles from LDs, and it was only for participants with 15-20 years of teaching experience that there appeared to be such a relationship (Figure 2). Although we cannot rule out the possibility that such a relationship is genuine for this narrow window of teaching experience, we think more likely that the observed relationship is an artifact of the reversal during this span of teaching experience of the relationship between the level of ESL training and whether participants indicated that the mirrored behaviors are not distinguishing.

Limitations

The main limitation of the study was that the survey did not solicit from participants additional information about variables that may be important determinants of correctly identifying that the four behaviors do not discriminate between LDs and LDs. Specifically, the survey did not ask participants to identify their role as school professionals and their demographic characteristics (e.g., gender, race, ethnicity, age). The specific roles of the respondents might affect their likelihood of indicating that the four behaviors cannot distinguish between an SLA struggle and an LD either because of the specific training that they had received for their specific roles beyond any ESL or SPED training or because individuals typically attracted to particular roles share common characteristics (e.g., attitudes, perceptions). Comparisons between different types of classroom teachers (e.g., elementary and secondary teachers) might also reveal relationships that could inform teacher-training programs. Demographic variables might be important because they may be related to the degree to which bias influences the perceptions of school professionals of the capabilities of students struggling with language acquisition, which in turn may affect the probability that professionals view ELs from a deficit-thinking perspective. Future research that explores the influence of these and other variables will provide a more complete picture of the variation among professionals in their knowledge of mirrored behaviors.

Another limitation of our study was the phrasing of the questions that asked participants how many courses and professional development opportunities they had in ESL and SPED. As a result of that phrasing, some respondents provided a single number without specifying whether the number represented PDs or courses or a mixture of the two. Because the extent of training in a course is substantially greater than in a PD, the lack of specificity in responses forced us to group together in one level of training (i.e., at least one, and up to four, courses or PDs) individuals who almost certainly had different levels of training (e.g., one PD vs. four courses). Although the level of training for individuals in this group (scored as 1) was clearly greater than that for those with no training (scored as 0), and clearly less than that for those who have received certification (scored as a 2), our inability to more finely separate the individuals scored as 1 prevented us from examining the extent to which courses and PDs might have differential effects on whether individuals know that the four behaviors cannot discriminate between struggles in SLA and learning disabilities. An understanding of these effects would have important implications for the training of school professionals.

Recommendations

The finding that a majority of the participants was not aware that common classroom behaviors exhibited by ELs mirror behaviors exhibited by students with LDs reveals a gap between fundamental knowledge established by research and practice in the school setting, especially for those with little or no ESL training or those whose training at whatever level may have occurred some time ago. This gap in knowledge suggests that training in the intersection of behaviors associated with SLA and LDs is critical for both teacher-education programs and professional development for in-service professionals. Our finding that individuals with both high levels of ESL training and substantial years of teaching experience were not very likely to indicate that the mirrored behaviors do not distinguish struggles in SLA and LDs reinforces the frequently cited need for even highly trained in-service professionals to remain abreast of scholarship in their fields (Calderón, 2016).

The observation that, across a bit more than half of the range of teaching experience, participants with high levels of ESL training were most likely to know that the four classroom behaviors do not distinguish SLA struggles from LDs further supports the importance of ESL training in helping all school professionals separate the struggles experienced by those acquiring the dominant language from those experienced by students with an LD (Baseggio, 2018; Hamayan et al., 2013). Training in interventions that consider both ESL and SPED explanations for classroom behaviors is one of the key elements in helping reduce the misidentification of new language learners as students in need of special education services (Hamayan et al., 2013; Kangas, 2017; Klingner & Eppolito, 2014).

To help reduce the likelihood of confounding struggles in SLA with LDs, training should strengthen the ability of teachers, at all levels, to evaluate a language learner's academic performance through effective, culturally sensitive (Paris & Alim, 2014), content-based instruction that addresses the various stages of second language development and that monitors the progress of students over time, particularly in the higher grades (Fernandez & Inserra, 2013). Especially important are strategies that intentionally infuse language and literacy components for the acquisition of content knowledge (Orosco & Abdulrahim, 2017). Training should also emphasize the importance of exploring the learners' sociocultural context and their home culture (Chu & Wu, 2010; Herrera, Perez, & Escamilla, 2015) because understanding their unique family and community contexts allows for clearer interpretation of their behaviors in the classroom. Also critical is the learner's ability in the native language (Herrera, Perez, & Escamilla, 2015); by assessing what learners can do in their mother tongue, teachers can explore the linguistic interdependence between the two languages and create instructional bridges to facilitate comprehension in the new language. This strategy allows for closer monitoring of a learner's academic progress, or lack thereof, over time.

Our finding that training in SPED had little effect on whether participants knew that the four behaviors do not distinguish a struggle in SLA from an LD suggests that SPED teacher-education programs and SPED in-service professional development should integrate ESL training. Doing so will reduce the likelihood that struggles in SLA and LDs will be confounded and that students who struggle with SLA alone will be recommended for special education. A focus on the intersectionality of these two fields will help school professionals appreciate how

the types of classroom behaviors incorporated into our survey cannot distinguish struggles in SLA and LDs without proper information-seeking, intervention, and observation of academic progress over time (Collier, 2015; Klingner & Eppolito, 2014).

We found that the school professionals most likely to indicate that the four classroom behaviors could not distinguish struggles in SLA from LDs were those with certifications and master's degrees in ESL. This result poses a dilemma for teacher-education programs as it suggests that substantial ESL training is imperative for all teachers. However, it is unrealistic for teacher-education programs to ensure that all teachers have advanced qualifications in ESL upon graduation. A more promising approach would be to adopt infusion models where ESL training is offered to all pre-service teachers graduating from a teacher-education program, similar to the ESL infusion models used in the state of Florida in the U.S. (Govoni, 2011).

School administrators face a dilemma with in-service teachers similar to that faced by teacher-education programs with pre-service teachers in that it is impractical for all in-service teachers to obtain advanced credentials in ESL. The infusion model of teacher training would eventually solve this dilemma, but in the meantime, an effective and practical approach would be to train in-service teachers in models of collaboration for determining whether a language learner's struggle is due to language difficulty or a disability (Hamayan et al., 2013). According to Fearon (2008), despite the effectiveness of the program models adopted by school districts (e.g., dual language, push in/ pull out), close collaboration between language specialists and content teachers has a greater impact on learners' learning than the specific program model itself. Closer collaboration among general education professionals, language specialists, and special educators, through their shared expertise, can facilitate language learners' learning in the content areas, while considering their level of proficiency in the new language (Hamayan et al., 2013). It is then critical that special educators seek input from ESL teachers as they make decisions about SPED placement for ELs. As professionals seek help from one another, they can create instructional contexts to facilitate learning and more easily determine whether the learners' difficulties are related to language proficiency or a disability (Shepherd, Linn, & Brown, 2005). Lack of collaboration leads to 'disconnected and disjointed' instruction for language learners, does not engage them in meaningful and successful learning, and puts them at risk of being suspected of having a learning disability (Baecher, 2014). To facilitate closer teacher collaboration, it is essential that teacher education programs, teacher educators, school administrators, and school professionals think of creative and feasible ways to allocate time for common planning and teaching to give those acquiring a new language access to quality instruction and opportunities to be appropriately assessed.

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References

- Barrio, B. L. (2017). Special education policy change: Addressing the disproportionality of English language learners in special education programs in rural communities. *Rural Special Education Quarterly*, 36(2), 64-72. doi:10.1177/8756870517707217
- Bassegio, K. (2018). A silent crisis: The misidentification of English language learners as students with learning disabilities. *All Regis University Theses*, 865. Retrieved from <https://epublications.regis.edu/theses/865/>
- Baecher, L. (2014). *Policies and practices to promote English language learner academic success*. Retrieved from <http://ciep.hunter.cuny.edu/policies-and-practices-to-promote-english-language-learner-academic-success/>
- Burnham, K. P., & Anderson, D. R. (2004). Multimodel inference: Understanding AIC and BIC in model selection. *Sociological Methods & Research*, 33(2), 261-304. <http://dx.doi.org/10.1177/0049124104268644>
- Calderón, M. (2016). A whole-school approach to English learners. *Educational Leadership*, 73(5). http://www.ascd.org/publications/educational_leadership/feb16/vol73/num05/A_Whole-School_Approach_to_English_Learners.aspx
- Calderón, M. E., & Slakk, S. (2018). *Teaching reading to English learners grades 6-12*. Thousand Oaks, CA: Corwin.
- Chu, S. Y., & Wu, H. P. (2010). *Understanding literacy practices in culturally and linguistically diverse children's homes*. Retrieved from <http://education.jhu.edu/PD/newhorizons/Journals/Fall2010/Chu-Wu>
- Collier, C. (2011). *Seven steps to separating difference from disability*. Thousand Oaks, CA: Corwin. <http://dx.doi.org/10.4135/9781452219424>
- Collier, C. (2015). *RTI for diverse learners: Separating difference and disability* (PowerPoint slides). Retrieved from http://www.slideshare.net/catcollier/separating-difference-and-disability-35980442?next_slideshow=1
- Cummins, J. (1999). *BICS and CALP: Clarifying the distinction*. Retrieved from <http://files.eric.ed.gov/fulltext/ED438551.pdf>
- DeMatthews, D. E., Edwards Jr., D. B., Nelson, T. E. (2014). Identification problems: US special education eligibility for English language learners. *International Journal of Educational Research* 68, 27-34.
- Donovan, M. S., & Cross, C. T. (Eds.). (2002). *Minority students in special and gifted education*. National Research Council; Committee on Minority Representation in Special

- Education. Washington, DC: National Academy Press. Retrieved from <http://www.ed.gov/about/reports/annual/osep/2002/index.html>.
- Fearon, K. (2008). *A team teaching approach to ESL: An evaluative case study*. Unpublished master's thesis, Kean University, Hillside, New Jersey.
- Ferlis, E., & Xu, Y. (2016). Prereferral process with latino English language learners with specific learning disabilities: Perceptions of English-as-a-second-language teachers. *International Journal of Multicultural Education*, 18(3), 22–39. <https://doi.org/10.18251/ijme.v18i3.1113>
- Fernandez, N., & Inserra, A. (2013). Disproportionate classification of ESL students in U. S. special education. *The Electronic Journal of English as a Second Language*, 17(2). Retrieved from http://www.tesl-ej.org/wordpress/issues/volume_17/ej66/ej66a1/
- Gargiulo, R. M. (2012). *Special education in contemporary society: An introduction to exceptionality*. Los Angeles, CA: Sage.
- Garrett, J. E., & Holcomb, S. (2005). Meeting the needs of immigrant students with limited English ability. *International Education*, 35(1), 49-62.
- Gibson, S. A., & Moss, B. (2016). *Every young child a reader*. New York, NY: Teachers College.
- Govoni, J. (2011). The evolution, experiences, and lessons learned with ESOL infusion in Florida. *The Tapestry Journal*, 3(2), 1-6.
- Hamayan, E., Marler, B., Sánchez-López, C., & Damico, J. (2013). *Special education considerations for English language learners: Delivering a continuum of services* (2nd ed.). Philadelphia, PA: Caslon Publishing.
- Herbert, P. M., & Bond, K. (2013). *Sheltered English instruction: Training of trainers workshop*. Retrieved June 15, 2020, from <https://www.state.nj.us/education/bilingual/pd/sei/sei.pdf>
- Herrera, S. G., Perez, D. R., & Escamilla, K. (2015). *Teaching reading to English language Learners: Differentiated literacies*. New York: Pearson.
- Hosmer, D. W., Jr., Lemeshow, S., & Sturdivant, R. X. (2013). *Applied logistic regression* (3rd ed.). New York, NY: Wiley. <http://dx.doi.org/10.1002/9781118548387>
- Individuals with Disabilities Education Act (May 25, 2018). *Sec. 300.8 (c) (10)*. Retrieved from <https://sites.ed.gov/idea/regs/b/a/300.8/c/10>
- Kangas, S. E. N. (2017). That's where the rubber meets the road: The intersection of special education and dual language education. *Teachers College Record*, 119, 070306.

Retrieved from

http://www.sarakangas.com/uploads/3/0/1/0/30101275/kangas_2017_tcr.pdf

Kena, G., Aud, S., & Johnson, F. (2014). *The condition of education 2014*. Retrieved from <http://nces.ed.gov/pubs2014/2014083.pdf>

Klingner, J., & Eppolito, A. M. (2014). *English language learners: Differentiating between language acquisition and learning disabilities*. Arlington, VA: Council for Exceptional Children.

Lesaux, N. K. (2006). Building consensus: Future directions for research on English language learners at risk for learning disabilities. *Teacher College Record*, 108(11), 2406-2438. <http://dx.doi.org/10.1111/j.1467-9620.2006.00787.x>

Liang, K. Y., & Zeger, S. L. (1986). Longitudinal data analysis using generalized linear models. *Biometrika*, 73(1), 13-22. <http://dx.doi.org/10.1093/biomet/73.1.13>

Linn, D., & Hemmer, L. (2011). English language learner disproportionality in special education: implications for the scholar-practitioner. *Journal of Educational Research and Practice*, 1(1), 70-80. <http://doi.org/10.5590/Jerap.2011.01.1.06>

National Center for Education Statistics. (2020). *Students with disabilities*. Retrieved from https://nces.ed.gov/programs/coe/indicator_cgg.asp

National Council on Teacher Quality. (2014). *2014 Teacher preparation review*. Retrieved from https://www.nctq.org/dmsView/Teacher_Prep_Review_2014_Report

New York State School Boards Association. (2014). *Regents approve new requirements to serve English language learners*. Retrieved from <http://www.nyssba.org/news/2014/09/18/on-board-online-september-22-2014/regents-approve-new-requirements-to-serve-english-language-learners/>

Orosco, M. J., & Abdulrahim, N. A. (2017). Culturally responsive evidence-based practices with English language learners with learning disabilities: A qualitative case study. *Educational Borderlands: A Bilingual Journal*, 1, 26-44.

Ortiz, S. O. (2014). Disproportionality and English language learners in special education: Why it happens and what to do about it [PowerPoint slides]. Retrieved from http://esc9.courseinsite.com/file_attachments/3111.pdf

Pan, W. (2001). Akaike's information criterion in generalized estimating equations. *Biometrics*, 57, 120-125.

Paradis, J., Genesee, F., & Crago, M. B. (2011). *Dual language development & disorders: A handbook on bilingualism & second language learning*. Baltimore, MD: Brookes.

- Paris, D., & Alim, H. S. (2014). What are we seeking to sustain through culturally sustaining pedagogy? A loving critique forward. *Harvard Educational Review*, 84(1), 85-100.
- Perez, C. P., & Morrison, S. S. (2016). *Understanding the challenges of English language learners and increasing college-going culture: Suggestions for school counselors*. In *VISTAS online: Ideas and research you can use*. Retrieved from https://www.counseling.org/docs/default-source/vistas/article_81_2016.pdf?sfvrsn=4
- Rod, C. E., & Taylor, S. S. (2005). Language difference or learning disability? Answers from a linguistic perspective. *Clearing House* 78(3), 127-130.
- Samson, J. F., & Collins, B. A. (2012). Preparing all teachers to meet the needs of English language learners: Applying research to policy and practice for teacher effectiveness. *Center for American Progress*. Retrieved from <http://files.eric.ed.gov/fulltext/ED535608.pdf>
- Sanchez, C. (2017). English language learners: How your state is doing. *National Public Radio Education*. Retrieved from <https://www.npr.org/sections/ed/2017/02/23/512451228/5-million-english-language-learners-a-vast-pool-of-talent-at-risk>
- Shepherd, T. L., Linn, D., & Brown, R. D. (2005). The disproportionate representation of English language learners for special education services along the border. *Journal of Social and Ecological Boundaries*, (1.1), 104-116.
- Short, D. J., Becker, H., Cloud, N., Hellman, A. B., & Levine, L. N. (2018). *The 6 principles for exemplary teaching of English learners*. Alexandria, VA: TESOL Press.
- Sullivan, A. L. (2011). Disproportionality in special education identification and placement of English language learners. *Council for Exceptional Children*, 77(3), 317-334. Retrieved from <http://deb.davis.pbworks.com/w/file/attach/81120626/journal%202.pdf>
- Symonds, M. R. E., & Moussalli, A. (2011). A brief guide to model selection, multimodel inference and model averaging in behavioural ecology using Akaike's information criterion. *Behavioral Ecology and Sociobiology*, 65(1), 13-21.
- Wei, R. C., Darling-Hammond, L., & Adamson, F. (2010). *Professional development in the United States: Trends and challenges*. Dallas, TX: National Staff Development Council.
- Zeger, S. L., & Liang, K. Y. (1986). Longitudinal data analysis for discrete and continuous outcomes. *Biometrics*, 42(1), 121-130.

APPENDIX A
Instrument

1. Number of years of teaching experience:
2. Have you received training to work with English Learners?
 - a. _____Yes _____No
 - b. If “Yes”, how many (courses & professional development)?
3. Have you received training to work with individuals with special needs?
 - a. _____Yes _____No
 - b. If “Yes”, how many (courses & professional development)?
4. What specific classroom behaviors would suggest to you that an EL has a learning disability and not a language difficulty?

Behaviors	Yes	No
Reading comprehension		
Ability to follow instructions		
Lack of appropriate behavior in the classroom		
Lack of attention when instruction is being delivered		
Other (<i>Please explain the behavior</i>)		

APPENDIX B

Details of Statistical Results

All of the GEE logistic regression models in the 95% confidence set contained years of teaching experience, the level of ESL training, whereas only half of the models contained the level of SPED training (Table 4). All of the models contained the two-way interaction between years of teaching experience and level of ESL training, but the other two-way interactions were found in only roughly half of the models. Less than half of the models contained the three-way interaction. All but one of the models contained a two- or three-way interaction with level of SPED training.

The best-fitting model (Table 3) contained two main effects (years of teaching experience, level of ESL training) and two, two-way interactions (years of teaching experience*level of ESL training, years of teaching experience*level of SPED training). Four other models had ΔQIC_u 's < 2 , and hence represent good candidate models; each differed from the top fitting model in whether they include the level of SPED training or a variable interacting with the level of SPED training. Independently removing from the top three model the three variables common to all models (i.e., years of experience, level of ESL training, the interaction between years of teaching and level of ESL training) increased QIC_u by ≥ 6.3 . Adding the variable Behavior to the top four models increased QIC_u by ≥ 6.0 .

Taken together, these results indicate that years of teaching experience, level of ESL training, and the interaction between these two variables are important components of the true model, whereas Behavior is not. The importance of the level of SPED training, as a main effect, is not as clear as it is not present in the top three models. However, interactions between the level of SPED training and other main effect variables were present in all but one model, and removal of the level of SPED training or interactions (or both from the fifth-best model) increased QIC_u by > 400 . Thus, it appears that the interaction between the level of SPED training and other main effects is an important component of the true model.

Although the top five models are all reasonable candidate models, we present our results based on the best-fitting model because conclusions based on that model are the same as those based on the other four.

Table 3
The 95% Confidence Set of Best-Ranked Logistic Regression Models.

Model terms							QIC _u	ΔQIC _u	Weight
Years	ESL	SPED	Years*ESL	Years*SPED	ESL*SPED	Years*ESL*SPED			
X	X		X	X			994.66	0.00	0.175
X	X		X			X	994.86	0.20	0.158
X	X		X		X		995.24	0.59	0.130
X	X	X	X				995.41	0.76	0.119
X	X	X	X	X			996.22	1.57	0.080
X	X		X		X	X	996.72	2.06	0.062
X	X		X	X	X		996.72	2.06	0.062
X	X	X	X			X	996.87	2.22	0.058
X	X	X	X		X		997.26	2.61	0.047
X	X	X	X	X	X		998.22	3.57	0.029
X	X		X	X	X	X	998.51	3.85	0.025
X	X	X	X		X	X	998.73	4.08	0.023

Years = Years of teaching experience, ESL = Level of ESL Training, SPED = Level of SPED Training. Interaction terms are indicated by an asterisk between main-effect variables (Years, ESL, SPED). QIC_u = quasi-likelihood information criterion for correlated data (smaller values indicate better fit), ΔQIC_u = difference between QIC_u and the best-fitting model (i.e., the one with the smallest QIC_u). Weight = probability that a model best fits the data.