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Research Article

Speech-Language Pathologists' Clinical Decision Making for Children With Specific Language Impairment

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Purpose: The speech-language pathologist's (SLP's) role for the specific language impairment (SLI) population is to provide specialized intervention targeting underlying deficits. However, children with SLI are often underrepresented on caseloads despite a high prevalence of the disorder and known long-term impacts. This study explored how SLPs use research to inform clinical decision making for SLI under neutral workplace circumstances.
Method: A national web-based survey was distributed to SLPs (n = 563) to investigate assessment and intervention clinical decision making for individuals with SLI. Vignettes portrayed various clinical profiles of SLI across dimensions of affectedness (child characteristics). Respondents made clinical decisions under neutral workplace conditions to remove confounds of work setting, policies, and caseload/time management constraints. The influence of child and practitioner characteristics on clinical decision making was explored.
Results: Variation across the vignettes emerged for the clinical decisions of SLP service recommendation, service delivery, intervention contents, specific treatment goals, and a monitoring approach. Practitioner characteristics had little influence, while child characteristics influenced responses across the clinical decision-making process. Assessment standard scores and percentiles were most strongly associated with SLP service recommendation.
Conclusion: The use of vignette methodology was demonstrated for the discipline of communication sciences and disorders. SLPs recommended services for individuals with SLI at higher rates than in actual practice; however, variation across the clinical decision-making process occurred. Implications include the reduction and removal of constraining workplace characteristics and increasing SLP competency for identifying the diagnostic profile of SLI.

Language impairments (LIs) in children can occur in the absence of or concomitantly with other developmental disabilities (Redmond, Thompson, & Goldstein, 2011). In this article, we focus on the former group, often referred to as children with specific language impairment (SLI). Children with SLI comprise approximately 7% of the general population but are consistently underrepresented on clinical caseloads despite known costs associated with lack of diagnosis and treatment (Johnson et al., 1999; Johnson, Beitchman, & Brownlie, 2010; Tomblin et al., 1997; Zhang & Tomblin, 2000). The potential functional impact of SLI is significant and carries a pervasive risk for academic and social difficulties from preschool through adulthood. Rice (2018) describes this phenomenon as a "thicket." Language is at the core with extending branches of related outcomes (e.g., academic risk, social acceptance, social anxiety), which may lead speech-language pathologists (SLPs) to misinterpret those related outcomes as the primary deficit.

SLPs have the critical role of intervening to improve the long-term functional impacts stemming from a lack of services for children with SLI. The SLP's role is ultimately to provide specialized and targeted intervention. However, many points of vulnerability exist throughout the clinical decision-making process. These vulnerabilities may be particularly sensitive to workplace policies mandating SLPs' practice and to workplace realities that constrain practice (e.g., caseload size, time). Ideally, if operating autonomously and without constraints, a referral source (e.g., teacher) brings a child with potential SLI to the attention of the SLP. Assessment then provides information essential to determining if a child is eligible for SLP services and informs service delivery selection (e.g., pull-out vs. push-in). The SLP determines language to be the primary area of need through

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high-stakes differential diagnosis. He or she also must consider the possibility of multiple impairments with the risk of missed diagnosis or misdiagnosis (Redmond et al., 2011). Then, the SLP identifies relevant specific treatment goals, targeting underlying deficits and also addressing secondary functional impacts. Each clinical decision step relies on the SLP's competency and practice patterns. Inaccuracy at any level risks leaving an individual with SLI vulnerable to lack of or less effective services.

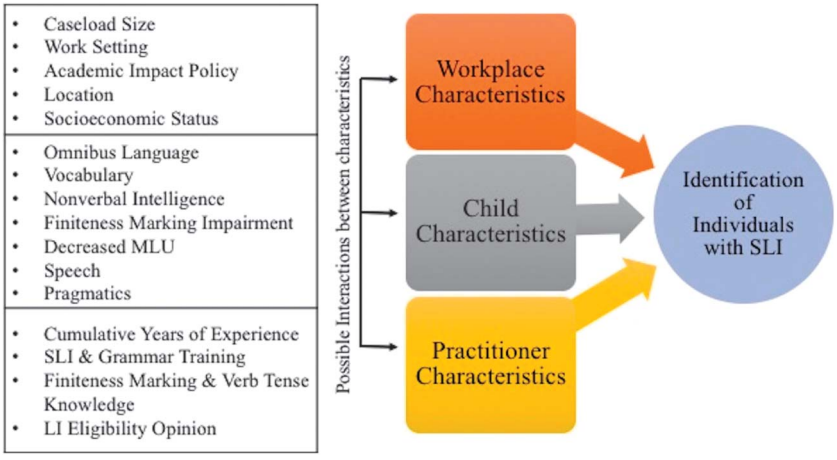
As part of a larger research framework, we aim to explore how SLPs' competency and practice patterns influence their clinical decision making for the SLI population. An extant research literature pertaining to SLI provides SLPs with a wealth of information including theoretical models of underlying deficits, longitudinal persistence, significant long-term outcomes associated with the disorder, assessment practices, differential diagnosis, and intervention practices. The point of interest for this study is: Do SLPs use this research base to inform their clinical decision making under ideal circumstances? We used a method relatively novel to the communication sciences and disorders discipline —vignettes—to investigate these constructs under neutral workplace circumstances (e.g., without reference to federal and local policies for special education service eligibility or caseload and time management constraints) and across work settings. Figure 1 depicts the overall conceptual framework. Based on the research literature, we included three key constructs: workplace characteristics including work setting, policies, and available resources (not reported here); child characteristics at the level of differentiated speech and linguistic abilities; and practitioner characteristics including years of experience and knowledge of child language features.

Vignette Methodology

As Peabody, Luck, Glassman, Dresselhaus, and Lee (2000) reviewed, quality of care measurement considers both clinical competency and practice patterns. One commonly used method is measuring health outcomes—number of patients diagnosed, treated, and so forth. While informative, this outcome measurement alone inadvertently includes confounding factors outside the control of the practitioner, masking their true level of competency and the effectiveness of their practice patterns. These confounds include patient characteristics (e.g., comorbidity of disorders, socioeconomic impacts on health) and structural effects (e.g., organizational policies). Another approach is to investigate clinical processes (e.g., decision making). Peabody et al. revealed that vignettes provide an alternative to standardized patients and chart abstraction that is valid and comprehensive. Vignettes can also investigate the effects of respondent knowledge rather than the impact of structural effects layered onto clinical practice. Stakeholders can implement vignettes frequently and measure postintervention change (e.g., a new policy implementation). Importantly, vignettes can illuminate breakdowns in care due to lack of competency or ineffective clinical practices. A professional field can then design targeted organizational interventions aimed at improving care widespread.

In the speech-language pathology literature, Records and Tomblin's (1994) investigation of how SLPs diagnose LI is a relevant example. The authors presented case profiles to practicing SLPs composed of standardized assessment information in a bulleted list. Results revealed that the sample agreed on language status at greater than chance level. However, only 17% of the cases had unanimous agreement, and those tended to be at the end points of the language distribution (i.e., significantly below average or above average). Raters also reported increased confidence in determining typical status rather than LI. A relationship between standard scores and a diagnosis appeared; the likelihood of an LI designation shifted at 1 *SD* below average. Clinicians used test scores to inform their decision, and one score influenced the interpretation of others. Raters used the

Figure 1. Conceptual framework for survey of reported clinical practice and vignettes. During report of clinical practice, the influence of workplace and practitioner characteristics was investigated; during vignettes, the influence of practitioner and child characteristics was investigated. SLI = specific language impairment; MLU = mean length of utterance.



discrepancy model such that identification of LI increased when the nonverbal intelligence quotient (NVIQ) score was within the normal range. The results pointed to child characteristics that may influence identification rate (i.e., severity of language standard scores, NVIQ information). However, these case profiles did not address how SLPs interpret functional impacts, clinical symptoms, workplace characteristics, practitioner characteristics, or the entire decision-making process.

Diagnostic Criteria for SLI

We used vignettes in the current study to explore how SLPs use research to inform their clinical decision making. Therefore, we use research-based diagnostic criteria in the vignettes rather than a representation of diagnostic labels or criteria used in actual practice. The operational definition for SLI in this study is as follows: performance 1 or more *SD*s below the mean on an omnibus language assessment (i.e., Test of Language Development–Primary: Fourth Edition [TOLD-P:4; Newcomer & Hammill, 2008]; Clinical Evaluation of Language Fundamentals–Fourth Edition [CELF-4; Semel, Wiig, & Secord, 2003]), adequate nonverbal intelligence, and finiteness marking impairment (discussed further below). The level of −1 *SD* below the mean is consistent with two sources of evidence.

First, Tomblin, Records, and Zhang (1996) documented that a cutoff score of −1.14 *SD*s below the age-level mean is sufficient based on the EpiSLI diagnostic system. This level is often confused with the −1.25 reported in the full report of the EpiSLI study outcomes (Tomblin et al., 1997). The −1.25 definition is based on a multivariate diagnostic system including five composites: vocabulary, grammar, narration, comprehension, and production based on the TOLD and a narrative task. The −1.14 *SD*s is from a univariate composite of the full diagnostic array. In other words, the −1.14 is a reasonable approximation for the more time-consuming full battery of the TOLD plus the narrative task. Further, it is consistent with the finding that −1 *SD* below the mean is benchmarked to clinical judgments (Records & Tomblin, 1994). Note that the standard scores for the TOLD, as for many other tests, are calculated with a mean of 100 standard score points and a standard deviation of 15 points. A definition of SLI set at −1 *SD* corresponds to a standard score of 85. The standard error of measurement for the TOLD composites is 3 or 5 points, depending on the measure. Thus, a "true" score for a standard score of 85 lies between 82 and 88 or 81 and 89. This variation is within the window of −1 and −1.14 *SD*s below the mean, suggesting little if any functional difference between the two levels.

The second source of evidence for the validity of the criterion of −1 *SD* below the mean is whether this level consistently differentiates affected from unaffected children over time across a variety of language measures. Note that, if the criterion is not valid, such group differences would be more likely to weaken or disappear over time. However, this criterion at the outset of long-term longitudinal studies shows consistent differentiation of affected versus unaffected children on various individual dimensions of language, which continues from preschool through adolescence (Rice, 2013; Rice & Hoffman, 2015; Rice et al., 2010; Rice, Wexler, & Hershberger, 1998). Group differences are evident for vocabulary and mean length of utterance (MLU) and even more so for finiteness marking.

Finally, outside the operational definition of SLI, but relevant for the research questions, are functional impacts and secondary symptoms. To investigate influences on SLPs' clinical decisions, we manipulated the presence, absence, and severity level of the various research-based diagnostic criteria including functional impacts and secondary symptoms. The functional impacts included social symptoms such as shyness. For example, an affectedness criterion of −1 *SD* below the mean on omnibus language assessments detects social consequences in friendships for preschool children with SLI, who are less likely to be named as friends than their unaffected peers (Gertner, Rice, & Hadley, 1994).

Removal of Confounding Factors

The underrepresentation of individuals with SLI on clinical caseloads is likely multifactorial. We aim to differentiate SLPs' competency and practice patterns from other confounding factors that influence clinical decision making. First, the likelihood of referral sources recognizing language-based deficits as requiring speech-language pathology services is largely out of the SLP's control. However, it influences the extent to which individuals with SLI will comprise their caseloads. The vignettes removed the referral mechanism from the clinical decision-making process. Second, SLPs' assessment can deviate from evidence-based practice (e.g., assessment selection; Betz, Eickhoff, & Sullivan, 2013). To remove this confound, the vignettes provided the SLPs with diagnostic information to isolate clinical decision making to diagnostic interpretation. Third, workplace characteristics (e.g., policies) influence clinical decision making (Fulcher-Rood, Castilla-Earls, & Higginbotham, 2018). For example, school-based eligibility decisions differ from research-based criteria and clinic-based SLPs operating within the medical model. School-based SLPs must make clinical decisions based on federal and state education law. Per the Individuals with Disabilities Education Act (IDEA, 2004; Hoffman, Ireland, Hall-Mills, & Flynn, 2013), school-based SLPs, as part of the Individualized Education Program (IEP) team, must determine (a) whether an impairment exists, (b) whether that impairment meets the threshold of disability per federal and state criteria (i.e., academic impact), (c) whether the disability requires specialized services, and (d) what special education or related services are necessary for participation in the general education curriculum. In addition, school-based SLPs are not autonomous in decision making as they are a part of an educational team for eligibility determination and overall IEP design (e.g., goal selection). However, only a third of school-based SLPs report feeling prepared to lead these teams (American Speech-Language-Hearing Association [ASHA], 2017), thereby placing students with SLI at risk

for inadequate IEPs for language-based services. The vignette instructions explicitly directed the respondents to disregard all workplace characteristics to remove these additional confounds. Therefore, any identified competency deficiencies or best practice deviations can directly inform the field as to how to improve quality of care.

Potential Child Characteristic Influences

Standard Scores: Omnibus Language, Vocabulary, and NVIQ

Research-based diagnostic criteria for SLI include standard scores more than 1 *SD* below the age mean on an omnibus language assessment and nonverbal intelligence assessment scores within the typical range. Diagnostic criteria differ in actual clinical practice, however. State departments of education may require specific standard score or percentile cutoffs or require cognitive referencing. For example, the state of Missouri requires that school-aged children perform 1.5 *SD*s below their cognitive ability on two norm-referenced language assessments for eligibility (Missouri Office of Special Education Compliance Standards & Indicators, 2012). In structured open interviews with SLPs, Fulcher-Rood et al. (2018) confirmed that federal, state, and local workplace policies greatly inform diagnostic decision making for LIs. Betz et al. (2013) revealed that (predominantly school-based) SLPs use omnibus language and vocabulary measures most often when assessing individuals who potentially have SLI. Selection of assessment measures was correlated with the publication date rather than reliability, validity, sensitivity, or specificity. When administering domain-specific tests, vocabulary tests were reported more often than morphosyntax, which is problematic as vocabulary tests have poor diagnostic accuracy (Gray, Plante, Vance, & Henrichsen, 1999; Spaulding, Plante, & Farinella, 2006) and morphosyntactic impairment is a known hallmark for individuals with SLI (Rice, Wexler, & Cleave, 1995; Tager-Flusberg & Cooper, 1999). Thus, SLPs may make eligibility determinations based on standard scores of assessments lacking key psychometric properties, potentially identifying only those with more severe SLI. The study presented here will be the first to investigate how SLPs consider standard scores versus inclusionary criteria (i.e., finiteness marking impairment) throughout the clinical decision-making process without the confounds of workplace characteristics.

Clinical Symptoms and Functionality: Finiteness, MLU, Speech, and Pragmatics

Expanding upon Rice's (2018) "thicket" metaphor, SLPs are presented with clinical profiles containing a thicket of various symptoms and functional impacts, some primary (e.g., finiteness marking impairment, decreased MLU) and others secondary to the underlying deficit of language (e.g., social awkwardness). The extent to which SLPs identify clinical symptoms associated with SLI as primary deficits and how that informs clinical decision making is unclear. Perhaps, the secondary functional impacts—the branches of the thicket—are more salient and may mask the core underlying deficits of SLI.

The clinical profile of SLI includes a known clinical morphosyntactic marker, a tendency to omit finiteness markers on verbs (Rice et al., 1995; Tager-Flusberg & Cooper, 1999) and decreased MLU (Rice et al., 2010). Given the documentation of SLPs' diagnostic practices, there is reason to believe these dimensions of affectedness may be overlooked. SLPs overrely on standardized testing and rarely administer morphosyntactic assessments (Betz et al., 2013; Fulcher-Rood et al., 2018). Pavelko, Owens, Ireland, and Hahs-Vaughn (2016) found that approximately one third of school-based SLPs may not use language sampling analysis. Barriers included time, limited training, and limited expertise. When SLPs did use language sampling analysis, the authors reported deviations from evidence-based practice. Thus, limited opportunities for SLPs for identifying finiteness marking impairment and decreased MLU lead to inadequate assessment selection or lack of language sample analysis data. Additionally, all children progress through a developmental period of optional use of finiteness marking and emerging MLU, while children with SLI have an extended period of this developmental stage (Rice et al., 1995). Because all children experience this phenomenon, practitioners may view the extended period associated with SLI as immaturity rather than impairment.

Alternatively, Zhang and Tomblin (2000) revealed an association between overt symptoms and an increased likelihood of intervention receipt. Specifically, children with an LI only were less likely to be receiving speech-language pathology services than children with an isolated or concomitant speech sound disorder. However, language rather than speech was linked to later academic and social functioning in second grade. Redmond, Ash, and Hogan (2015) found a protective factor for individuals with SLI who had concurrent attention-deficit/hyperactivity disorder, suggesting the more salient behavioral symptoms of attention-deficit/hyperactivity disorder led to higher rates of referral and service provision than SLI alone. Other overt symptoms may include accompanying pragmatic behaviors (e.g., interruptions, turn-taking). A comparison of SLI with and without pragmatic behaviors for likelihood of identification for clinical services could not be identified. However, Redmond and Rice (1998) revealed that children with SLI may appear to have social deficits, although likely due to limited language competence rather than social deviance. Teacher reports of social problems and internalizing behavior ratings increase for individuals with SLI as compared to age-matched peers, whereas parents do not report social problems or internalizing behavior differences. This difference in rater judgment suggests situational effects instead of emotional trait differences evident across settings.

Research has shown that listeners, including teachers and SLPs, are sensitive to communication differences in young children. Adult raters showed negative biases related to the child's intelligence and social maturity from

presented language samples (DeThorne & Watkins, 2001; Rice, Hadley, & Alexander, 1993). Ratings were lower for children with concomitant speech impairment. Possibly, the more overt symptoms of speech and pragmatic impairments may initiate more referrals to the SLP. Alternatively, the evaluating SLP may be more sensitive to these overt clinical presentations within evaluations. Children with SLI and overt concomitant speech or pragmatic symptoms may be identified at higher rates but then be provided intervention with a reduced focus on language. The vignettes used in this study will be the first to address this possibility. We investigated clinical decision making relative to the overtness of symptoms in the absence of confounding workplace characteristics.

Potential Practitioner Characteristic Influences

Cumulative Years of Experience

Studies investigating the impact of cumulative years of experience on reported clinical practice have revealed inconsistent findings. Zipoli and Kennedy (2005) found that, in related health fields, practitioners with fewer years of experience had more positive attitudes toward evidence-based practice. SLPs had positive attitudes, but cumulative years of experience did not have an impact. Cumulative years of experience may influence service delivery (Brandel & Loeb, 2011), but Caesar and Kohler (2007) did not find an effect on use of recommended assessment practices for bilingual children. Findings from intervention outcome research revealed an influence on whether SLPs targeted literacy (Tambyraja, Schmitt, Justice, Logan, & Schwarz, 2014), but years of experience did not influence overall SLP effectiveness (Farquharson, Tambyraja, Logan, Justice, & Schmitt, 2015). Intuitively, cumulative years of experience may positively impact clinical decision making as SLPs refine and expand their knowledge and skills. Alternatively, it may have a negative impact as SLPs become more comfortable and less flexible with their preferred practice patterns. Influences of cumulative years of experience across the clinical decision-making process for the SLI population are unknown.

SLI and Grammar Training

Whether SLPs feel they have sufficient training to work with individuals who have SLI and with grammar is unknown. Schwartz and Drager (2008) revealed that SLPs feel underprepared to work with specialized populations (e.g., traumatic brain injury), although the SLI population was not included in the study. Brimo and Melamed (2017) investigated undergraduate SLP students' explicit syntax knowledge and application to error analysis following a language development course. Results suggested that this coursework may not provide enough direct instruction on language structure. Report of perceived level of training in SLI and grammar may impact clinical decision making regarding the research-based SLI diagnostic criteria.

Finiteness marking and verb tense knowledge. This literature review identified no studies addressing whether SLPs have sufficient finiteness marking and verb tense knowledge nor their effect on clinical practice. Finiteness marking knowledge and verb tense knowledge may influence SLPs' ability to readily identify individuals at risk for SLI based on research-based diagnostic criteria. As noted earlier, finiteness marking is a hallmark characteristic of the SLI diagnosis (Rice et al., 1995; Tager-Flusberg & Cooper, 1999). Although finiteness marking frequently appears as a morphemic affix at the surface, it is a sentence-level syntactic feature with specific linguistic properties. For example, the following sentences include the morphemes *–ed* or *–s*; however, only in Example (1) do they function to mark finiteness:

(1) a. She walked the white animal.
    b. She walks the white animal.
(2) a. The walked animal was white.
    b. The walked animal is white.

A test for locating finiteness in sentences is where tense and agreement appear. For Example (2), shifting to present tense yields "the walked animal is white," showing that the copula BE carries finiteness in the sentence and "walked" is a nonfinite adjectival participle. Finiteness marking can appear as an irregular form with vowel alternation (e.g., *run* → *ran*) or as a frozen form (e.g., *put* is a verb with no overt past tense morphology). SLPs can use finiteness marking performance for determining whether diagnostic criteria for SLI have been met or for creating specific treatment goals. However, it is unclear whether SLPs appreciate this underlying deficit in actual practice. In the questionnaire used in this study, we intentionally separated the constructs of finiteness marking and verb tense use. We hypothesized that SLPs who demonstrated finiteness marking knowledge (above and beyond verb tense knowledge) may have increased research literacy impacting their competency, practice patterns, and clinical decision making.

LI Eligibility Opinion

As noted above, workplace characteristics have policies and guidelines that inform clinical decision making for eligibility determination (e.g., Fulcher-Rood et al., 2018; IDEA, 2004). How SLPs' opinions and beliefs align or differ from those workplace characteristics is unknown. However, research shows that one's attitudes and beliefs can influence practice patterns. Kritikos (2003) investigated beliefs involved with bilingual language assessments based on SLPs' previous experiences. The author concluded that experience with a particular population may influence one's beliefs including how much clinical significance an SLP places on various aspects of a child's clinical profile, the value they place on certain aspects of the assessment process, and their interpretation of assessments. It is unknown whether SLPs hold an opinion and belief that individuals with SLI should be eligible based solely on research-based diagnostic criteria nor how this informs their clinical decision making.

Aims

To gather needed descriptive information, our research questions were the following:

1. When provided with assessment information and clinical symptoms, what clinical decisions do SLPs make under neutral workplace circumstances?
2. What child and practitioner characteristics influence these decisions?

Method

Ethics

The University of Kansas Institutional Review Board approved this study. The survey collected no identifiable information, and the respondents did not receive incentives for participation.

Design, Development, and Implementation

The web-based questionnaire was designed to be descriptive and exploratory. It contained 97 questions and used adaptive questioning to reduce the number of items each respondent saw (e.g., the previously answered item determined the next question administered). The survey contained three major sections of questions: (a) respondent demographics and characteristics, (b) reported workplace clinical characteristics, and (c) vignettes. The survey required answers for the demographic section, which the authors placed first given the de-identified nature of the survey. The demographic information allowed for calculation of attrition and comparison with ASHA membership demographics for representativeness considerations, regardless of respondents' completion status. Section 2 of the survey is beyond the scope of this report. Eleven certified SLPs completed pilot testing, reviewed the entire survey, and provided feedback. Redundant or confusing questions and items were removed or edited for clarity.

Survey items from Sections 1 and 2 provided information regarding respondents' practitioner characteristics; see Appendix for the questions and response options. Practitioner characteristic items included self-report for cumulative years of experience (Question [Q] 1), training related to SLI (Q9), and training related to grammar (Q10); selection of treatment objectives in actual practice for finiteness marking knowledge (Q7) and verb tense use knowledge (Q7); and response to the statement "Should all students with a language impairment (i.e., 1 standard deviation below average) be regarded as eligible for SLP services?" for LI eligibility opinion (Q8).

The vignettes represented various profiles of children with SLI. Table 1 outlines the systematically varied child characteristics: severity of the omnibus language and vocabulary standard score, the presence or absence of "within normal limits" (WNL) speech sound percentile, and the presence or absence of NVIQ standard score. The presence or absence of finiteness marking impairment, pragmatic impairment, and decreased MLU were presented as clinical symptoms and functional impacts (e.g., "S.C. demonstrated some difficultly with past tense [e.g., inconsistently producing "digged" for *dug* or "ride" for *rode*]"). Manipulating the presence and absence of these child characteristics allows for investigating whether or not they influenced clinical decision making. Thus, the vignettes did not always include the finiteness marking impairment, although that symptom is considered inclusionary for the research-based diagnostic criteria of SLI. Each of these dimensions of affectedness represented a child characteristic. We expected correspondence between the clinical decisions and the clinical symptoms. Of particular interest was finiteness marking impairment because it may not be as well recognized as a clinical marker. The dimensions were not fully crossed in the vignette design as that would generate too large of an item pool for within-person analysis. Instead, some dimensions were not specified in some vignettes, revealing respondent assumptions and default decision making.

Instructions specifically requested that respondents disregard their workplace setting, policies, and caseload and time management constraints, thus relying solely on clinical competency and practice patterns for decision making. Similar to actual clinical practice, we provided no information regarding clinical status or whether the child had a diagnosis of SLI. Paragraph descriptions based on child characteristics provided diagnostic information. Omnibus language standard scores came from the TOLD-P:4 (Newcomer & Hammill, 2008) or the CELF-4 (Semel et al., 2003); vocabulary standard scores, from the Peabody Picture Vocabulary Test–Fourth Edition (Dunn & Dunn, 2007); speech sound percentiles, from the Goldman-Fristoe Test of Articulation–Second Edition (Goldman & Fristoe, 2000); and nonverbal intelligence standard scores, from the Wechsler Intelligence Scales for Children–Fifth Edition (Wechsler, 2014) or the Columbia Mental Maturity Scales (Burgemeister, Blum, & Lorge, 1954). These assessments were selected given their use in the research literature for documenting SLI diagnostic criteria.

Respondents did not report a diagnostic label. Instead, they made clinical judgments regarding (a) eligibility for (continued) SLP services, (b) type of service delivery (i.e., direct, consultation, monitor, follow-up), (c) intervention content (i.e., speech, language, pragmatics, voice, fluency), (d) specific treatment goals, or (e) a monitoring approach. Presentation of questions was dependent on previous response. If a respondent selected "yes" to requiring clinical services, he or she was asked what type of service and intervention to provide; if a respondent selected "no," he or she was asked whether monitoring that child was appropriate. For each question, instructions requested that respondents select all that apply from the provided response options. An open free-text option was included to capture unanticipated responses.

Recruitment

SLPs working with children in the United States across various work settings were the target sample for

Table 1. Systematic manipulation of specific language impairment clinical profiles.

Dimensions of potential affectedness		Vignettes					
		A	B	C	D	E	F
Standard scores	Omnibus language	Impaired	Borderline	Impaired	Impaired	Borderline	Borderline
	Vocabulary	Impaired	Borderline	Impaired	Impaired	Borderline	NM
	Nonverbal IQ	NM	NM	NM	WNL	NM	WNL
Clinical symptoms and functionality	Finiteness	Impaired	Impaired	NM	Impaired	NM	NM
	MLU	Impaired	Impaired	NM	NM	Impaired	NM
	Speech	WNL	NM	WNL	NM	NM	NM
	Pragmatics	NM	NM	Impaired	NM	Impaired	NM

Note. Systematic variation of child characteristics across vignettes; impaired, standard scores < 78; borderline: standard scores of 83–85; standard scores > 100 for nonverbal intelligence quotient (IQ); percentiles > 33rd for speech. NM = symptom not mentioned in the vignette; WNL = within normal limits; MLU = mean length of utterance.

the study. Recruitment was completed via the ASHA Special Interest Group (SIG) 1: Language Learning and Education, ASHA SIG 16: School-Based Issues, and state speech-language-hearing association organizations. Thirty of the 51 state organizations from a variety of geographic regions agreed to participate and distribute the survey to their members. The survey did not seek information regarding the respondents' residency in order to protect their privacy. Due to the de-identified nature of the survey, sending reminders to individual respondents to support survey completion was not possible. For recruitment through the ASHA SIGs, a second post was made 3 weeks after the original, with a final post a month later.

Data Analysis

When analyzing differences across the vignettes for the recommendation for (continued) SLP services, a Cochran's *Q* test was used due to the within-person design of the vignettes. Unlike chi-square tests, this nonparametric test assumes that the independent variable (i.e., the response to the vignettes) is related and not independent. Chi-square tests were used when the assumption of independence was met, specifically when exploring how practitioner and child characteristics influenced recommendation rates. Interpretations of the Cramer's *V* effect sizes are considered large for greater than .5, medium for .3–.5, and small for .1–.3 (Cohen, 1988). Descriptives and Spearman rho correlation analyses were also used. Due to the large number of analyses, a p value of < .01 was selected a priori and effect sizes were considered. Any incomplete surveys were included in the results, and list-wise deletion occurred.

Results

Participants

The demographics of the respondents were representative of ASHA (2017) across a variety of work settings, as shown in Table 2. Five hundred sixty-three (n = 563) respondents started the survey with an overall 42% dropout rate such that 351 participants started the vignettes and 326 completed the entire survey. Respondents without ASHA certification had a dropout rate of 78% compared to 24% with ASHA certification. Visual inspection of the data revealed no other variables that may have influenced attrition. The largest attrition occurred before completing Vignette A. It is unclear whether the design of the questionnaire (e.g., length), the clinical complexity of the vignettes, or a combination of the two contributed to the higher dropout rate before the vignettes.

Clinical Decision Making

In actual clinical practice, SLPs make a series of decisions. The vignette questions and responses mirror these decisions but under neutral workplace circumstances. Respondents could choose among the following for each vignette: recommendation for (continued) SLP services, selection of service delivery, determination of intervention content(s), and identification of specific treatment objectives. If respondents did not recommend SLP services, they could indicate a monitoring approach. In the results that follow, the variation of clinical decisions across the six differing clinical profiles of the vignettes was the primary outcome of interest for this study. See Table 3 for the clinical decisions across vignettes.

Recommendation for Services

As seen in the first row of Table 3, respondents recommended Vignettes A (89.81%), C (98.77%), and D (85.33%) significantly more often for (continued) SLP services than Vignettes B (25.00%), E (36.11%), and F(50.31%), $\chi^2(5) = 704.81$, $p < .001$, $\eta_Q^2 = .544$.

Service Delivery

As seen in the second section of Table 3, for respondents who selected "yes" to the recommendation for (continued) SLP services, respondents selected "pull-out" more often for A, C, and D; "push-in" for C, E, and F; "teacher consultation" for B and E; and "other: service delivery" for D. Although selected often, "parent consultation" did not seem to vary.

Table 2. Participant demographics and participant characteristics.

Demographics			Practitioner characteristics					
Variable	***n***	**%**	**Variable**	***n***	**%**	**Variable**	***n***	**%**
Gender			Cumulative years of experience			Academic impact (clinical opinion)		
Female	342	97.44	< 5	64	18.23	Yes	104	29.63
Male	9	2.56	6–20	139	39.60	No	221	62.96
Race/ethnicity			21–35	100	28.49	Missing	26	7.41
Hispanic	6	1.71	35+	48	13.68			
American Indian/Eskimo	3	0.85	SLI training			Grammar training		
Asian Pacific Islander	1	0.28	Extremely well	62	17.66	Extremely well	61	17.38
Black/African American	8	2.28	Very well	161	45.87	Very well	127	36.18
White/Caucasian	335	95.44	Moderately well	92	26.21	Moderately well	111	31.62
Other	5	1.42	Slightly well	7	1.99	Slightly well	23	6.55
Don't know	3	0.85	Not well	3	0.85	Not well	4	1.14
Certification			Missing	26	7.41	Missing	25	7.12
Yes	344	98.01	Finiteness knowledge			Verb tense		
No	7	1.99	Yes	26	7.41	Yes	314	89.46
Education level			No	325	92.59	No	37	10.54
Bachelor's	0	0.00						
Master's	335	95.44						
PhD	7	1.99						
SlpD	3	0.85						
EdD	6	1.71						
Work setting								
Medical	19	5.41						
Private practice	47	13.39						
School	285	81.20						

Note. $N = 351$. SLI = specific language impairment.

Table 3. Clinical choices per vignette: percentage of respondents selecting "yes."

Clinical decisions and response choices	Vignettes											
	A		B		C		D		E		F	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Recommendation for (continued) services	291	89.81	81	25.00	320	98.77	277	85.49	117	36.11	163	50.31
Type of service delivery												
Pull-out	239	82.13	38	46.91	292	91.25	235	84.84	34	29.06	88	53.99
Push-in	111	38.14	32	39.51	163	50.94	95	34.30	59	50.43	85	52.15
Teacher consultation	156	53.61	58	71.60	187	58.44	156	56.32	93	79.49	108	66.26
Parent consultation	115	39.52	35	43.21	130	40.63	117	42.24	53	45.30	54	33.13
Other: service delivery	13	4.47	5	6.17	11	3.44	7	2.53	14	11.97	9	5.52
Intervention content												
Speech	146	53.68	1	1.75	70	22.22	18	6.92	2	2.60	1	0.72
Language	267	98.16	57	100.00	300	95.24	259	99.62	39	50.65	138	99.28
Voice	12	4.41	0	0.00	0	0.00	0	0.00	0	0.00	1	0.72
Fluency	1	0.37	0	0.00	2	0.63	1	0.38	0	0.00	0	0.00
Pragmatics	38	13.97	0	0.00	250	79.37	2	0.77	67	87.01	8	5.76
Other: intervention content	5	1.84	0	0.00	5	1.59	7	2.69	1	1.30	6	4.32
Specific language goals												
Syntax development	178	66.67	42	73.68	111	37.00	175	67.57	13	33.33	35	25.36
Nonlinguistic cognition	7	2.62	0	0.00	40	13.33	5	1.93	2	5.13	22	15.94
Auditory processing	7	2.62	0	0.00	24	8.00	15	5.79	2	5.13	13	9.42
Sentence formulation	162	60.67	32	56.14	192	64.00	125	48.26	17	43.59	76	55.07
Vocabulary development	215	80.52	17	29.82	198	66.00	139	53.67	22	56.41	100	72.46
Listening comprehension	67	25.09	4	7.02	138	46.00	59	22.78	12	30.77	45	32.61
Narrative skills	68	25.47	12	21.05	201	67.00	47	18.15	20	51.28	64	46.38
Literacy	19	7.12	4	7.02	31	10.33	21	8.11	5	12.82	87	63.04
Morphology development	129	48.31	39	68.42	72	24.00	195	75.29	8	20.51	18	13.04
Other: language goal	23	8.61	5	8.77	63	21.00	19	7.34	9	23.08	6	4.35
Specific grammar goals												
Verb tense use	215	80.52	52	91.23	86	28.67	216	83.40	7	17.95	21	15.22
Verb vocabulary development	147	55.06	20	35.09	111	37.00	138	53.28	12	30.77	37	26.81
Complex sentence use	111	41.57	32	56.14	128	42.67	79	30.50	17	43.59	89	64.49
Pronoun use	44	16.48	43	75.44	59	19.67	54	20.85	3	7.69	9	6.52
Question formulation	61	22.85	6	10.53	163	54.33	50	19.31	18	46.15	38	27.54
Preposition use	40	14.98	6	10.53	40	13.33	40	15.44	2	5.13	9	6.52
Finiteness marking	9	3.37	3	5.26	16	5.33	23	8.88	0	0.00	4	2.90
Other: grammar goal	15	5.62	2	3.51	43	14.33	19	7.34	4	10.26	11	7.97
Specific pragmatic goals												
Eye contact	5	13.16	NA	NA	37	14.80	0	0.00	30	44.78	2	25.00
Avoidance of perseveration	1	2.63	NA	NA	44	17.60	1	50.00	8	11.94	0	0.00
Appropriate vocal volume	34	89.47	NA	NA	42	16.80	0	0.00	8	11.94	0	0.00
Initiating/maintaining conversation	19	50.00	NA	NA	229	91.60	1	50.00	57	85.07	8	100.00
Classroom functioning	8	21.05	NA	NA	102	40.80	2	100.00	28	41.79	4	50.00
Other: pragmatics	0	0.00	NA	NA	19	7.60	0	0.00	21	31.34	0	0.00
Monitoring selection												
Monitor	20	60.61	156	64.20	0	0.00	26	55.32	161	77.78	82	50.93
Follow-up	10	30.30	73	30.04	1	25.00	20	100.00	47	22.71	46	28.57
Other: monitoring approach	13	39.39	45	18.52	4	100.00	12	36.17	17	8.21	46	28.57

Note. NA = Not applicable. No participants selected pragmatics as an intervention content. Thus, no participants were presented with specific pragmatic goals to select.

Intervention Content

As seen in the third section of Table 3, respondents selected the "language" intervention content for A, B, C, D, and F 95% of the time or more, except for E 50.65% of the time. They selected the "pragmatic" intervention content more frequently for C and E and "speech" more frequently for A and C. Respondents rarely selected "voice," "other: intervention content," and "fluency" as intervention contents across all the vignettes.

Specific Treatment Goals

Respondents selected specific language and grammar treatment goals if they selected the "language" intervention content in the preceding question while they selected specific pragmatic treatment goals if they selected the "pragmatic" intervention content. The fourth, fifth, and sixth sections of Table 3 report the language-, grammar-, and pragmatic-specific treatment goals, respectively. Some treatment goals were selected at higher frequencies than others—"syntax development," "sentence formulation," "vocabulary

development," "narrative skills," "morphology development," "verb tense use," "verb vocabulary development," and "initiating and maintaining conversations." However, the selection rates varied across the vignettes. For Vignettes A, C, and D, respondents selected the treatment goals of "syntax development," "sentence formulation," "vocabulary development," "verb tense use," and "verb vocabulary development" frequently with low rates of pragmatic goal recommendations. Vignette C also received high rates for "narrative skills" and lower rates for "morphology development." This vignette received the highest recommendation rates for pragmatic treatment goals, especially for "initiating and maintaining conversation." Vignettes B and D rarely received a recommendation for language, grammar, or pragmatic treatment goals because it had low rates of recommendation for continued (SLP) services from the beginning of the clinical decision-making process. Respondents selected fewer treatment goals for F, with the most frequent selections for "sentence formulation," "vocabulary development," "literacy," and "complex sentence use."

Monitoring Approach

As seen in the final section of Table 3, for respondents who selected "no" to the recommendation for (continued) SLP services, they indicated "monitoring" most often for Vignettes B, E, and F.

Summary

Reported clinical decisions varied for all levels of the decision-making process. Earlier steps in the process have downstream effects such that Vignettes B and E, in particular, rarely received recommendations for treatment goals targeting the underlying deficits associated with the SLI research-based diagnostic profile (e.g., finiteness marking, morphology development).

The Influence of Child Characteristics

Refer to Table 1 for the systematic variations of child characteristics across the vignettes. Descriptive analyses compared omnibus language and vocabulary standard score severity (impaired, borderline, or not mentioned), the presence or absence of WNL NVIQ information, and the presence or absence of clinical symptoms and functionality (finiteness marking impairment, decreased MLU, speech, pragmatics). Clinical symptoms and functionality were presented as descriptions such that finiteness marking and decreased MLU represented primary underlying deficits associated with the SLI profile while pragmatics represented secondary functional impacts due to language deficits. Note that, when a secondary impact of speech was presented in a vignette, a WNL speech sound assessment percentile score was also present. Refer to Table 4 for the chi-square analyses of child and practitioner characteristic influences on the recommendation for (continued) SLP services. Tables 5 and 6 report percentages for the clinical decisions cross-tabulated with the child and practitioner characteristics. When the recommendation for (continued) SLP services' chi-square analysis was nonsignificant, we do not report on remaining clinical decisions in the text, but descriptives appear in Tables 5 and 6.

Omnibus Language and Vocabulary Standard Scores

As reported in Table 4, respondents recommended (continued) SLP services significantly more for vignettes with the omnibus language or vocabulary standard scores in the impaired range, $\chi^2(1) = 621.97$, $p < .001$, $V = .566$, and $\chi^2(2) = 658.66$, $p < .001$, $V = .582$, respectively, when compared to borderline scores or no information provided. See Table 5 for the remaining clinical decisions; the following results are laid out in the first column. For type of service delivery, analyses reveal that respondents selected "pull-out" service delivery markedly more often when standard scores were in the impaired range. Respondents also selected "push-in," "teacher consultation," and "parent consultation" more often with impaired standard scores. For intervention content, "language" was selected more frequently, again, by a large margin as compared to borderline scores or no information provided. Respondents also selected the "speech" intervention content more frequently with impaired omnibus language and vocabulary standard scores, which was unexpected given the WNL speech sound percentile score also included in the vignette description. For specific treatment goals, respondents identified "syntax development," "morphology development," "verb tense use," "verb vocabulary development," and "eye contact" for the vignettes with impaired omnibus language standard scores. They identified "literacy" as a treatment goal less frequently. Selection of specific treatment goals did not reveal a specific or expected pattern based on the presence or severity level of the vocabulary standard scores. Respondents selected some treatment goals more often for impaired standard scores while selecting others more often for borderline standard scores or for no provided standard score information. In line with previous literature, the child characteristic of the omnibus language standard score severity drives clinical decision making in expected ways.

NVIQ Standard Score

As seen in Table 4, WNL NVIQ standard scores had no influence on recommendation rate for (continued) SLP services, $\chi^2(1) = 5.65$, $p = .018$, $V = .054$.

Finiteness Marking Impairment

As seen in Table 4, the child characteristic of finiteness marking impairment had no significant influence on the recommendation for (continued) SLP services, $\chi^2(1) = 5.38$, $p = .020$, $V = .053$. Although this finding is nonsignificant according to our a priori criterion of $p < .01$, we report the remaining clinical decisions due to a priori interest in the influence of the finiteness marking impairment clinical symptom. When vignettes contained finiteness impairment symptoms, respondents selected "pull-out" service delivery more frequently (see Table 5), but not as markedly as the omnibus language and vocabulary standard score child characteristics. They selected "language" and "speech" more frequently

Table 4. The influence of child and practitioner characteristics on recommendation for continued (speech-language pathologist) services.

	Total: yes		Total: no					
Child characteristics	***n***	**%**	***n***	**%**	***df***	χ^2	***p***	***V***
Omnibus language					1	**621.97**	**< .001**	**0.566**
Impaired	888	45.68	84	4.32				
BL	361	18.57	611	31.43				
Vocabulary					2	**658.66**	**< .001**	**0.582**
Impaired	888	45.68	84	4.32				
BL	198	10.19	450	23.15				
NM	163	8.38	161	8.28				
NVIQ					1	5.65	0.018	0.054
WNL	440	22.63	208	10.70				
NM	809	41.62	487	25.05				
Finiteness marking impairment					1	5.38	0.020	0.053
Impaired	649	33.38	323	16.62				
NM	600	30.86	372	19.14				
MLU					1	**164.47**	**< .001**	**0.291**
Impaired	489	25.15	483	24.85				
WNL	760	39.09	212	10.91				
Speech					1	**381.90**	**< .001**	**0.443**
WNL	611	31.43	37	1.90				
NM	638	32.82	358	18.42				
Pragmatics					1	4.30	0.038	0.047
Impaired	437	22.48	211	10.85				
NM	812	41.77	484	24.90				
Cumulative years of experience					3	6.42	0.093	0.057
< 5	220	11.32	122	6.28				
6–20	493	25.36	299	15.38				
21–35	353	18.16	199	10.24				
35+	183	9.41	75	3.86				
Finiteness marking knowledge					1	9.06	0.002	0.068
Yes	105	5.40	1144	58.85				
No	33	1.70	662	34.05				
Verb tense knowledge					1	4.95	0.029	0.050
Yes	1125	57.87	124	6.38				
No	603	31.02	92	4.73				
LI eligibility opinion					1	**36.78**	**< .001**	**0.138**
Yes	461	23.71	774	39.81				
No	163	8.38	522	26.85				
Grammar training					4	13.53	0.009	0.084
Not well	13	0.67	11	0.57				
Slightly well	83	4.27	49	2.52				
Moderately well	391	20.11	263	13.53				
Very well	495	25.46	255	13.12				
Extremely well	257	13.22	109	5.61				

Note. BL = borderline standard score; NM = symptom not mentioned in the vignette; NVIQ = nonverbal intelligence quotient; WNL = within normal limits; MLU = mean length of utterance; LI = language impairment. Bolded items refer to statistically significant child and practitioner characteristic influences.

while selecting "pragmatics" less frequently than when this clinical symptom was absent from the vignette. Respondents selected the following treatment goals more frequently: "syntax development," "morphology development," "verb tense use," "verb vocabulary development," and "appropriate vocal volume." They selected "nonlinguistic cognition," "listening comprehension," "narrative skills literacy," "complex sentence use," "question formulation," "eye contact," "avoidance of perseveration," "initiating and maintaining conversation with peers," "classroom functioning," and "other: pragmatics" less frequently. Finiteness marking impairment had no influence on selecting a monitoring approach.

MLU

The results from the child characteristic of decreased MLU ran counter to expectations for most clinical decisions. As seen in Table 4, decreased MLU was associated with lower rates of recommendation for (continued) SLP services, $\chi^2(1) = 164.47$, $p < .001$, $V = .291$. They also recommended the selection of "pull-out," "push-in," "teacher consultation," and "parent consultation" service delivery models as well as the "language" and "pragmatic" intervention contents less frequently (see Table 5). Respondents recommended the following treatment goals more frequently: "syntax development," "verb tense use," "appropriate vocal volume," "eye contact," and "other: pragmatics." They

Table 5. Influence of child characteristics on clinical decisions (percentages).

	Omnibus language (*df* = 1)		Vocabulary (*df* = 2)			NVIQ (*df* = 1)		Finiteness marking impairment (*df* = 1)		Decreased MLU (*df* = 1)		Speech (*df* = 1)		Pragmatic (*df* = 1)	
Clinical decisions	**Imp**	**BL**	**Imp**	**BL**	**NM**	**WNL**	**NM**	**Imp**	**NM**	**Imp**	**NM**	**WNL**	**NM**	**Imp**	**NM**
Recommendation for (continued) services	**91.36**	**37.14**	**91.36**	**30.56**	**50.31**	67.9	62.42	66.77	61.73	**50.31**	**78.19**	**94.29**	**49.23**	67.44	62.65
Type of service delivery															
Pull-out	**78.89**	**16.46**	**78.89**	**11.11**	**27.16**	49.85	46.56	52.73	42.59	**32.03**	**63.27**	**82.07**	**30.48**	50.31	46.33
Push-in	**38.00**	**18.11**	**38.00**	**14.04**	**26.23**	27.78	28.19	24.51	31.58	**20.80**	**35.29**	**42.35**	**20.91**	34.26	24.94
Teacher consultation	**51.39**	**26.65**	**51.39**	**23.30**	**33.33**	40.74	38.15	38.11	39.92	**31.62**	**46.40**	**53.01**	**32.02**	43.21	36.91
Parent consultation	**37.28**	**14.61**	**37.28**	**13.58**	**16.67**	26.39	25.71	27.50	24.38	**20.91**	**30.97**	**37.87**	**19.98**	28.24	24.79
Other: service delivery	3.19	2.88	3.19	2.93	2.78	2.47	3.32	2.57	3.50	3.30	2.78	3.71	2.70	3.86	2.63
Intervention content															
Speech	**24.41**	**0.41**	**24.41**	**0.46**	**0.31**	3.24	16.99	17.30	7.51	15.45	9.36	**33.54**	**1.85**	11.11	13.05
Language	**88.77**	**29.94**	**88.77**	**20.22**	**49.38**	67.13	55.44	65.81	52.88	**42.74**	**75.93**	**90.73**	**43.67**	54.63	61.70
Voice	1.24	0.10	1.24	0.00	0.31	0.15	0.93	1.24	0.10	1.24	1.10	1.85	0.08	0.00	1.00
Fluency	0.47	0.00	0.47	0.00	0.00	0.25	0.42	0.34	0.38	0.25	0.42	0.51	0.19	0.51	0.27
Pragmatics	34.24	27.47	**34.24**	**50.00**	**5.76**	2.51	49.24	6.79	61.21	**25.86**	**36.41**	**49.05**	**14.45**	80.87	6.59
Other: intervention content	2.01	2.56	2.01	0.75	4.32	3.26	1.53	2.04	2.26	1.48	2.52	1.70	2.63	1.53	2.47
Specific language goals															
Syntax development	**56.72**	**38.79**	**56.72**	**57.89**	**25.55**	53.30	52.44	**68.22**	**33.76**	**64.72**	**46.52**	51.52	54.19	37.13	60.06
Nonlinguistic cognition	6.36	10.34	6.36	2.11	16.06	6.85	7.47	2.07	13.59	2.50	9.71	8.38	5.93	12.57	4.75
Auditory processing	5.62	6.47	5.62	2.11	9.49	7.11	5.03	3.80	8.28	2.50	7.54	5.53	6.13	7.78	4.89
Sentence formulation	58.56	53.88	58.56	51.58	55.47	51.02	61.43	55.09	60.51	58.61	56.96	**63.10**	**51.12**	62.57	55.17
Vocabulary development	67.48	59.91	**67.48**	**41.05**	**72.99**	60.66	68.90	64.08	67.94	70.56	63.33	**73.62**	**56.85**	65.87	65.78
Listening comprehension	32.27	26.29	32.27	16.84	32.85	26.40	33.69	22.45	41.40	**23.06**	**35.07**	36.54	24.52	44.91	24.44
Narrative skills	38.63	41.38	38.63	33.68	46.72	28.17	45.88	21.93	60.51	**27.78**	**45.22**	**47.95**	**29.24**	66.17	26.68
Literacy	**8.68**	**41.38**	**8.68**	**9.47**	**63.50**	27.41	8.99	7.60	26.11	**7.78**	**20.14**	**8.91**	**23.93**	10.78	18.30
Morphology development	**48.41**	**28.02**	**48.41**	**49.47**	**13.14**	54.06	37.80	**62.69**	**20.81**	48.89	41.30	**35.83**	**53.17**	23.95	53.21
Other: language goal	12.84	8.62	12.84	14.74	4.38	6.35	15.24	8.12	16.56	10.28	12.75	15.33	7.98	21.56	7.40
Specific grammar goals															
Verb tense use	**63.13**	**34.48**	**63.13**	**62.11**	**15.33**	60.15	54.79	**83.42**	**24.15**	**76.11**	**46.74**	53.56	60.53	27.76	70.39
Verb vocabulary development	**48.35**	**29.74**	**48.35**	**33.68**	**27.01**	44.42	44.14	**52.68**	**33.90**	49.72	41.39	45.91	42.33	36.72	47.77
Complex sentence use	**38.83**	**59.48**	**38.83**	**51.58**	**64.96**	42.64	43.84	38.34	49.58	44.44	42.84	42.53	44.38	43.28	43.44
Pronoun use	19.17	23.71	**19.17**	**48.42**	**6.57**	15.99	22.68	24.35	15.04	25.00	17.66	18.33	22.29	18.51	20.95
Question formulation	33.46	26.72	33.46	25.26	27.74	22.34	37.75	20.21	46.40	**23.61**	**36.32**	**39.86**	**22.90**	54.03	21.65
Preposition use	14.65	7.33	14.65	8.42	6.57	12.44	13.39	14.85	10.81	13.33	12.88	14.23	11.66	12.54	13.27
Finiteness marking	5.86	3.02	5.86	3.16	2.92	6.85	4.26	6.04	4.24	3.33	6.22	4.45	6.13	4.78	5.45
Other: grammar goal	9.40	7.33	9.40	6.32	8.03	7.61	9.74	6.22	12.29	5.83	8.94	10.32	7.36	14.03	6.56

(*table continues*)

Table 5. *(Continued).*

	Omnibus language (*df* = 1)		Vocabulary (*df* = 2)			NVIQ (*df* = 1)		Finiteness marking impairment (*df* = 1)		Decreased MLU (*df* = 1)		Speech (*df* = 1)		Pragmatic (*df* = 1)	
Clinical decisions	**Imp**	**BL**	**Imp**	**BL**	**NM**	**WNL**	**NM**	**Imp**	**NM**	**Imp**	**NM**	**WNL**	**NM**	**Imp**	**NM**
Specific pragmatic goals															
Eye contact	**14.58**	**43.24**	**14.58**	**45.45**	**25.00**	20.00	20.45	12.50	21.43	**33.65**	**15.12**	**14.69**	**42.11**	21.34	14.58
Avoidance of perseveration	15.97	10.81	15.97	12.12	0.00	10.00	15.06	5.00	16.15	8.65	17.44	15.73	11.84	16.56	4.17
Appropriate vocal volume	26.39	10.81	**26.39**	**12.12**	**0.00**	0.00	23.86	85.00	15.53	**40.38**	**16.28**	**26.57**	**10.53**	15.92	70.83
Initiating/maintaining conversation	84.46	87.84	86.46	86.36	100.00	90.00	86.65	50.00	91.30	**73.08**	**92.25**	86.71	86.84	91.08	58.33
Classroom functioning	38.89	43.24	38.89	42.42	50.00	60.00	39.20	25.00	41.61	**34.62**	**41.86**	38.46	44.74	41.40	29.17
Other: pragmatics	6.60	28.38	**6.60**	**31.82**	**0.00**	0.00	11.36	0.00	12.42	**20.19**	**7.36**	**6.64**	**27.63**	12.74	0.00
Monitoring selection															
Monitor	**4.47**	**43.85**	**4.74**	**51.97**	**27.33**	17.34	26.81	21.29	26.10	**36.12**	**11.40**	**3.09**	**34.47**	25.52	22.74
Follow-up	**3.20**	**18.24**	3.20	19.67	15.33	10.59	10.42	10.85	10.10	13.93	7.07	**1.70**	**15.09**	7.61	11.93
Other: monitoring approach	2.99	11.87	2.99	10.16	15.33	9.31	6.28	7.38	7.20	8.04	6.55	2.63	9.73	3.33	9.29

Note. Percent "yes" to each clinical decision by child characteristic and collapsed across vignettes. Bolded text represents the differences discussed in the Results section. Impaired, standard scores < 78; borderline, standard scores of 83–85; percentiles > 33rd for speech; standard scores > 100 for nonverbal intelligence quotient. NVIQ = nonverbal intelligence quotient; MLU = mean length of utterance; Imp = impaired standard score; BL = borderline standard score; NM = symptom not mentioned in the vignette; WNL = within normal limits.

Table 6. The influence of practitioner characteristics on clinical decisions.

	Cumulative years of experience (*df* = 3)				Finiteness marking knowledge (*df* = 1)		Verb tense knowledge (*df* = 1)		LI eligibility opinion (*df* = 1)		Grammar training (*df* = 4)				
Clinical decisions	**< 5**	**6–20**	**21–35**	**35+**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Not**	**Slight**	**Mod**	**Very**	**Extreme**
Recommendation for (continued) services	64.33	62.25	63.95	70.93	76.09	63.34	65.10	57.41	73.88	59.72	54.17	62.88	59.79	66.00	70.22
Type of service delivery															
Pull-out	43.86	47.22	49.46	50.19	52.17	47.30	48.47	41.20	55.93	43.66	33.33	46.21	44.26	50.00	51.37
Push-in	32.46	26.26	29.53	24.51	39.68	29.15	27.91	29.17	34.29	25.10	45.83	35.61	26.19	26.40	31.69
Teacher consultation	40.06	37.12	38.59	44.36	54.35	37.84	39.37	36.11	45.83	35.44	33.33	40.91	37.98	38.13	41.80
Parent consultation	26.02	25.76	21.92	35.02	39.13	24.93	26.11	24.54	31.25	23.17	33.33	22.73	24.50	25.87	29.23
Other: service delivery	2.34	3.91	1.81	3.89	7.97	2.66	3.18	1.85	3.37	2.78	4.17	0.00	2.91	2.93	4.10
Intervention content															
Speech	14.91	11.87	10.69	14.40	10.87	12.52	12.22	13.89	14.74	11.35	20.83	14.39	11.33	11.87	14.75
Language	57.60	57.58	60.87	63.81	70.29	58.50	59.99	54.17	67.63	55.37	54.17	56.82	55.74	61.20	63.39
Voice	0.58	0.51	0.72	1.17	1.45	0.61	0.64	0.93	0.96	0.46	4.17	0.00	0.46	0.67	1.09
Fluency	0.52	0.00	0.00	1.88	1.11	0.29	0.40	0.00	0.48	0.29	0.00	0.00	0.69	0.18	0.43
Pragmatics	36.46	32.81	29.75	33.13	34.44	32.43	32.70	31.58	30.22	34.10	44.44	38.46	32.41	31.16	34.76
Other: intervention content	0.52	2.26	2.15	3.75	2.22	2.14	1.89	4.39	2.64	1.59	0.00	3.85	1.03	1.99	3.00
Specific language goals															
Syntax development	55.68	49.76	59.35	43.92	60.98	52.07	55.08	32.08	54.96	51.39	38.46	44.29	45.54	57.42	52.83
Nonlinguistic cognition	11.93	6.01	5.48	8.78	6.10	7.33	6.78	11.32	9.92	5.57	7.69	11.43	4.92	6.81	10.53
Auditory processing	2.84	3.13	7.74	12.84	3.66	5.99	4.87	14.15	7.63	4.80	7.69	10.00	7.08	3.29	7.66
Sentence formulation	54.55	53.85	59.68	66.89	57.32	57.54	58.16	51.89	58.02	57.12	30.77	51.43	55.38	59.39	60.77
Vocabulary development	55.11	69.71	68.39	62.16	65.85	65.81	64.72	75.47	72.01	62.23	61.54	60.00	66.15	66.67	66.99
Listening comprehension	25.00	26.44	33.87	44.59	20.73	31.28	29.87	40.57	33.59	29.10	61.54	31.43	33.23	27.23	33.49
Narrative skills	37.50	39.90	35.48	47.30	45.12	38.74	38.56	45.28	41.48	38.24	30.77	34.29	40.92	38.73	40.67
Literacy	13.64	14.90	16.45	20.27	20.73	15.50	14.62	27.36	16.79	15.17	46.15	22.86	14.15	15.02	16.75
Morphology development	50.57	42.55	43.55	40.54	58.54	42.67	45.13	33.02	51.40	39.16	23.08	31.43	38.46	48.83	47.85
Other: language goal	13.07	11.30	11.29	13.51	15.85	11.57	12.39	7.55	10.69	12.23	7.69	12.86	12.31	11.27	11.48
Specific grammar goals															
Verb tense use	59.09	53.24	60.97	55.41	58.54	56.66	59.00	37.38	57.76	56.41	38.46	50.00	49.69	62.44	60.77
Verb vocabulary development	39.20	45.08	49.68	36.49	50.00	43.76	44.92	38.32	46.56	42.97	15.38	37.14	37.42	47.65	52.63
Complex sentence use	40.34	41.25	43.87	52.03	43.90	43.34	44.28	35.51	45.55	42.04	7.69	45.71	35.89	47.89	46.89
Pronoun use	19.32	19.66	23.55	15.54	15.85	20.54	21.29	10.28	25.70	16.85	7.69	14.29	17.79	20.19	26.32
Question formulation	29.55	29.02	34.52	37.84	32.93	31.89	30.30	46.73	32.32	31.99	15.38	28.57	31.60	27.23	44.98
Preposition use	17.05	12.71	15.16	4.73	10.98	13.21	12.82	14.95	16.28	11.13	7.69	7.14	13.80	13.38	13.88
Finiteness marking	6.82	6.47	3.23	4.05	28.05	3.30	5.30	4.67	6.62	4.48	0.00	4.29	6.13	5.40	4.31
Other: grammar goal	7.39	8.39	7.74	14.86	8.54	8.98	8.79	10.28	9.16	8.81	0.00	4.29	9.82	10.33	6.70

(*table continues*)

Table 6. *(Continued).*

Clinical decisions	Cumulative years of experience (*df* = 3)				Finiteness marking knowledge (*df* = 1)		Verb tense knowledge (*df* = 1)		LI eligibility opinion (*df* = 1)		Grammar training (*df* = 4)				
	< 5	6–20	21–35	35+	Yes	No	Yes	No	Yes	No	Not	Slight	Mod	Very	Extreme
Specific pragmatic goals															
Eye contact	20.00	20.14	22.11	18.87	6.67	21.69	21.17	13.89	23.02	18.88	50.00	32.26	14.91	21.05	22.50
Avoidance of perseveration	24.29	11.11	13.68	15.09	16.67	14.76	15.34	11.11	20.63	11.59	50.00	22.58	14.04	15.79	11.25
Appropriate vocal volume	22.86	20.14	25.26	28.30	23.33	23.19	23.93	16.67	25.40	21.89	0.00	19.35	17.54	27.07	26.25
Initiating/maintaining conversation	91.43	87.50	86.32	79.25	76.67	87.65	86.91	86.11	88.89	85.41	100.00	93.55	90.35	81.95	86.25
Classroom functioning	34.29	38.89	40.00	49.06	40.00	39.76	38.65	50.00	42.86	38.20	100.00	41.94	38.60	39.10	41.25
Other: pragmatics	7.14	11.11	11.58	15.09	23.33	9.94	11.66	5.56	7.94	12.88	0.00	16.13	7.89	12.78	11.25
Monitoring selection															
Monitor	29.17	22.57	23.25	20.55	13.14	24.50	23.58	24.41	19.02	25.99	34.78	24.39	26.94	23.87	16.76
Follow-up	10.71	10.63	10.59	9.49	5.11	10.90	9.48	18.31	8.94	11.18	21.74	13.01	11.41	10.01	8.38
Other: monitoring approach	5.36	7.74	8.70	5.53	11.68	6.94	7.26	7.51	4.88	8.37	0.00	3.25	7.77	7.13	8.10

Note. Percent "yes" to each clinical decision by practitioner characteristic and collapsed across vignettes. Bolded text represents differences discussed in the Results section. Impaired, standard scores < 78; borderline: standard scores of 83–85; percentiles > 33rd for speech; standard scores > 100 for nonverbal intelligence quotient. LI = language impairment.

recommended the following treatment goals less frequently: "listening comprehension," "narrative skills," "literacy," "question formulation," "initiating and maintaining conversation with peers," and "other: pragmatics." Respondents selected "monitoring" more frequently when decreased MLU was present.

Speech

As seen in Table 4, WNL speech sound information increased the likelihood of recommendation for (continued) SLP services, $\chi^2(1) = 381.90$, $p < .001$, $V = .443$. They selected "pull-out," "push-in," and "teacher consultation" service delivery model more frequently, while they recommended "parent consultation" less frequently (see Table 5). Respondents selected the intervention contents of "speech," "language," and "pragmatics" more frequently. Respondents selected the following treatment goals more frequently: "sentence formulation," "vocabulary development," "narrative skills," "listening comprehension," "question formulation," and "appropriate vocal volume." They selected the following treatment goals less frequently: "literacy," "morphology development," "eye contact," and "other: pragmatic goal." Finally, monitoring approaches were less likely to be selected when WNL speech sound information was present.

Pragmatic Impairment

As seen in Table 4, the child characteristic of pragmatic impairment had no influence on the recommendation for (continued) SLP services, $\chi^2(1) = 4.30$, $p = .038$, $V = .047$.

The Influence of Practitioner Characteristics

Refer to Tables 4 and 6 for significance testing and effect sizes for practitioner characteristics. A significant moderate correlation appeared between grammar and SLI training, $r_s(323) = .635$, $p < .001$. Therefore, we only reported on grammar training. No other associations appeared, including between knowledge of finiteness marking and verb tense. Overall, practitioner characteristics had few significant outcomes for influences on clinical decisions.

Cumulative Years of Experience

As seen in Table 4, cumulative years of experience did not influence the recommendation for (continued) SLP services, $\chi^2(3) = 6.42$, $p = .093$, $V = .057$.

Finiteness and Verb Tense Knowledge

As seen in Table 4, neither finiteness marking knowledge nor verb tense knowledge influenced the recommendation for (continued) SLP services, $\chi^2(1) = 9.06$, $p = .002$, $V = .068$, and $\chi^2(1) = 4.95$, $p = .029$, $V = .050$, respectively.

LI Eligibility Opinion

As seen in Table 4, respondents who reported the LI eligibility opinion were significantly more likely to recommend (continued) SLP services, $\chi^2(1) = 36.78$, $p < .001$, $V = .138$. They were also more likely to recommend "pull-out" services and the "language" intervention content (see Table 6). Only one treatment goal was influenced—those with the LI eligibility opinion were more likely to select "morphology development." No influence on monitoring approach emerged.

Grammar Training

As seen in Table 4, reported level of grammar training had no influence on the recommendation for (continued) SLP services, $\chi^2(4) = 13.53$, $p = .009$, $V = .084$.

Discussion

Of the evidence reported, three key implications of the results emerged. First, we demonstrated the utility of vignette methodology within the communication sciences and disorders discipline. Second, SLPs recommended services for individuals with SLI at higher rates than in actual practice, suggesting that influences external to the child–SLP diagnostic interaction are likely contributing to the underrepresentation of SLI. Third, clinical decisions varied across the profiles in the vignettes with increasing vulnerability for lack of or ineffective treatment services at each clinical decision point. Child characteristics influenced clinical decisions more often than practitioner characteristics.

The Utility of Vignette Methodology

Response patterns throughout the vignettes appeared in expected ways given the established literature on the SLI profile, rates of identification for services, and previously reported clinical practices of SLPs. Systematic construction of dimensions of affectedness allowed us to narrow in on the specific components of a diagnostic profile and the various characteristics of the SLPs that influence clinical practice. With the removal of confounding factors, the results aid in isolating what intervening steps are necessary to improve quality of care for the SLI population and monitor changes.

As compared to a Records and Tomblin's (1994) investigation of SLPs' diagnostic practices, the results presented here documented that the severity of standard scores continues to be a significant influence for rates of identification across varying dimensions of affectedness. However, while they identified a reliance on the discrepancy model between language and nonverbal standard score information, we did not. The presence or absence of WNL NVIQ information did not influence recommendation rates for services, which could be due to policy change initiatives in the time between their study and today.

Zhang and Tomblin (2000) documented that the saliency of symptoms impacted the rate of identification for SLP services. Students with speech impairment with or without an additional LI were significantly more likely to be receiving SLP services than those with LI alone; speech impairment was potentially more salient to those involved in the clinical decision-making process. In the vignettes, this previously documented association between rate of recommendation and saliency of symptoms held. Vignettes with speech or pragmatic information led to more frequent

recommendations for services, even when speech performance was WNL. That this pattern held even in the absence of workplace characteristics (e.g., policies, caseload size, time and resource constraints) was a unique and important contribution to the literature. Advocacy targeting workplace characteristics alone will not improve recommendation rates for all individuals with SLI. The profession needs to increase SLP competency regarding the varying clinical profiles of SLI and less salient symptoms (e.g., finiteness marking impairment, decreased MLU).

Higher Recommendation Rates for SLP Service Than in Actual Practice

Tomblin et al. (1997) documented an epidemiological base rate of approximately 7% of the general population for SLI, with only 29% identified for services by kindergarten. Stakeholders (e.g., SLPs, administrators, policy makers, parents) need to understand why the underidentification is occurring in order to intervene at the appropriate level. Under neutral workplace circumstances, SLPs recommended services for individuals with SLI at higher rates than in actual practice, with five of the six vignettes recommended at higher rates than previously documented by Tomblin et al. This discrepancy between the vignettes and actual practice suggests a noteworthy conclusion—SLPs have the competency to identify individuals with SLI at higher rates than are occurring in actual practice. The question becomes: What causes the breakdown in actual practice? One possibility is that workplace characteristics, which are external to the child–practitioner relationship, are impacting and constraining the choices available to the SLP.

In structured interviews with practicing SLPs, Fulcher-Rood et al. (2018) revealed that federal, state, and local policies influenced diagnostic decision making for LIs. They discussed a possibility that SLPs mistake workplace guidelines for mandatory policies, thus adhering to suggested recommendations deviating from best practice. In the vignettes, the responding SLPs could make decisions without the overlay of diagnostic models. Within the IDEA framework, autonomous clinical decision making has boundaries due to legal mandates such as the consideration of academic impact and SLPs functioning within the educational team where other professionals (e.g., school psychologist) may lead. School-based SLPs are not alone regarding the impact of workplace characteristics. Within the medical model, health insurance reimbursement plays a role in eligibility for services. Another possibility for a lower rate of identification in actual practice is that SLPs may not choose assessments well (Betz et al., 2013), leading to lower rates of identification. Within the vignettes, we removed these confounds of workplace policies and guidelines and diagnostic assessment selection, as well as referral sources' knowledge of SLP service provision. Therefore, one or a combination of these confounds may be implicated in the underrepresentation discrepancy in actual practice.

Advocacy for the removal and reduction of constraining workplace characteristics (e.g., policies, caseload and time management) and the improvement of competency for diagnostic practice will likely improve recommendation rates of individuals with SLI for SLP services. Previous reports of clinical practices have primarily focused on school-based SLPs. Future research should explore the knowledge and practice patterns of referral sources (e.g., teachers, physicians) and whether differences in competencies and practices occur across work settings.

Variation in Clinical Decision Making

The primary aim for this study was how SLPs use research outcomes to inform their clinical decision making. A noteworthy consideration is that children meeting the research-based criteria of SLI are the population documented to have significant long-term impacts, and those same individuals are unidentified and underserved. Although SLPs recommended the clinical profiles portrayed in the vignettes for SLP services at higher rates than in actual practice, rates did not reach 100% as expected if operating under ideal circumstances and relying on research information. Respondents identified some profiles of SLI over 90% of the time, while others ranged from 26% to 50%. Variation also occurred throughout the entire clinical decision-making process. Even with all workplace characteristics and diagnostic practices removed, not one of the six vignettes meeting the research-based criteria of SLI consistently overcame all the barriers, leading to identification for services and intervention targeting the underlying deficits of SLI (e.g., finiteness marking, complex sentences, verb tense use, morphology and syntax development). Vignette D perhaps came the closest.

A dwindling effect occurred as respondents encountered each clinical decision point, with fewer profiles ultimately receiving targeted intervention for the underlying deficits associated with the SLI diagnostic profile. Respondents recommended three of the vignettes consistently with high rates for SLP services—A, C, and D. This clinical decision point was crucial and left the remaining three vignettes notably at risk for lack of services. Of those rated highly for services, respondents consistently recognized the need for language intervention; however, for A and C, they also identified speech and pragmatics, which potentially would reduce the focus of intervention targeting the unique underlying deficits of SLI. At the end of the clinical decision-making process, the respondents selected the syntax and morphology development language goals around chance or lower for A, C, and D. They selected the verb tense use goal 67% of the time for A but only 26% of the time for C while rarely selecting finiteness marking.

The Influence of Child and Practitioner Characteristics

We investigated the influences of child and practitioner characteristics to see why variation across the vignettes occurred for clinical decision making. Practitioner characteristics influenced various response choices throughout the

clinical decision-making process but with a relatively small magnitude in difference, while some influences of child characteristics were quite large. A summary is that SLPs used the omnibus test results to determine the presence or absence of an LI. Students with borderline scores were vulnerable to be determined as less impacted than students with lower standard scores. As documented in previous literature (Betz et al., 2013; Fulcher-Rood et al., 2018), respondents heavily relied on standardized testing results despite profiles with borderline scores displaying inclusionary clinical symptoms associated with research-based SLI diagnostic criteria (i.e., finiteness marking, decreased MLU). This study contributes to the research evidence that respondents demonstrated this practice even within a context where workplace considerations were to be ignored. Therefore, workplace policies alone are not the cause of this practice.

Surprisingly, respondents recommended vignettes with the presence of WNL percentile scores for speech significantly more often than those without that information. When considering the manipulations of the vignettes outlined in Table 1, one may question whether this effect was spurious given that speech information appears only with language or vocabulary standard scores below 78. That is, perhaps, the severity of the LI was driving this finding. However, when analyzing selections of intervention targets by child characteristics, results revealed a higher selection of speech intervention content when speech percentiles were present. In fact, respondents determined speech as an intervention content for Vignette A 53.68% of the time, although performance on the standardized speech assessment was well WNL. This finding leads to the speculation of how SLPs are interpreting score information. Perhaps, respondents interpreted the description of performance at the 33rd percentile for speech as a standard score of 33. Alternatively, there may be a common, but erroneous, assumption that speech impairments and LIs are likely to co-occur, despite evidence to the contrary (Shriberg, Tomblin, & McSweeny, 1999).

No significant influence of presence or absence of finiteness marking, pragmatic impairment, or WNL NVIQ standard scores appeared for the identification. Decreased MLU, surprisingly, led to a decrease in recommendation rates for (continued) SLP services. All the child characteristics influenced service delivery, intervention domain, and treatment goal selection to some degree. The results are in concert with symptom-driven practice. For example, when SLPs identified speech or pragmatics as impaired, they selected those areas as intervention targets more often. Selection of specific treatment goals also paralleled the clinical symptoms present in the vignettes such that goals addressing underlying deficits associated with SLI were selected more frequently when finiteness marking impairment was present. A similar pattern emerged for pragmatic impairment symptoms and selection of pragmatic goals. However, these same language-based clinical symptoms did not influence identification rates for services. An important conclusion is that SLPs recognize the clinical symptom of finiteness marking and verb tense as an important treatment goal but, without this same symptom functioning as an inclusionary criterion for identification for services, the opportunity to address finiteness marking and verb tense therapeutically disappears. While finiteness marking impairment increased the likelihood of service recommendation and language intervention based on descriptives, decreased MLU did not seem to have the same protective factor. Whether SLPs recognized the decreased MLU clinical symptom as relevant to clinical decision making in the vignettes is unclear. The presence of this symptom decreased the likelihood of identification for services and the language intervention content, and it had limited influence on the selection of the underlying deficit goals. These findings support that SLPs overrely on standardized testing information, despite the presence of clinical symptoms and functional impact (Betz et al., 2013; Fulcher-Rood et al., 2018). However, the reverse appears for how the respondents made sense of the speech sound information. Recommendation rates increased for the clinical symptom of speech impairment, despite standardized score information reporting WNL abilities. Thus, how SLPs interpret assessment information for speech and language is divergent. Reliance on clinical symptoms for speech was sufficient, but not for language. Additionally, the limited influence of decreased MLU on clinical decisions supports previous findings documenting decreased clinical competency and deviations of practice patterns for language sample analysis (Pavelko et al., 2016).

These increased variations of service based on child characteristics in the absence of workplace characteristics are promising. However, the misinterpretation of the WNL speech sound percentiles and pragmatic impairment symptoms as nonlanguage targets for individuals with SLI is concerning. Misinterpretations of the clinical symptoms may have led to a missed diagnosis or misdiagnosis as well as the development of irrelevant (or at least less relevant) intervention targets. Vignettes B and E are examples of the consequences. These students met the research-based diagnostic criteria of SLI (i.e., 1 *SD* or more below average on an omnibus language assessment, finiteness marking impairment) but went unidentified for services for most respondents. Further, when identified for services, respondents selected pragmatic intervention more often than language for Vignette E. A continued possibility of a missed diagnosis or misdiagnosis means that, even when identified for speech-language pathology services, they may not be receiving appropriate intervention. These findings are in alignment with work from Schmitt, Justice, Logan, Schatschneider, and Bartlett (2014), who found that IEP goals rarely align with areas of need based on language testing. Specifically, IEP goals only aligned with documented areas of need in the domain of vocabulary and not for grammar.

Limitations

Given the novelty of vignette methodology in the speech-language pathology literature, this study was primarily exploratory to identify areas in need of further study

related to clinical decision making for the SLI population. A possible weakness was the lack of a control vignette that did not fit the SLI profile. However, the results of the study suggest there was not an overuse of selecting "yes" to services because Vignette B was identified only 26% of the time. The dimensions were not fully crossed in the vignette design as that would generate too large of an item pool for within-person analysis. For example, two of the vignettes portray children currently receiving SLP services, and these vignettes also had the lowest recommendation rates. While it is possible that respondents did not recommend continued services due to that provided information, it is more likely that the borderline nature of the assessment standard scores was consistent with the findings of Records and Tomblin (1994). An alternative interpretation is that current receipt of SLP services does not act as a protective factor for continued services. Another possible weakness is that the respondents had no opportunity to report what diagnosis they would provide for the vignettes. Therefore, it is possible that respondents identified a different diagnostic category (e.g., speech or pragmatic impairment only) rather than SLI; however, this study focused on identification rates, service delivery, and intervention framework rather than the diagnostic accuracy of the SLI label. Future studies could provide further clarification. As with any nonmandatory survey, self-selection bias and attrition are risks. The respondents reported here may differ from SLPs who belonged to the recruited groups and organizations but did not participate as well as those who participated but did not complete the survey. We took steps to avoid these nonrepresentative and volunteer effect biases (Burns et al., 2008; Eysenbach, 2004), including attempts to ensure a high response rate and post hoc comparisons of respondent demographics with those of the ASHA membership base.

Conclusion

Vignettes provide a useful method for investigating clinical decision making in the communication sciences and disorders discipline. They also allow for differentiating competency and practice patterns from confounding factors to inform organizational interventions aimed at improving care. The results from the study revealed that SLPs have the competency to recommend individuals with SLI for SLP services at higher rates than are occurring in actual practice. Interference of workplace characteristics or deviations from diagnostic best practice may impact recommendation rates. Child characteristics, specifically standard scores and percentiles, largely influenced clinical decision making across vignettes. The presumably more salient symptoms of speech and pragmatic impairment influenced clinical decision making as well, reflecting symptom-driven practice and perhaps assumptions about co-occurring symptoms. Even when individuals with SLI are recommended for services, intervention may not include a primary focus on language or target the underlying deficiencies associated with the clinical profile. Implications of the study are twofold. First, advocacy for the removal of constraining workplace characteristics is imperative. Second, SLPs would benefit from increased training relative to the clinical presentation of SLI, which will allow for higher sensitivity to inclusionary and exclusionary diagnostic criteria.

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Appendix (p. 1 of 5)

Survey Questions and Response Choices

1. Select the item that best describes you: Female Male

2. Please select one response to item (a) and one or more responses to item (b) that best describes you.

   a. Of Spanish-Hispanic origin: No Yes Do not know

   b. Select the item(s) that best describe you:

      American Indian, Eskimo, Aleut Asian or Pacific Islander

      Black or African American White Other Do not know

3. What is your current level of education: Bachelor's Master's PhD SLPD EdD

4. Do you currently have a professional certification in speech-language pathology? Yes No

5. What is your ***primary*** work setting as a speech-language pathologist?

      Medical Private practice School(s)

6. How many cumulative years have you worked as a speech-language pathologist?

      Less than 5 years 6–20 years 21–35 years 35+ years

7. Please indicate which of the following intervention targets you would address in grammar intervention regardless of whether it is listed as a goal. ***Select all that apply.***

   a. Pronoun use (e.g., she/he or him/her distinction)

   b. Verb tense use

   c. Verb vocabulary development

   d. Preposition use (e.g., in, on)

   e. Question formulation

   f. Complex sentences use (i.e., sentences containing 2+ verb phrases)

   g. Finiteness marking

   h. Other

Survey Questions and Response Choices

8. Should all students with a language impairment (i.e., 1 *SD* below average) be regarded as eligible for speech-language pathology services? Yes No

9. Please select how you feel regarding your previous training for the topics covered in this survey (i.e., pediatric language impairments).

a. Extremely well trained

b. Very well trained

c. Moderately well trained

d. Slightly well trained

e. Not well trained at all

10. Please select how you feel regarding your previous training for knowledge of grammar and identification of grammatical impairments in children

a. Extremely well trained

b. Very well trained

c. Moderately well trained

d. Slightly well trained

e. Not well trained at all

Vignette Instructions: The next section of the survey will present six case scenarios and ask you questions regarding recommendation of services and/or intervention. The number of questions presented per scenario is dependent on your responses.

Please assume that each student (a) is a monolingual speaker of standard American English, (b) has passed a hearing screening, (c) does not use AAC, (d) has no history of nonverbal cognitive impairments, (e) does not have a diagnosed syndrome, such as Down Syndrome, and (f) does not have autism.

Note. For this section, please use your professional judgment in order to identify whether the presented cases warrant services and/or intervention in an optimal and ideal setting. Disregard particular workplace protocols/policies for eligibility criteria and resource or time management constraints for the purposes of these questions.

Vignette Questions:

1. In your clinical opinion, would you recommend [child's initials] for speech-language pathology services?

a. Yes (i.e., direct intervention, teacher/caregiver consultation)

b. No

2. What type of services would you recommend? ***Select all that apply.***

a. Direct intervention outside the classroom/pull-out

b. Direct intervention inside the classroom/push-in

c. Consultation with teacher

d. Consultation with caregiver(s)

e. Other

*Only seen if "Yes" was selected in Question 1

Survey Questions and Response Choices

3. Would you recommend any of the following? ***Select all that apply.***

a. Monitor

b. Follow-up at another time

c. Other

*Only seen if "No" was selected in Question 1

4. What type of intervention would you recommend? ***Select all that apply.***

a. Speech/articulation

b. Language

c. Voice

d. Fluency

e. Pragmatics

f. Other

*Only seen if "Direct intervention outside/inside the classroom" was selected in Question 2

5. What intervention goals and objectives would you recommend for targeting [child's initials] language impairment? ***Select all that apply.***

a. Sentence formulation

b. Syntax development

c. Auditory processing

d. Morphology development

e. Literacy (e.g., reading comprehension, written composition)

f. Nonlinguistic cognition (e.g., working memory, attention, processing speed, RAN)

g. Listening comprehension

h. Narrative skills

i. Vocabulary development

j. Other

*Only seen if "Language" was selected in Question 4

Survey Questions and Response Choices

6. What intervention goals and objectives would you recommend for targeting difficulties with grammar? ***Select all that apply.***

a. Question formulation

b. Pronoun use (e.g., he/she, him/her)

c. Preposition use (e.g., in, on)

d. Verb vocabulary development

e. Complex sentence use (e.g., sentences containing 2+ verb phrases)

f. Verb tense use

g. Finiteness marking

h. Other

*Only seen if "Language" was selected in Question 4

7. What intervention goals and objectives would you recommend for targeting [child's initials] pragmatic impairment? ***Select all that apply.***

a. Eye contact

b. Avoidance of perseveration

c. Appropriate vocal volume

d. Initiating and maintaining conversations with peers

e. Functioning in the classroom (e.g., writing down assignments, asking for assistance)

*Only seen if "Pragmatics" was selected in Question 4

Vignette A: S. C. is a 7-year 5-month-old boy who was referred for speech-language pathology services by his teacher. His teacher stated that S. C. got along well with his classmates although he was somewhat shy. His teacher also stated that S.C. had a quiet voice and that he frequently mumbled when he answered questions. S. C. demonstrated some difficult with past tense (e.g., inconsistently producing "digged" for *dug* or "ride" for *rode*). When assessed, S. C. scored a standard score of 78 on the Peabody Picture Vocabulary Test–Fourth Edition (PPVT-4), a language quotient with 5 standard scores of 75 on the Test of Language Development–Primary: Fourth Edition (TOLD-P:4), and a score at the 33rd percentile on the Goldman-Fristoe Test of Articulation–Second Edition (GFTA-2). Assume that a nonverbal intelligence quotient is unavailable at this time. Additionally, a 200-utterance language sample was elicited and S. C.'s MLU was calculated to be 4.29.

Vignette B: C. C. is an 8-year 10-month-old girl who has received speech-language services for the past three years. Currently, C. C. sees the school speech-language pathologist two times per week for 30 minutes per session. During the sessions, C. C. works on pronoun use (e.g., she/her, she/he), present progressive –ing, and regular and irregular past tense verb forms. C. C.'s classroom teacher reports that she is very outgoing and has little difficulty making friends. C. C. is a hard worker and performs at or above grade level. C. C. does, however, demonstrate some difficulty with verb use, substituting a regular past tense form for an irregular past tense form on occasion (e.g., swimmed/swam). C. C.'s latest assessment indicates a Peabody Picture Vocabulary Test–Fourth Edition (PPVT-4) standard score of 85, a Test of Language Development–Primary: Fourth Edition (TOLD-P:4) standard score of 85, and a 200-utterance MLU of 5.52.

Vignette C: E. C.'s teacher is concerned about his communication skills. He reports that E. C. avoids communicating with his classmates. When he does communicate, he "rambles" and has little sense of "getting to the point." In addition, he lacks the skills for requesting, disagreeing, and role-playing that other second graders normally demonstrate. When E. C. is assessed by the speech-language pathologist, he receives a total language score of 69 on the Clinical Evaluation of Language Fundamentals–Fourth Edition (CELF-4) and a standard score of 71 on the Peabody Picture Vocabulary Test–Fourth Edition (PPVT-4). His score on the Goldman-Fristoe Test of Articulation–Second Edition (GFTA-2) is in the 62nd percentile.

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Survey Questions and Response Choices

Vignette D: The parents of B. D., a girl in first grade, have requested that she receive a speech and language evaluation. They report that B. D. occasionally omits the –s in plural constructions, –s in third-person singular verb constructions, *–ed* in past tense verb constructions, and forms of auxiliary verb BE. On the language assessment, B. D. scores a Peabody Picture Vocabulary Test–Fourth Edition (PPVT-4) standard score of 73 and a Clinical Evaluation of Language Fundamentals–Fourth Edition (CELF-4) total language standard score of 72. In addition, B. D.'s school records indicate that she received a standard score of 104 on the Columbia Mental Maturity Scales (nonverbal intelligence assessment), which revealed normal kindergarten readiness abilities, and normal physical development and gross/fine motor development.

Vignette E: A. P. is a 7-year 4-month-old boy who has received speech-language services for the past two years. Currently, A. P. sees the school speech-language pathologist once a week for 30 minutes per session. During the sessions, A. P. works on maintaining conversation with peers, using appropriate eye contact and body orientation, and improving awareness of his communication partner's needs (e.g., awareness of nonverbal gestures). During his IEP meeting this year, the speech-language pathologist reported that A. P. has made progress in his conversational exchanges with classmates as well as teachers. Additionally, he demonstrates a standard score of 85 on the Peabody Picture Vocabulary Test–Fourth Edition (PPVT-4), a total language score of 84 on theTest of Language Development–Primary: Fourth Edition (TOLD-P:4), and an MLU of 5.67 (based on a 100-utterance sample).

Vignette F: P. L. is an 11-year 7-month-old girl (fifth grade) who is receiving special education services through an IEP in math, language arts, physical/life sciences, and social sciences. In the classroom, her teachers report that she is quiet and works hard on her schoolwork. Her abilities to recognize and decode words are within normal limits. However, she exhibits difficulties with learning new material from texts. Teachers report that her responses on exams, conversational language, and written composition tend to be short, simple, and vague with missing curricular vocabulary. She demonstrates a standard score of 83 on the Clinical Evaluation Language Fundamentals–Fifth Edition (CELF-5) and a standard score of 102 on the Wechsler Intelligence Scales for Children–Fifth Edition (WISC-5).