

Research Note

Polish Vocabulary Development in 2-Year-Olds: Comparisons With English Using the Language Development Survey

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Purpose: The objective of this study was to compare vocabulary size and composition in 2-year-olds learning Polish or English as measured by the Language Development Survey (LDS; Rescorla, 1989).

Method: Participants were 199 Polish toddlers ($M = 24.14$ months, $SD = 0.35$) and 422 U.S. toddlers ($M = 24.69$ months, $SD = 0.78$).

Results: Test–retest reliability was .92, internal consistency was .99, and concurrent validity was .55. Girls had higher vocabulary scores than boys. Mean LDS score was significantly lower in Polish than in English, and fewer Polish children had LDS scores >200 words. Also, more words were reported for

<25% of the children, and fewer words were reported for $\geq 75\%$ of the children, in Polish than in English. The cross-linguistic correlation for word frequencies was .44. Noun dominance was comparable in the two languages, and 55 cross-linguistic word matches were found among the top 100 words. Although more Polish than U.S. children had <50 words (18.1% vs. 8.3%), children with <50 words and those with ≥ 50 words were generally acquiring the same words. **Conclusions:** Vocabulary acquisition appeared to be slower in Polish than in English, probably because of the complexity of the language. However, the languages were very similar with respect to vocabulary composition findings.

Previous studies have reported cross-linguistic vocabulary size and composition findings for Greek (Papaïliou & Rescorla, 2011), Korean (Rescorla, Lee, Kim, & Oh, 2013), Italian (Rescorla, Frigerio, Sali, Spataro, & Longobardi, 2014), and Portuguese (Rescorla, Nyame, & Dias, 2016) on the basis of the Language Development Survey (LDS; Rescorla, 1989), after adaptations had been made to reflect cultural/linguistic characteristics of each comparison language. Given recent focus on the importance of replication (Open Science Collaboration, 2015), the present study examined whether vocabulary development in Polish as measured by the LDS would show some of the same patterns found in these four other languages.

Vocabulary Checklists

The 310-word LDS (Achenbach & Rescorla, 2000; Rescorla, 1989) was developed as a screening tool for early

language delay for children from 18 to 35 months of age. Although the LDS is much shorter than the 680-word MacArthur Communicative Development Inventory: Words and Sentences (CDI; Fenson et al., 1993, 1994), the correlation between total vocabulary score on the two measures was .95 for 239 U.S. toddlers (Rescorla, Ratner, Jusczyk, & Jusczyk, 2005). Both the CDI and the LDS have demonstrated large age-related increases in vocabulary size, large individual differences in vocabulary size, and a consistent gender difference favoring girls in English-speaking samples (Fenson et al., 1994; Rescorla, 1989; Rescorla & Achenbach, 2002; Rescorla & Alley, 2001).

Adaptations of both the CDI and the LDS have been used to test the degree to which children acquiring different languages manifest universal versus language-specific patterns of development. To compare languages with respect to vocabulary size and composition, the instruments must be comparable across languages in length (number of words), structure (words per semantic category), and content (words included). However, words judged less appropriate for the culture should be replaced with more appropriate words in the same category (e.g., replace “church” with “mosque” for Arabic). Furthermore, as noted by Dale (2015), Slavic languages do not have articles, Mandarin does not use many function words, and the

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English copula “is” may be represented by multiple verbs in some languages. Despite necessary modifications to address such issues, cross-linguistic studies using adaptations of vocabulary checklists are essentially *etic* in approach (Pike, 1967) because they compare languages using basically the same instrument, whereas speech samples or parental language diaries are *emic* in approach because they place no constraints on the words recorded.

Cross-Linguistic Research on Vocabulary Size

Cross-linguistic vocabulary checklist studies have yielded vocabulary size findings that are more similar than different (Dale & Goodman, 2005), including large individual differences in rate of lexical development as well as a significant gender difference (girls > boys). However, some variations in vocabulary size across languages have been found. For example, Bleses et al. (2008) reported that children learning Danish had lower CDI vocabulary scores than children acquiring 14 other languages, including Norwegian and Swedish, which they explained by the complex phonetic structure of Danish.

Other studies suggest that vocabulary size differences may be due to parental response styles. For example, mean LDS scores have tended to be higher for U.S. children in the 18- to 23-month age range acquiring English than for children in the same age range acquiring Greek (Papaeliou & Rescorla, 2011), Korean (Rescorla et al., 2013), Italian (Rescorla et al., 2014), and European Portuguese (Rescorla et al., 2016). In addition, Hamilton, Plunkett, and Schafer (2000), who used a British version of the CDI, reported that American children had larger reported vocabularies than British children at each age. Taken together, these findings suggest a “Lake Wobegon effect,” whereby American parents may be more lenient than parents in other countries regarding what they credit as words, especially when the children are just beginning to talk and words may not be articulated clearly.

Cross-Linguistic Research on Vocabulary Composition

Noun Bias

Much cross-linguistic research on vocabulary composition has focused on *noun bias*, on the basis of Gentner’s (1982) argument that nouns are generally learned before verbs because nouns typically refer to readily perceived objects, whereas verbs express relationships among things. On the basis of the CDI, noun bias has been reported in languages such as Spanish (Jackson-Maldonado, Thal, Marchman, Bates, & Gutierrez-Clellen, 1993), Japanese (Ogura, Dale, Yamashita, Murase, & Mahieu, 2006), and Turkish (Gentner, 1982) but not in Mandarin (Tardif, Shatz, & Naigles, 1997). Bornstein et al. (2004) reported more nouns than verbs in Spanish, Dutch, French, Hebrew, Italian, Korean, and English CDI data. Noun predominance has also been found in several languages on the basis of LDS data, including English (Rescorla, Alley, & Christine, 2001), Greek (Papaeliou & Rescorla, 2011), Korean (Rescorla et al., 2013), Italian (Rescorla et al., 2014), and European Portuguese (Rescorla et al., 2016). Thus, both CDI and

LDS studies show noun preponderance in many languages, consistent with Gentner’s theory.

Vocabulary Concordance

Rescorla et al. (2001) used *Q* correlations (Stephenson, 1935) to test concordance for LDS words in four U.S. samples. The *Q*s between *percentage use scores* (i.e., the percentage of children in each sample reported to use each word) were $\geq .90$. Within-language *Q* correlations of .95 were found in Korean (Rescorla et al., 2013) and of .92 in Italian. Cross-linguistic *Q*s with English, however, have been somewhat lower—namely, .51 for Greek (Papaeliou & Rescorla, 2011), .53 and .56 for Korean (Rescorla et al., 2013), .55 for Italian (Rescorla et al., 2014), and .50 for Portuguese (Rescorla et al., 2016). Overall, these results show that when independent samples of children in a country are acquiring the same language, there is very strong concordance among them with respect to word frequency (i.e., which words most children vs. few children acquire). Although still substantial, concordance is reduced in cross-linguistic LDS comparisons, probably because of linguistic and cultural differences.

Word Matches

Lexicons have also been compared with respect to *word matches*—namely, whether the same words (i.e., translational equivalents) are found among the highest frequency words in different languages. Across the four cross-linguistic LDS studies to date (Papaeliou & Rescorla, 2011; Rescorla et al., 2013, 2014, 2016), word matches between English and the other language have comprised roughly half of the words with the highest percentage use scores (i.e., the words acquired by the largest percentages of the children). This finding shows that children learning many different languages acquire many of the same words in their early vocabularies, suggesting some universality in what young children talk about (e.g., *milk, ball, cat, nose, car, bath, sleep, shoes, bye-bye, mommy, daddy, no, thank you*).

Late Talkers

When young children are slow to talk in the absence of a more primary condition, they are usually called late talkers. Cross-linguistic LDS studies to date (Papaeliou & Rescorla, 2011; Rescorla et al., 2013, 2014, 2016) indicate that late talkers identified by LDS vocabularies <50 words at ages ≥ 24 months were very similar in lexical composition to typically developing children of 18–23 months with <50 words, with *Q*s of .83 in the United States, .85 in Greece, .97 in Korea, .90 in Italy, and .78 in Portugal. Furthermore, many of the top words for the late talkers were also top words for vocabulary size-matched younger children (e.g., *juice, milk, ball, dog, shoes, no, yes, hi/hello, woof-woof, thank you, all gone, mommy, daddy, and baby*).

Characteristics of Polish

Polish is a Slavic language, unlike any of the languages previously studied with the LDS. Polish is morphologically

very rich (Dąbrowska & Tomasello, 2008; Smoczyńska, 1985). There are seven cases, each signaled by several different suffixes, and there are different sets of case inflections for singular and plural nouns. Gender of nouns also determines word endings. Verbs are inflected for aspect, voice, mode, person, number, and kind. Numerals, adverbs, and adjectives are also inflected. There are also many prefixes, suffixes, and interfixes, and word formation relies mostly on derivation (Haman, 2002, 2003). Polish phonology is especially difficult, with some very hard to pronounce sounds, including spirant consonants such as “sz” and consonant groups such as “szorstki.”

Smoczyńska et al. (2015) adapted the CDI into Polish, following the guidelines of the CDI’s advisory board (Dale, 2015; Dale & Penfold, 2011) to remain as close as possible to the original CDI while being consistent with their own language and culture. They used Polish language diary data as well as data for Polish child-directed speech in the adaptation process. Normative data for the Polish CDI have been collected, but to our knowledge, no studies reporting Polish CDI findings have been published in English. However, when Polish CDI scores (Smoczyńska et al., 2015) were compared with CDI data presented in CLEX (Jørgensen, Dale, Bleses, & Fenson, 2010), it emerged that Polish scores were lower than English, Danish, Italian, Spanish, Norwegian, Russian, Turkish, and Croatian scores but similar to German scores, suggesting that Polish is one of the more difficult languages for young children to acquire.

Rationale and Goals of the Current Study

The current study compared vocabulary development in 24-month-old children learning Polish with that of U.S. children in the same age range learning English. Our first hypothesis, which was based on the well-documented difficulty of Polish, posited that Polish LDS scores would be significantly lower than English scores. However, our other hypotheses assumed that Polish would show the same patterns as other languages studied with the LDS. Specifically, we predicted that Polish would show wide individual differences in vocabulary size and a gender difference favoring girls. We also predicted a *Q* correlation of about .50 with English, more nouns than verbs, and word matches comprising about half of the highest frequency words based on the lexical composition patterns found in other LDS studies. Finally, we anticipated that the *Q* correlation for vocabulary concordance would be high among Polish children with <50 words and those with ≥50 words, but this hypothesis was more tentative given that we did not conduct this exact comparison in previous cross-linguistic LDS studies.

Method

Participants

Polish Sample

The Polish sample consisted of 199 children (109 boys and 90 girls) who were 24 months of age ($M = 24.21$, $SD = 0.71$, range = 21.57–25.71 months). Most of the children (80%) were from the city of Krakow, and the other

20% were from the suburbs around Krakow. Most parents were university graduates (76%). The children were part of a cohort of 345 monolingual children who were studied longitudinally from 12 to 42 months for mentalizing ability. Before the child’s second birthday, parents of all participants were invited to complete the Polish LDS and return it within 1 month of the 24-month lab visit. A total of 256 parents replied, but only 199 parents sent back complete forms within the required time period. A month after sending in a completed LDS form, 90 of the 199 parents were asked to complete the LDS again, and 71 usable forms were returned (29 girls, 43 boys; $M = 26.20$, $SD = 0.71$, range = 24.07–27.53 months). The 199 children with a complete LDS were seen for an extensive lab visit at 24 months, during which a 5-min count of spontaneous utterances was made.

U.S. Sample

The U.S. sample was obtained from four school districts in suburban areas outside of Philadelphia (Rescorla & Alley, 2001). Children were recruited from school census lists maintained by each district and screened in their homes while their mothers completed the LDS. The sample (50% boys, mostly White and from middle to upper class families) consisted of 422 children ($M = 24.69$, $SD = 0.78$, range = 23.11–24.62 months).

Measures

The Polish LDS

We first translated the 310 words into Polish and checked them against a back-translation. We then identified words needing replacement, with the goal of minimizing replacements while producing a culturally and linguistically appropriate adaptation. After we reviewed a previous LDS Polish adaptation and the Polish adaptation of the CDI (Smoczyńska et al., 2015) as well as obtaining input from 10 English-speaking Polish mothers of children age 22–26 months, we replaced 42 words in the same semantic categories. Replacements were generally made because the referent was uncommon for Polish children, the word was too hard to pronounce, or two English words had the same Polish translation (see online Supplemental Material S1).

Utterance Count

During the lab visit, each child performed tasks relevant to the larger study. For 5 min of this visit (involving a “snack delay,” a “frustration” task, and a “self-conscious emotion” task), observers counted the number of spontaneous single-word or ≥2-word utterances that the child used communicatively, even if not fully intelligible. Interrater reliability for this utterance count on the basis of double-coding of 20% of the videos was $r = .83$ ($p < .001$).

Results

Psychometric Results

Test–retest reliability for the 71 parents who completed the Polish LDS twice was .92 ($p < .001$), which is similar to

Rescorla and Alley's (2001) r of .97. Parents reported significantly more words on the retest LDS than the first LDS completed a month earlier (169 vs. 132 words), $t(70) = 8.71$, $p < .001$, supporting the instrument's construct validity by showing an age increase in vocabulary. Internal consistency of the Polish LDS ($N = 199$) of $r_{KR20} = .99$ ($p = .001$) was comparable with the Cronbach's alpha of .99 reported by Rescorla (1989).

Of the 199 children in the Polish sample, 181 used at least one spontaneous utterance. Single words composed 74% of all spontaneous utterances ($M = 7.56$ words, $SD = 6.33$, range = 0–42), whereas utterances of ≥ 2 words composed 26% of all spontaneous utterances ($M = 3.64$ utterances, $SD = 5.58$, range = 0–34). For the 181 children with some utterances, the percentage of single words had a negative correlation of $-.53$ with LDS score ($p < .001$), whereas the percentage of multiword utterances had a positive correlation of $.53$ with LDS score ($p < .001$); this result indicated that children with more advanced utterances had higher mother-reported LDS scores. For these 181 children, the total number of utterances used in the 5-min period correlated $.37$ ($p < .001$) with LDS score; however, for the full sample of 199 (which included 18 more children, all with zero utterances), total LDS score correlated $.55$ ($p < .001$) with the number of spontaneous utterances. In summary, the Polish LDS had strong test–retest reliability and internal consistency as well as good construct validity and moderate concurrent with an admittedly simple speech measure, indicating good psychometric properties.

Vocabulary Size Results

To test our hypotheses regarding vocabulary size, we used a 2 (language) \times 2 (gender) analysis of variance on LDS vocabulary scores. Consistent with our first hypothesis, the English LDS score ($M = 184.19$, $SD = 86.27$, 0–310 words) was substantially higher than the Polish LDS score ($M = 133.50$, $SD = 89.46$, 7–308 words), $F(1, 617) = 45.53$, $p < .001$, $\eta_p^2 = .07$ (i.e., percentage of variance accounted for, with other effects partialled out), $d = 0.58$ (i.e., standardized mean difference). Consistent with our second hypothesis, individual differences were large in both languages ($SDs > 80$ words); girls ($M = 186.36$, $SD = 84.47$, 7–310 words) had higher LDS scores than boys ($M = 150.73$, $SD = 92.45$, 0–310 words), $F(1, 617) = 16.34$, $p < .001$, $\eta_p^2 = .03$, and the Gender \times Language interaction was not significant, $F(1, 617) = 2.02$, $p = .156$, $\eta_p^2 \leq .01$. Thus, Polish LDS results yielded the same wide variability as found in English as well as the same gender difference favoring girls.

There were striking Polish–English differences at the upper and lower ends of the LDS vocabulary size distribution: < 50 words (18% vs. 8%), 50–99 words (28% vs. 12%), 100–149 words (16% vs. 15%), 150–199 words (13% vs. 15%), 200–249 words (10% vs. 22%), and ≥ 250 words (16% vs. 28%), $\chi^2(5) = 52.52$, $p < .001$. These results suggest that it takes longer for toddlers to acquire 200 words in Polish than in English, supporting its difficulty as a language.

In an additional analysis, we listed all words in descending order of percentage use score by language. There were 23 Polish and 54 English words with scores $\geq 75\%$ (i.e., used by at least 75% of the children), but 45 Polish and only six English words were reported for $< 25\%$ of the sample. Also, fewer Polish than U.S. children were reported to use many of the words with the highest LDS scores in both languages, such as *eye* (71% vs. 92%), *baby* (77% vs. 94%), *ball* (74% vs. 95%), *shoes* (64% vs. 91%), *bird* (64% vs. 84%), *duck* (68% vs. 81%), *juice* (61% vs. 93%), *banana* (66% vs. 87%), *hat* (60% vs. 78%), *nose* (62% vs. 86%), and *balloon* (63% vs. 85%).

In sum, our vocabulary size findings suggest that Polish is more difficult to learn than English; this finding is reflected in a lower mean total LDS score at age 2 years, smaller percentages of children with > 200 words, more words with low percentage use scores and fewer words with high percentage use scores, and lower percentage use scores for many of the most commonly reported words.

Vocabulary Composition

We summarize below results from the three analyses conducted to test our third hypothesis that lexical composition would show the same patterns found in other LDS studies.

Q Correlations of Percentage Use Scores

To test Polish–English concordance, we used the percentage use scores for the 310 LDS words in each language—namely, the percentage of children in each sample reported to use each word. We excluded the 42 replaced words from these analyses because the Q correlation must be calculated with the same items. We then correlated these 268 percentage use scores, obtaining a Q of $.44$ ($p < .001$); this value indicates a medium effect according to Cohen's (1988) benchmarks for correlations. Thus, results indicated moderate cross-linguistic concordance but suggested that some words commonly reported for U.S. children were not as commonly reported for Polish children, and vice versa.

Noun Versus Verb Percentages

We next calculated the percentages of nouns and verbs in the “top 100” words in each language on the basis of percentage use scores (103 words in English and 102 words in Polish, because of ties). The Polish noun percentage was 64.7% (66 nouns) compared with 69.9% (72 nouns) in English—a nonsignificant difference. For the “top 50” words, noun percentage appeared to be lower in Polish (62%) than in English (78%), but the chi-square was not significant. Verb percentages were 7.8% in both languages for the top 100 words, with the remaining words being modifiers, pronouns, social words, prepositions/particles, and sounds.

Word Matches

We found 55 word matches among the Polish and English words with the top 100 percentage use scores (103 words in English and 102 for Polish, because of ties). As can be seen in online Supplemental Material S2, these concordant words included foods (e.g., *apple*, *cake*, *milk*);

toys (e.g., *ball, balloon, swing*); animals (e.g., *cat, dog, bird*); body parts (e.g., *hair, ear, nose*); vehicles (e.g., *car, plane, train*); action words (e.g., *sleep, go*); household items (e.g., *clock, door, telephone*); modifiers (e.g., *dirty, more, mine*); clothing items (e.g., *hat, shoes*); people words (e.g., *grandpa, mommy, daddy, baby*); and various social words, pronouns, and animal sounds (e.g., *bye-bye, yes, thank you, no, meow, me*).

Vocabulary Composition in Children With <50 Words

The criterion of fewer than 50 words on the LDS yielded 18.1% of the Polish sample (36 out of 199 children) and 8.3% of the U.S. sample (35 out of 422 children), $\chi^2(1) = 11.87, p = .001$. Although previous studies have used <50 words at 24 months as the criterion for late talkers, the fact that 18% of the Polish sample had <50 words suggests that they are not “true” late talkers but rather just the lower quintile of a vocabulary distribution shifted downward because of the difficulty of Polish. This speculation is supported by the fact that the mean LDS vocabulary score for the 36 Polish children with <50 words was significantly higher ($M = 30.06, SD = 12.83, 7\text{--}48$ words) than that for the 35 U.S. children with <50 words ($M = 21.0, SD = 13.17, 0\text{--}48$ words), $t(69) = 2.94, p = .01$.

Q Correlations of Percentage Use Scores

The *Q* correlation between percentage use scores for children with <50 words and the rest of the sample was .72 in Polish and .61 in English (both $ps < .001$). These correlations show that children acquiring words at different rates have very similar LDS vocabulary composition in both languages.

Noun Versus Verb Percentages

For children with <50 words, 55.8% of the top 50 Polish words were nouns (29 out of 52 words), and 65.4% of the top 50 English words were nouns (34 out of 52 words). For both groups, verbs composed only 5.8% of the top 52 words. For the children with ≥ 50 words, 58.8% of the top 51 Polish words were nouns (30 nouns), and 76.9% of the top 52 English words were nouns (40 nouns). Verbs composed only 5.9% of the top 51 Polish words and 3.9% verbs of the top 52 English words. Thus, in both languages, children with <50 words and those with ≥ 50 words showed noun dominance, but noun dominance was greater for children with larger versus smaller vocabularies in English only.

Word Matches

There were 39 word matches (out of 51 words, 76.5%) for the Polish children with <50 words and their peers with ≥ 50 words, including many “other” words (*yum-yum, yes, woof-woof, there, no, myself, meow, hi/hello, here, bye-bye*), many people words (*own name, mommy, man, grandpa, grandma, daddy, baby, aunt*), many animals (*horse, dog, duck, cow, cat, bird*), several action words (*sleep, pee-pee, peekaboo, give, eat*), some toy words (*teddy bear, dolly, ball*), a few food words (*food, egg, drink*), two modifiers

(*this, all gone*), and one vehicle word (*car*). Similar to the Polish sample, there were 38 word matches for the children with <50 words and those with ≥ 50 words in the U.S. sample. Finally, there were 22 words present in the vocabularies of children with <50 words in both Polish and English: *daddy, mommy, no, ball, bye-bye, baby, hi/hello, dog, yes, grandma, car, cat, grandpa, duck, balloon, boo-boo, down, bird, all gone, doll, me, and bus*.

Discussion

Our LDS results revealed many similarities between Polish and English early vocabulary development—notably, large individual differences in vocabulary size among children of the same age and a significant gender effect (girls > boys)—replicating many other studies. However, vocabulary acquisition was significantly slower in Polish than in English, as indicated by a smaller mean LDS score, more children with <50 words, and fewer children with >200 words. These findings suggest some language-specificity because of the complexity of Polish, as argued by Bleses et al. (2008) for Danish. Confirmatory evidence for the difficulty young children have learning Polish is that 24.6% of 2-year-olds had <50 words on the Polish CDI, (Smoczyńska et al., 2015), according to the Polish CDI manual. That the percentage use score was often lower for a Polish noun than for the same noun in English suggests that Polish nouns may be especially hard to learn, which may explain why the Polish–English noun percentage difference was greater for the top 50 words (62% vs. 78%) than for the top 100 words (65% vs. 70%), although neither difference was significant.

Although we interpret our results as indicating that Polish, like Danish, is difficult to learn and so young children acquire Polish vocabulary more slowly than children acquiring English, other explanations for our results are also possible. For example, it could be that Polish LDS scores are lower because the 310-word LDS did not contain words commonly learned by young Polish children (perhaps because these words are not present in the English version and hence were not translated). However, this seems unlikely to be the cause of our lower LDS scores, given that Smoczyńska et al. (2015) also found slower acquisition using the Polish adaptation of the CDI, which has >600 words. However, another possible explanation that we cannot rule out is that the Polish mothers in our sample, or Polish mothers in general, set a higher threshold for deciding that a child is producing a word, which would also result in lower LDS scores. Thus, it may be possible that Polish parents may be more strict than U.S. parents regarding what they credit as words, a possible response tendency exacerbated by the complexity of Polish phonology that makes clear articulation hard in children who are just beginning to talk.

With respect to lexical composition findings, the *Q* correlation for Polish and English words (.44) was slightly smaller than those from previous LDS studies (Papaeliou & Rescorla, 2011; Rescorla et al., 2013, 2014, 2016), which were all $\geq .50$. We speculate that the large number of Polish

words with very low percentage use scores may have attenuated the cross-linguistic correlation. As in previous LDS cross-linguistic studies, noun dominance was found for the 100 words with highest percentage use scores. As predicted, more than 50% of the top 100 words were matches between the two languages, including many words commonly matched in previous LDS studies (e.g., *apple, milk, ball, cat, dog, ear, nose, car, train, bath, sleep, clock, door, hat, shoes, bye-bye, yes, thank you, no, grandpa, mommy, daddy, baby*).

The *Q* correlations for percentage use scores between children with <50 words and children with ≥50 words were large but smaller than those reported in previous LDS cross-linguistic studies, most likely because we did not have a vocabulary size-matched younger comparison group in these samples of 2-year-olds. Polish children with <50 words had 39 word matches with their peers using ≥50 words. Both indices of concordance (the *Q* and the word matches) show that children acquiring Polish words more slowly are acquiring the same words as their peers moving more quickly in vocabulary acquisition.

Our moderate concordance in vocabulary composition, clear noun dominance, and numerous word matches are consistent with findings in other LDS studies. Furthermore, Polish children with slower versus faster vocabulary acquisition were generally acquiring the same words. These vocabulary composition results, considered in the context of previous LDS studies, suggest that children learning a variety of different languages acquire many of the same words early in the acquisition process, suggesting some universality in what young children talk about.

Limitations and Conclusions

We could not test age effects in Polish or compare Polish with English LDS scores for children younger or older than about 24 months. Also, neither sample was representative of its national populations in socioeconomic status, and the U.S. sample was not representative for race/ethnicity. As in previous LDS studies, the assignment of words to noun or verb classes was based largely on their placement in the checklist. Finally, because the LDS is a parent-report checklist, somewhat different results might emerge from direct vocabulary testing of the child or from speech sample data. Because we used essentially the same instrument for both languages (albeit with modifications in 42 out of 310 words), we could make statistical comparisons of vocabulary size and vocabulary composition between large Polish and U.S. samples and compare these findings with previous cross-linguistic LDS studies. However, this etic methodology did not allow us to study unique characteristics of Polish language development, which would require using an *emic* method appropriate for small samples, such as language diaries or speech samples.

Our results reveal some cross-linguistic differences between Polish and English, suggesting language-specific features, but also many cross-linguistic similarities, which signifies some universality. In future research, a Polish sample that is more representative in socioeconomic status

and with the full age range for the LDS (18–35 months) should be compared with the U.S. normative sample to see whether lower Polish LDS scores are found in each age group (18–23, 24–29, and 30–35 months).

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