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A step towards differentiating language difference from disorder

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Abstract

English learners (ELs) composed 10% of the American school-age population in the 2014 – 2015 school year. However, only a small percentage of speech language pathologists (SLPs) report feeling well qualified to address the cultural and linguistic needs of ELs. This can be attributed to a number of factors, including inadequate clinical markers, a shortage of developmental data for ELs, and a lack of cultural consideration in standardized assessments. Due to these barriers, SLPs struggle to differentiate between language differences and language disorders and are at risk for over-identifying or under-identifying language impairment (LI) in ELs. Research suggests that a hallmark of LI is particular difficulty with verb usage in English. This study examined whether children who demonstrated difficulty on a standardized test of morphology also demonstrated less proficient use of grammatical morphemes in conversation. The results were then compared to their peers who did not demonstrate difficulty on a standardized test of morphology.

Examining Verb Usage in English Learners

English learners (ELs) composed 10% of the American school-age population in the 2014 – 2015 school year. The U.S. Department of Education estimates that the percentage of ELs is even higher for children under the age of 6 (U.S. Department of Education, 2016). Scores on the National Assessment of Educational Progress (NAEP) indicate that many of these children will need support in acquiring English language skills. For example, on the 2015 NAEP reading assessment, 68% of the EL fourth graders scored below the basic reading level, while only 27% of the monolingual fourth graders scored below that same level (The Nation's Report Card, 2015). Although many ELs struggle to acquire English language skills, there are different causes for this difficulty including language difference and language disorder.

Some children simply have a language difference; "a rule-governed language style that deviates in some way from the standard usage of the mainstream culture" (Paul & Norbury, 2012, pp. 138). A language difference is caused by the cultural and linguistic variables from another language influencing the way children use English, including the sounds they produce and the grammatical structures they utilize. In contrast, other children have a language disorder; "a significant discrepancy in language skills relative to what would be expected…for a clients' age or developmental level" (Paul & Norbury, 2012, pp. 138). ELs with a language disorder will have consistent errors throughout all the languages they use, which may negatively impact their reading and writing skills (American Speech-Language-Hearing Association (ASHA), 2017a).

Speech language pathologists (SLPs) help support ELs' various language needs. SLPs assess children's language skills to determine whether their difficulty learning language is related to a language difference or disorder. According to ASHA's scope of practice (2017b), clinically competent SLPs are required to have the skills and knowledge to differentiate a language difference from a language disorder. The ASHA 2016 School Surveys, however, showed that only 8% of SLPs felt very qualified to address the cultural and linguistic needs that arise when working with ELs (ASHA, 2016).

There are many challenges to accurately assessing the language skills of ELs, including inadequate clinical markers, a shortage of developmental data for ELs, and a lack of cultural consideration in standardized assessment (Bedore & Peña, 2010; Paradis, Schneider, & Duncan, 2013; De Lamo, White, & Jin, 2011). When compared to their monolingual peers, typically developing (TD) ELs can show similar expressive and receptive delays as children with language impairment (LI). Because ELs' vocabulary, morphology, and syntax are still developing, their language abilities may be dispersed between the different languages. Thus, their language abilities in English may appear delayed or impaired, and testing with clinical markers in only English will not accurately capture their language skills (Bedore & Peña, 2010). Therefore, several challenges arise when assessing ELs because there are very few bilingual SLPs and little data on typical and atypical development in languages other than English (Paradis, Schneider, & Duncan, 2013). Many SLPs rely on standardized tests to assess ELs (Caesar & Kohler, 2007). These tests, however, often do not include ELs in the normative sample, nor do they take cultural factors into account (De Lamo, White, & Jin, 2011). For example, children from culturally diverse backgrounds may not have experience completing standardized tests.

Due to the lack of appropriate standardized assessments available for ELs, SLPs risk both under-identifying and over-identifying these students as having LI (Muñoz, White, & Horton-Ikard, 2014). Under-identification of ELs can occur when SLPs either delay or choose not to assess a disorder because they do not feel confident in the assessments available (Muñoz et al., 2014). When SLPs under-identify ELs with LI (EL-LI), students may not receive the appropriate services they need. These services may include therapy focused on reading, writing, and the development of language skills to better equip the child to succeed in academics and communication (ASHA, 2017c).

In contrast, over-identification occurs when SLPs label ELs as impaired when they are typically developing (EL-TD). Over-identifying ELs violates the Individuals with Disabilities Education Act, which states that a child cannot be identified as having a disability based on a lack of English proficiency (The Individuals with Disabilities Education Act of 2004, 2006). Both under- and over-identification violate ASHA's Code of Ethics, which requires SLPs to competently provide their services and to not discriminate based on culture, ethnicity, or dialect (ASHA, 2017d, para. 30 & 32).

In response to these issues, recent research has examined new ways to accurately differentiate EL-TD from EL-LI. These methods include using a combination of dynamic assessments (DAs), language sampling, and other observations. DAs allow a professional to consider the child's environment, home, and culture (Paradis et al., 2013; Pieretti & Roseberry-McKibbin, 2016; Rosa-Lugo, Rivera, & Rierson, 2010). While standardized assessments compare ELs' knowledge to norms that are culturally and linguistically biased, DAs allow SLPs to analyze ELs' learning processes. Because difficulty learning new information is an indicator of LI, this feature of DA allows an SLP to identify EL-LI without being proficient in their native languages (Peña, Gillam, & Bedore, 2014). The importance of this type of assessment can be seen in one study that found DA identified EL-LI with 80.6% to 97.2% accuracy (Peña et al., 2014).

Spontaneous language sampling analysis (LSA) allows clinicians to examine how a client's speech and language skills are used functionally (ASHA, 2017a). LSA has proven to be an important measure for diagnosing ELs, as the accuracy of distinguishing between EL-LI and EL-TD is greatly improved when LSA is combined with standardized tests in a diagnostic session (Horton-Ikard, 2010). For example, Jacobson and Walden (2013) found that calculating the number of word and morpheme omission errors from LSA proved to be an accurate predictor of language impairment across languages.

Research suggests morphemes that mark tense and agreement (e.g., third person singular –s, past tense –ed) pose a particular challenge for monolinguals with LI (Leonard, 2014). Individuals with LI show a significant difference in their acquisition of grammatical knowledge and do not appear to understand that tense marking in main verbs is a requirement of the language (Rice, Wexler, & Cleave, 1995). Therefore, experts in the field suggest that limited use of verb tenses is a clinical marker for LI in monolinguals (Rice & Wexler, 1996; Leonard, 2014).

Researchers have demonstrated that EL-LI also have particular trouble with verbs (Blom & Paradis, 2013; Gutierrez-Clellen, Simon-Cereijido, & Wagner, 2008). Blom and Paradis (2013) found that EL-LI demonstrated particular trouble with regular past tense markings on verbs in English, whereas EL-TD achieved significantly higher accuracy in this area. Taken together with research showing verbs are also more difficult for monolingual speakers with LI, these results suggest that difficultly with using correct verb morphology is a hallmark of LI, regardless of the child's first language.

The main goal of this project is to examine if ELs who demonstrate difficulty with a standardized test of morphology also demonstrate difficulty using grammatical markers in lessstructured language tasks, such as a conversational language sample. The specific research question included:

> Do children who demonstrate difficulty on a standardized assessment of morphology also demonstrate difficulty on measures obtained from a conversational language sample?

Design and Methods

This project compared the results of a standardized language assessment to conversational language samples collected in two of groups of ELs: one group who passed a standardized assessment of morphology (*n* = 10) and one group who failed the standardized assessment of morphology (*n* = 11). Data from this project was originally collected as part of a larger study examining spontaneous language sampling (Pavelko & Owens, 2017).

Participants

Children in the current study (14 males and 7 females) ranged in age from 3;1 to 7;7 with a mean age of 4;6 (SD = 14.8 months). The average age for ELs who passed the standardized test of morphology (TEEM-P) was 49.7 months (SD = 11.6 months) and was 61.3 months (SD = 15.1 months) for those who did not pass the standardized test of morphology (TEEM-F). As reported by the caregiver on a questionnaire, 11 (52%) of the participants were white, two (10%) were black/African American, and eight (38%) did not respond. When indicating ethnicity, 20 (95%) caregivers indicated their child was Hispanic/Latino and one (5%) did not respond.

Inclusion Criteria

Children meeting the following criteria were included in the present study:

- Passed a bilateral hearing screening at 25 dB;
- Passed the Primary Test of Nonverbal Intelligence (PTONI; Ehrler & McGhee, 2008), a screener for nonverbal intelligence. A passing score was defined as a standard score of 70 or higher;
- Completed the Test for Examining Expressive Morphology (TEEM; Shipley, Stone, & Sue, 1983), a standardized test of grammatical morphology;
- Completed a 10-minute conversational language sample with a trained examiner;
- Spoke Spanish in addition to English.

Procedures

The TEEM is a norm-referenced, standardized test used to examine expressive morphology and syntax. The test has 54 items in which children complete sentences (Shipley et al., 1983). For example, a child may be asked "This is a rabbit. Here are two ______", and the child has to complete the sentence. A failing score was defined as a raw score $\geq$ 2 SD below the mean. At this cut score, the TEEM demonstrates a sensitivity of .90 and a specificity of .95 (Merrell & Plante, 1997).

The Sampling Utterances Grammatical Analysis Revisited (SUGAR) protocol is a method to conduct language sample analysis (Pavelko & Owens, 2017). SUGAR includes a conversational protocol, which is designed to offer children opportunities to produce complex language, as well as specific guidelines for transcribing and analyzing language samples.

Data Scoring

TEEM. The TEEM protocol was scored according to the instructions in the examiner's manual.

SUGAR. The language samples were transcribed and analyzed using the SUGAR protocol (Pavelko & Owens, 2017). Using a modified consensus format (adapted from Shriberg, Kwaitkowski, & Hoffman, 1984), the first 50 child utterances of all samples were transcribed by an independent coder. A second independent coder listened to the sample while reading the transcript. Any discrepancies were discussed and consensus was reached. The agreed-upon transcript was used for all analyses.

Each transcript was independently analyzed by each coder for the four SUGAR metrics, using the procedures outlined in Pavelko and Owens (2017). Briefly, these were calculated as follows:

- Total Number of Words (TNW): all words, including up to two unintelligible words per utterance
- Mean Length of Utterance$_{SUGAR}$ (MLU$_S$): bound morphemes were separated by a space. The total number of morphemes was divided by 50.
- Words per Sentence (WPS): the number of sentences was divided by the number of words in those sentences
- Clauses per Sentence (CPS). Sentences were separated into clauses. The number of clauses was divided by the number of sentences. .

Inter-rater reliability was assessed using a two-way, random, average-measures intraclass correlation (ICC) to assess the degree that transcribers provided consistency in their analysis of the language samples for each of the LSA metrics. The resulting ICCs were: TNW, .997 (p = 0.000); MLU$_S$, .997 (p = 0.000); WPS, .995 (p= 0.000); CPS, .94 (p = 0.000). ICCs between 0.75 and 1.00 are considered excellent (Cicchetti, 1994).

FVMC. Each transcript was independently analyzed by the first author to identify correct use of copula BE, auxiliary BE, third person singular verbs, and past tense verbs, in obligatory contexts, and to calculate the Finite Verb Morphology Composite (FVMC). Results were jointly reviewed by the first author and faculty advisor. Consensus was reached on any disagreements and the agreed-upon result was used in all analyses.

Results

The research question examined whether children who demonstrated difficulty on the TEEM also demonstrated difficulty on measures obtained from a spontaneous language sample (i.e., MLU_S, TNW, CPS, WPS, and FVMC). Participants were divided into two groups: the TEEM-P group included all participants who received a passing score the TEEM (mean = 20.3; SD = 9.7), and the TEEM-F group included all participants who did not pass the TEEM (mean = 14.6; SD = 6.3). Table 1 presents each of the participant's scores for each language sample metric, disaggregated by each group. Across all metrics, mean values were higher for children in the TEEM-P group.

Table 1.

Language metrics, disaggregated by group.

TEEM-P							
Participant	TNW	MLU_S	WPS	CPS	FVMC	Obligatory Contexts	Overgeneralizations
35	310	6.92	8.16	1.16	93%	28	0
64	202	4.36	5.34	1.11	40%	20	0

86	180	4.06	4.63	1.03	76%	17	0
89	232	5.06	7.07	1.1	89%	19	2
113	174	3.86	4.4	1	89%	19	0
230	288	6.5	6.91	1.06	100%	18	0
338	318	7	7.3	1.22	100%	22	0
371	316	6.74	7.33	1.17	73%	15	1
375	187	4.16	5.56	1.04	71%	7	0
376	167	3.74	4.75	1.03	90%	10	0
378	283	6.32	6.16	1.14	88%	25	0
M (SD)	241.55	5.34	6.15	1.10	82.64	18.18	.27
	(62.04)	(1.35)	(1.29)	(.07)	(17.22)	(6.05)	(.65)
TEEM-F							
Participant	TNW	MLU$_S$	WPS	CPS	FVMC	Obligatory Contexts	Overgeneralizations
8	160	3.56	4.25	1.03	93%	15	1
22	248	5.22	5.94	1.16	67%	24	7
67	230	5.22	5	1.04	92%	13	0
106	195	4.3	5.16	1.03	91%	11	0
107	210	4.5	5.55	1.1	62%	13	1
110	236	5.42	6.25	1.19	94%	17	0
243	279	6.1	6.39	1.07	67%	6	0
246	206	4.78	4.48	1.1	50%	24	0

352	241	5.04	6.25	1.16	25%	8	0
374	130	2.9	3.85	1.04	75%	8	1
M (SD)	213.5	4.70	5.31	1.09	71.60	13.90	1.00
	(43.79)	(0.94)	(0.91)	(.06)	(22.45)	(6.30)	(2.16)

Data were analyzed using an overall multivariate analysis of co-variance (MANCOVA) examining the main effects of TEEM status for the dependent variables: (a) TNW, (b) MLU_S, (c) WPS, (d) CPS, and (e) FVMC, while controlling for age (covariate). Results indicated a statistically significant difference, F (5, 14) = 8.252, p = .001, η_p^2 = .747. Given the significance of the overall test, the univariate main effects were examined. Significant univariate main effects were obtained for three of the five LSA metrics: TNW, F (1, 18) = 9.752, p = .006, η_p^2 = .351; MLU_S, F (1, 18) = 9.483, p = .006, η_p^2 = .345; CPS, F (1, 18) = 18.91, p = .000, η_p^2 = .512. The main effects for WPS and FVMC were not statistically significant (F (1, 18) = 0.50, p = .489, η_p^2 = .027; F (1, 18) = 2.437, p = .136, η_p^2 = .119, respectively).

To further explore these findings, each participant's score was compared to the means and standard deviations reported by Pavelko & Owens (2017). Each child was matched to the age-appropriate group, and their four SUGAR metrics were recorded for either being within and above one standard deviation of the normal range or below (see Table 2). A total of 91% (n = 10) of the TEEM-P group also scored within one standard deviation of the mean on all four SUGAR metrics, compared to only 10% (n = 1) of the TEEM-F group. Additionally, we examined the use of each of the four morphemes included in the FVMC analysis. Children in the TEEM-P group were most accurate at producing the auxiliary BE (97% in obligatory contexts), followed by the copula BE (92% in obligatory contexts), third person singular *–s* (77% in obligatory contexts) and the past tense *–ed* (75% in obligatory contexts). Contrastively, children in the TEEM-F group were most accurate at producing the copula BE (94% in obligatory contexts), followed by auxiliary BE (67% in obligatory contexts), past tense *–ed* (55% in obligatory contexts), and third person singular *–s* (32% in obligatory contexts). Table 3 shows how many of each verb form was correctly produced, disaggregated by group status (i.e., TEEM-P or TEEM-F)

Table 2.

Language metrics within and above or below normal range, disaggregated by group.

TEEM-P

Participant	TNW	MLU_S	WPS	CPS
35	+	+	+	+
64	+	+	+	+
86	+	+	+	+
89	-	-	+	-
113	+	+	+	+
230	+	+	+	+
338	+	+	+	+
371	+	+	+	+
375	+	+	+	+
376	+	+	+	+
378	+	+	+	+

Totals (*n*=11)	10/11 (91%)	10/11 (91%)	11/11 (100%)	10/11 (91%)
TEEM-F				
Participant	TNW	MLU_S	WPS	CPS
8	-	-	-	-
22	+	-	-	+
67	+	+	-	-
106	-	-	-	-
107	-	-	-	-
110	+	+	+	+
243	-	-	-	-
246	+	+	-	+
352	+	-	+	+
374	-	-	-	+
Totals (*n*=10)	5/10 (50%)	3/10 (30%)	2/10 (20%)	5/10 (50%)

Table 3.

FVMC results: TEEM-P group.

TEEM-P					
FVMC Metric	# Correct in obligatory contexts	# Incorrect in obligatory contexts	Overgeneralizations	Total	% Correct
Auxiliary BE	30	1	0	31	97%

Copula BE	79	7	0	86	92%
Third Person Singular *–s*	50	15	0	65	77%
Past Tense *–ed*	18	3	3	24	75%

TEEM-F

FVMC Metric	# Correct in obligatory contexts	# Incorrect in obligatory contexts	Overgeneralizations	Total	% Correct
Copula BE	60	4	0	64	94%
Auxiliary BE	18	9	0	27	67%
Past Tense *–ed*	11	0	9	20	55%
Third Person Singular *–s*	7	15	0	22	32%

Discussion

This study examined whether children who are English learners (ELs) and demonstrated difficulty on a standardized test of morphology (TEEM-F) also demonstrated difficulty with measures obtained from a spontaneous language sample (i.e., MLU_S, TNW, CPS, WPS, and FVMC), when compared to their peers who did not demonstrate difficulty on a standardized test of morphology (TEEM-P). Results indicated that participants in the TEEM-F group demonstrated significantly lower scores on TNW, MLU_S, and CPS when compared to participants in the TEEM-P group. There were no significant group differences on two of the measures – FVMC and WPS.

To further explore group differences in the spontaneous language samples, we examined use of four grammatical morphemes (i.e. copula BE, auxiliary BE, past-tense –*ed*, and the third person singular –*s*) and compared the results to those reported for monolingual speakers. Results indicated that the participants in the TEEM-P group appeared to follow the same order of acquisition as monolingual speakers. Children in this group had the highest level of accuracy when producing copula BE and auxiliary BE and had an average age of 49 months. Data from monolingual speakers developing language typically indicate that children this age also produce copula BE and auxiliary BE with high levels of accuracy (Owens, Pavelko, & Bambinelli, 2018). Therefore, although children in the TEEM-P group were ELs, they demonstrated similar grammatical abilities as their monolingual peers.

Contrastively, the children in the TEEM-F group demonstrated a different pattern of acquisition. Children in this group were an average age of 69 months and were most accurate at producing copula BE, auxiliary BE, and past tense –*ed*. Data from TD monolingual speakers indicate that children this age use copula BE, auxiliary BE, and the third person singular –*s* with high levels of accuracy and have more difficulty producing past tense –*ed* (Owens et al., 2018). Thus, children in the TEEM-F group did not follow the same order of acquisition as their monolingual peers. This different pattern of acquisition could be due to a language disorder. Because the children in the TEEM-P group demonstrated the same order of acquisition as their monolingual peers, the different pattern evidenced in the TEEM-F group may indicate underlying language impairment.

Limitations

There are at least two limitations to this study. First, children in the TEEM-F group did not have a diagnosis of language impairment. Although children in the group demonstrated difficulty on both a standardized test of morphology and measures obtained from a spontaneous language sample, these children did not complete a comprehensive language assessment. Therefore, it is possible that these participants, while demonstrating difficulty in English, only had a language difference not a language disorder.

Second, there were no significant group differences on the FVMC or WPS, which could have been due to the small sample sizes. For example, a post hoc power analysis for the FVMC revealed a power of .315; therefore, the lack of statistical significance may be a function of a small sample size. Similar to the findings of Blom and Paradis (2013), however, these results also indicated that children in the TEEM-F group demonstrated particular trouble with regular past tense markings on verbs in English (55% correct), when compared to those in the TEEM-P group (75% correct).

Future Directions

This study has found several differences when comparing two groups of EL children. The TEEM-P group passed a standardized test, demonstrated significantly higher scores in the language sample metrics, and showed a language acquisition pattern similar to that of their monolingual peers. The TEEM-F group, however, failed the standardized test, demonstrated significantly lower language sample metric scores, and showed an atypical pattern of language acquisition. These culminating results indicate that children in the TEEM-F group may have a language impairment.

These results warrant a further investigation into the significance of qualitatively examining an EL's language abilities. This study found that ELs who failed the TEEM and showed significantly lower scores on the language sample metrics also had a deviant language acquisition pattern. If a child who is an EL is demonstrating an atypical pattern of language acquisition, an underlying language impairment may be present.

A future study would need a large sample size and a comprehensive language assessment to determine the significance of using a qualitative analysis to supplement the identification of EL-LI. First, EL-LI would need to be identified from a group of age-matched EL participants. This can be accomplished through dynamic assessment and a comprehensive language assessment. Once EL-LI have been identified, a language sample should be taken from both EL-LI and EL-TD. The language samples would then be analyzed to examine the language acquisition patterns demonstrated by EL-LI and EL-TD. If significant differences in language acquisition arise between the two groups, then a deviant pattern of development could accurately diagnose LI in EL. SLPs would then be able to use this qualitative approach as a way to supplement their identification of EL-LI.

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