

Isolating Intrinsic Processing Disorders from Second Language Acquisition

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Abstract

Differentiating intrinsic processing disorders from extrinsic factors, such as cultural differences and language acquisition proficiency, is a complex issue. Students with limited English proficiency (LEP) may be mistakenly identified as learning disabled due to inherent similarities between intrinsic processing deficits and the process of second language acquisition. The need for evaluation instruments to separate these discrete factors is critical. The Learning Disabilities Diagnostic Inventory (LDDI) is a recently published observational tool designed to help teachers detect possible intrinsic processing disorders. This study compared LDDI results of non-disabled students with LEP and those who were English-speaking to determine the frequency of intrinsic processing likelihood. Results of the study indicated that non-disabled students with LEP were over-identified as having intrinsic processing deficits through this process. Upon examination of individual LDDI protocols, the over-identification issue focused on the need to train educators concerning second language acquisition characteristics rather than simply discarding the LDDI as a possible tool.

The National Joint Committee on Learning Disabilities (2001) defines learning disabilities in part as a “general term that refers to heterogeneous groups of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities” (p. 27). It goes on to state that the “disorders are intrinsic to the individual and presumed to be due to central nervous system dysfunction” (p. 27). Often, these intrinsic processing disorders manifest themselves as academic failure in the classroom, leading to referral for special education services. Unfortunately, the indications of intrinsic processing disorders are often more difficult to assess than other causes of academic failure.

The issue of determining the causes of academic failure whether it is extrinsic factors, such as a lack of adequate instruction, or intrinsic processing disorders (i.e., listening skill deficits) is particularly difficult to identify in students learning English as a second language (ESL) and identified as Limited English Proficient (LEP). This inability to distinguish between extrinsic and intrinsic factors in students who are LEP has often led to misdiagnosis of learning disabilities in these students (Ortiz & García, 1995). Baca and Cervantes (1998) state that “it has been well established that bilingual children and minority children in general have historically been misplaced and thus, over-represented in special education programs” (p. 16). This study examines a teacher-report method for evaluating intrinsic processing behaviors in one group of non-disabled, English-only speaking students and a second group of non-disabled, LEP students.

Assessing Intrinsic Processing Disorders

The federal definition and criteria for determining learning disabilities continues to include the basic psychological processing factors as essential to the explanation of a learning disability. A lack of consensus among educators as to how to assess them has led to the exclusion of intrinsic processing indicators in many operational criteria for identifying learning disabilities (Mercer, Jordan, Allsop, & Mercer, 1996). Attempts to develop assessment devices that identify processing abilities have, in the past, been rejected as debatable (Kavale & Forness, 1987).

Recently, Hammill and Bryant (1998) developed the Learning Disabilities Diagnostic Inventory (LDDI), which attempts to identify patterns of behaviors that point to underlying intrinsic processing disorders through teacher report. While the instrument does not purport to singularly diagnose learning disabilities in students experiencing academic failure, it does provide the examiner with a comparison of the student’s performance on behaviors categorized as typical of students with learning disabilities. This device then allows the examiner to utilize a variety of other standardized assessment instruments, as well as qualitative data to determine the presence of a learning disability.

The LDDI consists of six scales, which require an individual with first-hand knowledge of the student’s skills to rate the behaviors in each area. The scales include Listening, Speaking, Reading, Writing, Mathematics, and Reasoning. Each is comprised of items specifically observed in the classroom and identified by learning disabilities experts as “typical” of students with learning disabilities. The examiner obtains a score for each scale, which is then converted to a scaled score and compared to the standardization population. In this manner, the LDDI attempts to evaluate the student’s performance with respect to academic difficulties as “unlikely,” “possibly,” or “likely” being caused by intrinsic processing disorders.

Identifying the Causes of Academic Failure

Students identified as LEP may demonstrate similar patterns of academic dysfunction, which are difficult to isolate from learning disabilities. A student's performance may be comparable to the student with a learning disability, but in accordance with the definition of learning disability, intrinsic processing disorders may not be the cause. According to Kretschmer (1991), these students often experience apparent language deficits including a reduced communicative use of English across the curriculum, depressed language performance in academic areas, and predictable difficulties with cross-linguistic perceptions of English speech sounds. Additionally, LEP students may require alternative teaching methods from instruction in English-speaking only classrooms and may benefit from instruction that compliments their learning styles (Baca & Cervantes, 1998; Winzer & Mazurek, 1998). Superficial similarities between language and learning disabled populations and many LEP students may be manifested as an inability to successfully use English in academic setting. This situation creates many questions about these students' ability to succeed in the general classroom setting (Fletcher, Bos, & Johnson, 1999).

Common Issues in Differentiating LEP from Learning Disabilities

Ortiz and García (1995) discussed common issues associated with the identification, assessment, and placement of Hispanic students identified as learning disabled. Among these issues are the following sources of concern: (a) the characteristics of second language learners parallel those of language disordered students; (b) teachers are unable to ascertain the difference between typical linguistic development from intrinsic processing disorders; (c) failure to use a thorough language proficiency evaluation also contributes to inadequate assessment and identification; and (d) the prevalence of inadequate practices in the assessment process leads to inappropriate diagnosis. These issues fail to clarify language competency and, therefore, complicate and convolute eligibility decisions.

Characteristics of second language acquisition and perceived learning disabilities often appear so similar that they are difficult to differentiate. These characteristics include the perceived appearance of (a) intrinsic processing disorders in the second language development process, (b) behavioral differences, (c) reading difficulties, and (d) the misuse of expressive, unclear language. The following factors may be mistaken for intrinsic processing disorders:

1. A lower rate of learning may appear as an intrinsic processing disorder due to uneven development in academic areas (Hammill & Bryant, 1998). The rate of learning in LEP students may actually be negatively impacted by the rate of English language acquisition (Cummins, 1986).

2. Communicative competence may also appear to indicate an intrinsic processing disorder when, in fact, the complexity of English language acquisition may be the issue (Cummins, 1986).
3. Problem behaviors associated with intrinsic processing disorders in the area of reasoning, such as difficulty following directions and inattention may be apparent in students with LEP as well as those with learning disabilities (Ortiz and García, 1995).
4. Reading skill difficulties related to intrinsic processing disorders may also be manifested in these students' inability to identify sounds, analyze and synthesize sound sequences, and break words into phonetic units (Kretschmer, 1991).
5. Use of conceptual language including temporal and spatial terminology may be indicative of undeveloped expressive language skills that are evidenced in both students with LEP as well as in those with intrinsic processing disorders (Mercer & Mercer, 1998).
6. Finally, literacy-related aspects of language such as narrative skills, story-retelling skills, and the ability to use language abstractly may appear deficient in both students with LEP and students with diagnosed learning disabilities (Ortiz & García, 1995).

LEP students are often referred to special education. The internal process of acquiring a new language and its similarity to an intrinsic processing disorder creates confusion. Similarities between LEP students' performance and the performance of students with learning disabilities leads teachers to believe that a disorder may exist. Trends in special education indicate that Hispanic students are typically identified and served in two language-related categories of the Individuals with Disabilities Education Act (IDEA) (1997): learning disabilities and speech/language impairments (Ortiz & García, 1995). Historical studies indicate that Hispanic students were significantly over-identified in the category of learning disabilities in relation to their peers (Baca & Cervantes, 1998). Discovering or developing instruments to measure intrinsic processing disorders might aid educators in differentiating the problems of second language development versus the presence of identifiable learning disabilities.

This study examines the use of one such instrument, the Learning Disabilities Diagnostic Inventory (LDDI) with two groups of non-disabled students. This instrument was selected as a newly developed method for isolating intrinsic processing behaviors that would enable an evaluator to screen for possible learning disabilities. The first group included students who were LEP, and the second group were English-speaking only. The rationale for studying non-disabled students as opposed to looking at only identified disabled students was based on the performance of non-disabled students reported in the LDDI manual (Hammill & Bryant, 1998, p. 71). This information indicated that the average non-disabled student scored in the "unlikely"

category for an intrinsic processing disorder. This premise guided the development of the following research question: Does the LDDI identify non-disabled, normally achieving students with LEP as having intrinsic processing disorders more frequently than it identifies non-disabled, English-speaking only, normally achieving students?

Methodology

Participants

Raters

General educators ($N = 30$) of students without identified disabilities in grades 2–7 were selected to complete the Learning Disabilities Diagnostic Inventory (LDDI). Each general educator completed four LDDIs: two for English-speaking only, non-disabled students, and two for LEP, non-disabled students in their classrooms. These educators were located in urban and rural areas of Texas and New Mexico. All 30 teachers were female and ranged in age from 26 to 53 years. The average years of teaching service were 12, and all teachers were pursuing graduate degrees or additional post-baccalaureate certification in generic special education. At the time of this study, the participants had not been trained in the generic special education courses for LEP evaluation. An evaluation course that covers LEP issues was not offered until after the study was completed. The teachers were trained on the administration of the LDDI prior to completing their observations.

Students

The students included in the study ranged in age from 8 to 12 years and were in grades 2–7. All students were being served in general education and were not identified for special education services. As reported by their teachers, these students were not experiencing academic failure. The Home Language Survey (Texas Education Agency, 2001), required of all students in the participating schools, was used to identify students as speaking only English. Students, evaluated by the language proficiency evaluation team in their school using the Language Acquisition Scale (DeAvila & Duncan, 1986), and identified as LEP were then deemed eligible for the purposes of this study. Students in the LEP category were receiving services in a pull-out program during the regular school day. None of the students had been referred to or identified for services in special education prior to the study. Forty-eight percent of the sample was male and 52% was female.

Data collectors

All instructions in the LDDI administration manual for scoring were accurately followed. Two data collectors scored the results of the LDDI administrations. These data collectors hold doctorates in Special Education with certification as Educational Diagnosticians in the state of Texas. Both

data collectors “know how to interpret quantitative and qualitative information and use it to diagnose specific learning disabilities” (Hammill & Bryant, 1998). The data collectors rated the LDDI results separately and compared the results with an inter-rater reliability of .99. Additionally, the data collectors categorized the results independently and then compared the accuracy of the categorizations in three areas: positively identified, not identified, and questionable.

Measures: Description of Instrument

The LDDI (Hammill & Bryant, 1998) is a survey type instrument that uses six independent scales to identify specific learning disabilities in individuals. The independent scales include: Listening, Speaking, Reading, Writing, Mathematics, and Reasoning. Each scale includes 15 items that are associated with behaviors indicative of specific intrinsic processing disorders. Raters evaluate the frequency of each of the behaviors on a scale from 1 (most frequently) to 9 (most rarely). Raw scores are calculated by adding the scores in each scale. These raw scores are then converted to stanines and percentiles developed using normative data provided in the examiner’s manual.

LDDI stanines are standard scores with a mean of 5 and a standard deviation of 1.96. These scores can be used to examine individual performance on a scale, as well as in the development of a diagnostic profile of scores. Percentiles in the LDDI represent the distribution of scores within the representative norming sample. Educators may use these percentiles to determine how a student’s performance ranks in comparison to others in his or her age range.

The manual indicates that difference scores of two or more stanines are statistically significant. The LDDI results can be evaluated in two different methods for conducting a differential diagnosis. One method consists of examining the characteristic profile of the learner. The second method allows the examiner to look at the relationship between the stanine scores and the percentage of students in the normative sample with documented learning disabilities. This method results in a determination of the likelihood of the student having a learning disability.

The LDDI has documented reliability and validity as discussed in the examiner’s manual. Reliability for the LDDI has been established with respect to content sampling, time sampling, and inter-rater reliability. In all cases, results indicate reliability coefficients that meet or exceed .80 in magnitude with many of the coefficients at the .90 level.

Content validity for the LDDI was established through an extensive literature review in which specific learning disability descriptive behaviors were identified. Experts in the field of learning disabilities then engaged in an item validation process in which they rated each behavior according to its prevalence in students with learning disabilities. Additional empirical

procedures included item discrimination analysis, which reported coefficients between .57 and .79, and item-bias analysis using the Delta score procedure for three dichotomous groups with coefficients between .82 and .99. Confirmatory factor analysis was performed to determine the goodness-of-fit with coefficients between .90 and .96 with 90 degrees of freedom.

Criterion-related validity was established by assessing an independent sample that was not a part of the norming group. Teachers were asked to identify each student's areas of weakness prior to rating the behaviors on the LDDI. The LDDI scores and the teachers' identification of areas of weakness were then compared with 71 to 86% agreement.

Construct validity was established by examining seven basic constructs: These included: (a) age relationship, (b) interrelationship among LDDI values, (c) relationship of the LDDI to scholastic achievement tests, (d) group differentiation, (e) gender and ethnic relationships, (f) factor analysis, and (g) item validity. Group differentiation, a focus of this study, was examined among scores as well as among profiles for students without disabilities, with learning disabilities, with severe emotional disturbance, and with mental retardation. The analysis revealed that the LDDI was able to differentiate between these populations. The mean standard score for the entire sample was compared with both gender and ethnic groups (Euro American, African American, Hispanic, Asian American, and other) with almost identical means across the groups.

Normative data provided concerning the LDDI indicated that the standardization sample of 2,152 students with learning disabilities represents a fairly characteristic sampling of the United States population with respect to gender, race, ethnicity, special education placement, geographic region, and family income. Demographic characteristics for the raters, which included 522 professionals, were also presented in the manual and indicated that the random sampling procedure for choosing the raters produced a somewhat diverse population.

Procedure

General education classroom teachers ($N = 30$) rated 121 students without identified disabilities. The teachers were instructed to choose two English-speaking only students and two LEP students who were not experiencing academic failure in their classroom. Each teacher was encouraged to choose students based on their professional knowledge of the students' academic behaviors. The students had not been referred to or previously served in special education. Sixty students were identified as English-speaking only and 61 were identified as LEP. The teachers then completed a LDDI protocol on each of their four students. The teacher raters also completed a

demographic data sheet, which indicated the student's age, grade, ethnicity, home language, the lack of an identified disability, and their LEP status. External evaluators/data collectors then scored the LDDI protocols.

Results

The data analysis included the use of two statistical procedures. Table 1 presents the results of the t-test analysis. Independent t-tests were used to compare the pooled data from the LEP and English-only speaking students on all six scales. The results of the t-test analysis indicate significant differences between the two groups for all subtests on the LDDI. Significance at the .0001 level of confidence was reported for all scales with the exception of the writing subtest (.002 level of confidence). The effect size for all subgroups was calculated. Kirk (1995) states that effect size over .40 indicates a large effect size. All of the values exceed the .40 standard for a large effect size.

Table 1
Mean LDDI Stanine Score by Subtests According to Teacher Ratings

Subtest	Language Group English only (N = 60)	LEP (N = 61)	t	Effect Size
Listening	8.000 (1.426)	6.115 (2.130)	5.711**	-1.32
Speaking	8.333 (1.336)	6.590 (1.970)	5.688**	-1.31
Reading	8.300 (1.266)	6.656 2.136	5.140**	-1.30
Writing	7.833 (1.689)	6.754 (2.087)	3.124*	-0.639
Mathematics	8.083 (1.453)	6.590 (2.369)	4.675**	-1.03
Reasoning	8.417 (1.279)	7.23 (2.217)	3.600**	-0.093

Note. Standard deviation appears in parentheses.

* $p < .002$, ** $p < .001$

A Pearson chi-square analysis was undertaken to examine the frequency of the number of students identified by the LDDI as having intrinsic processing difficulties. Table 2 presents the results of the Pearson chi-square analysis.

The Pearson chi-square indicated that students who were LEP and not currently being served as students with learning disabilities were identified as having intrinsic processing disorders almost twice as often as English-only speaking students not currently identified as learning disabled. The Pearson chi-square was significant at the .05 level.

Table 2

Frequency of Identification of Intrinsic Processing Disorders by Group

	English-only	LEP	Total
Positively identified	9.92	18.18	28.10
Undecided	3.31	6.61	9.92
Not identified	36.36	25.62	61.98
Total	49.59	50.41	100.00

Note. $X^2(2, N = 121) = 6.5$

$p < .05$

Discussion

The results of this study indicate significant differences in the scores of LEP students and English-only speaking students without identified disabilities on all scales of the LDDI. LEP students without disabilities were more frequently identified as having possible intrinsic processing disorders using the LDDI. However, school records and current performance are not indicative of these students experiencing academic difficulty or learning disabilities. The results support the conclusions of Ortiz and García (1995) that characteristics of second language learners and those of language disorders often mirror themselves.

The analysis indicates that use of the LDDI to help determine intrinsic processing disorders in LEP students without disabilities is inconclusive. Based on the results of this study, the identification of intrinsic processing disorders in students with LEP would not appear to be successfully accomplished through the use of the LDDI. Further research is needed to investigate methods for successfully identifying students with learning disabilities that are LEP.

Educational Implications

Need for appropriate assessment techniques and instruments

The apparent success of the LDDI in screening non-LEP students as learners without learning disabilities, points to the need for an instrument to screen LEP students in this manner.

On the surface, one could assume that the LDDI, as an assessment instrument, is inappropriate for use with this population. Upon closer examination of individual student protocols, additional factors that affected the results on the rating scales were discovered. These factors have definite implications for the preparation of teacher raters who assess students with LEP and for the actual assessment process for LEP students referred to special education.

The first area of concern involves the teacher raters' role in the assessment process. The following issues were identified in the informal examination of the scored protocols:

1. Consistent bottom rankings on the language-related behaviors indicated that the teacher raters appeared to lack an understanding of basic language acquisition processes.
2. Overall low scores revealed that the teacher raters may have been unaware of hidden biases toward learners that are LEP.
3. Patterns on the LDDI ratings disclosed that the teacher raters may have lacked an understanding of basic intrinsic processing problems and how they manifest themselves in second language learners.

Need for appropriate training

The second area of concern about the use of the LDDI with LEP students lies in the actual assessment process for students with special needs. The concerns include the following:

1. Results suggest that the LDDI would be inappropriate for use as an instrument for assessing LEP students without first acknowledging the student's cultural differences and language acquisition background.
2. Extreme caution should be used when interpreting the LDDI for students who are LEP. Several assessment devices should be used in order to confirm a diagnosis of learning disabilities.
3. Teacher raters' rankings on these LDDIs indicate that without prior knowledge of an LEP student's language proficiency, a teacher/rater may inaccurately diagnosis extrinsic processing factors as intrinsic processing disorders.
4. Outcomes of the LDDI analysis indicate that teacher raters did not differentiate language acquisition from indicators typically profiled on students with learning disabilities. Due to this dearth of understanding, teacher/raters must be trained in interpretation of language acquisition results as it impacts native language and the acquisition of English.

Limitations of the Study

Several limitations were identified in this study. Larger sample sizes are necessary in order to draw conclusive evidence regarding the efficacy of using this instrument with LEP populations. Secondly, while teacher reports

indicated students' academic success in the classroom, there is a possibility that some of the sample actually had a learning disability that had not yet affected their academic performance. Additionally, academic failure in younger members of the LEP sample, which might later lead to the diagnosis of a learning disability, may have gone undetected.

Further Research

Additional studies that compare the results of LEP with learning disabilities and those who are not identified as having a learning disability may provide additional insight into the validity of using the LDDI with this population. Replication of this study after the teacher raters have been trained in LEP evaluation techniques is also a viable undertaking. Finally, comparing the results of the LDDI with those of another instrument that purports to identify learning disabilities such as the Woodcock Johnson Tests of Achievement-R and the Bateria-R in both the Spanish and English versions might also clarify the assessment results.

Summary

Unraveling the intricate problem of diagnosing learning disabilities within the population of LEP students is complex. This study addressed the use of the LDDI as a diagnostic tool in the assessment process for students who are second language learners. Results indicated that the LDDI over-identified intrinsic processing disorders in this non-disabled, LEP population. Further research is needed to determine the exact impact of acquiring a new language and its relationship to the false appearance of learning disabilities. Methods for identifying intrinsic processing disorders in persons who are LEP will also require further investigation. Furthermore, the study has strong implications regarding teacher educator training for special education programs. The need for teachers and assessors to fully understand and account for the implications of second language acquisition in LEP is paramount for this growing population.

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