

# ISSUES IN THE DIAGNOSIS OF SLI IN GREEK CYPRIOT BILECTAL CHILDREN

ELENI THEODOROU<sup>a,c</sup>, MARIA KAMBANAROS<sup>b,c</sup>, AND KLEANTHES K. GROHMANN<sup>a,c</sup>  
*<sup>a</sup>University of Cyprus, <sup>b</sup>Cyprus University of Technology, <sup>c</sup>Cyprus Acquisition Team*

It is important to investigate children's language skills in their native linguistic variety because diagnosis, and intervention (therapy), cannot be based on findings from other languages or varieties which have different properties. Likewise, all first language assessments must be appropriate for children who acquire their native variety — in the present study, Cypriot Greek (CG). This paper assesses the utility of existing tools in the diagnosis of specific language impairment (SLI) in CG. In total, 16 children with SLI ranging from 5 to 9 years of age and 22 age-matched typically developing children participated in this study. Results showed that the existing tools can be used to identify children with SLI, but only when the comparison is between children that use the same variety. However, a proper adaptation to CG is needed, given that due to cultural and linguistic differences, not all the stimuli from the Standard Greek versions were equally appropriate for Greek Cypriot children, who are here termed bilectal in the two linguistic varieties.

## 1. Specific Language Impairment

Language acquisition is one of the most robust yet intrinsic processes of early childhood. However, not all children acquire language fully or even effortlessly. The term 'specific language impairment' (henceforth, SLI), the main interest of the current study, is applied to children who exhibit a significant deficit in language ability yet display normal hearing, age-appropriate scores on tests of non-verbal intelligence, and no obvious signs of neurological damage or social-emotional deprivation.

Many tools and multiple resources have been employed by both clinicians and researchers in order to integrate information and then to set the diagnosis of SLI. So information might be collected either from clinical observation and informal test administration or from interviews of parents and teachers. In addition, they assemble clues from norm-referenced language tests that tap into the different language components (such as morphology, phonology, syntax, semantics, and pragmatics as well as the lexicon), when and if there are available. In combination with established knowledge about atypical and delayed language development, this leads to the diagnosis of the language impairment.

It is possible to diagnose SLI adequately only after the age of 4, given that many children presenting signs of a ‘delay’ in language development are ‘late bloomers’ who manage to catch up with typically developing children (Rescorla, 1989). An epidemiological study showed that the incidence of SLI is around 7% among preschoolers, with males more affected than females (Tomblin et al., 1997), whereas only 29% of the parents of children with SLI had been previously informed about their children’s language problem (Tallal et al., 1989). Thus, 70% of affected children were not identified or diagnosed, and thus not enrolled in clinical services. The risk of not diagnosing the disorder, in populations where there are no available norm-referenced tests, becomes even higher. For many individuals, language deficits persist in later childhood, adolescence, and even adulthood (e.g. Aram and Nation, 1980; Paul et al, 1983; Nippold and Fey; 1983; Ullman and Gopnik, 1994). In addition, follow-up studies have shown that language problems are associated with social difficulties which are still evident in adolescence and adulthood (Clegg et al, 2005) as well as general learning difficulties (Snowling et al, 2001).

### **1.1. Diagnosing SLI in Greek Cypriot children**

Due to a lack of standardized testing tools that are valid and reliable, diagnosing language impairment in Greek Cypriot children is not straightforward. These children are considered ‘(discrete) bilingual’ (Rowe & Grohmann, 2012), growing up with Cypriot Greek (CG) as their native variety alongside Standard Modern Greek as the official language. The lack of language assessment tools for CG language capabilities, particularly in the preschool and early school years, often creates difficulties in credible and objective diagnosis of speech, in assessing the severity of language impairment, in the documentation of progress of speech therapy treatment, and finally in completion of the language services. This problem is well known among speech and language therapists, as well as to scientists who conduct research.

A number of norm-referenced tests have been published in order to evaluate language abilities of (Standard) Greek-speaking children. These include the Diagnostic Verbal IQ Test (Tsimpli & Stavrakaki, 2000), the Word Finding Test (Vogindroukas et al., 2009a), the Test of Language Comprehension and Production (Vogindroukas et al, 2009b), Action Pictures (Vogindroukas et al, 2011), the Greek Phonological Test (Levanti et al, 1998), the Metaphon Test (Giannetopoulou and Kirpotin, 2007), and the Athina Test (Paraskevopoulos et al, 1999). In addition to these, several translations and adaptations of English tests with no Greek norms are in use in clinical practice, but their results are (or should be) taken only as indicative. These tests are used extensively by speech and language therapists in Cyprus, but the use of these tests is disputed because of the difference in dialect and culture. However, Thordardottir et al. (2011) suggested the differences may not always be so important so as to rule out the use of such tests, and that only some modifications would be required, this suggestion cannot be blindly adopted. Thus, in order for this suggestion to be applied an examination of these tests is needed even though the issue was not addressed for the language on which the measurements were designed.

Consequently, diagnostic practices with CG-speaking children do not rely on standardized tests. Due to the absence of relevant measures, clinicians who evaluate the language skills of CG-speaking children are conveyed to diagnosis grounding on subjective criteria, informal tests and translations of standardized tests. Thus their recommendations comprise the interpretation of informal and subjective assessment. Given that the diagnosis is based on descriptive information and clinicians’ subjective judgment, the consistency of diagnosis thus cannot always be achieved.

All in all, the diagnostic practices with Greek Cypriot children differ markedly from those used with speakers of other languages, especially English, where specialists can rely on test measurements. Instead, emphasis is placed on qualitative assessments as well as on subjective judgment of clinicians as well as researchers. These procedures are based not only on clinical experience but on the knowledge that therapists gain during their formal training regarding SLI.

Therefore it is essential to investigate Greek Cypriot children with SLI. There is a great need to avoid confusion between language variation attested in dialectal situations and those which are the result of language impairment. The tests which were designed to assess the language abilities of children speaking the standard variety have been (rightly) criticized (Battle, 1996; McGregor et al, 1997; Seymour et al, 1998; Wyatt, 2002), and the necessity for developing appropriate diagnostic tools which would differentiate the dialectal variation from language impairment has emerged. Furthermore, these tests are essential to take into account linguistic characteristics of the dialect under evaluation and potential cultural differences (Oetting & McDonald, 2001; Washington and Craig, 2004).

## 2. The Study

In this study, we aim to contribute to the investigation on the identification of appropriate language diagnostic tools that can diagnose SLI. Thus the objectives of this study are: (i) to identify which of the existing tools can identify children with SLI, and (ii) to define the differences between children with SLI and typically developing chronological age-matched children in a group of diagnostic measurements.

### 2.1. Participants

A total of 38 CG-speaking children aged 5 to 9 years participated in this study. The children were divided into four groups: two groups each of children with SLI and age-matched typically developing (TD) children. The younger group of children with SLI included 9 (7 boys and 2 girls, mean age 5;6, SD 0;3), and the older group 7 children (3 boys and 4 girls, mean age 7;8, SD 0;8). The younger group of TD children included 10 (6 boys and 4 girls, mean age 5;8, SD 0;6), and the older group 12 children (6 boys and 6 girls, mean age 7;10, SD 0;6). See table 1.

Group	Age Range	Num. of Participants	Mean	Stand. Dev.	Gender
TD1	4;5–6;6	10	5;8	0;6	6M, 4F
TD2	6;7–8;7	12	7;10	0;6	6M, 6F
SLI1	4;11–5;11	9	5;6	0;3	7M, 2F
SLI2	6;7–8;1	7	7;8	0;8	3M, 4F

Table 1: Participant details

Subject selection criteria included: (i) a ‘monolingual’ CG-speaking background (i.e. bilingual in CG and SMG), (ii) no history of neurological, emotional, developmental, or behavioral problems, (iii) hearing and vision adequate for test purposes, (iv) normal performance on a measure of non-verbal intelligence, (v) no gross motor difficulties, and (vi) medium to high socio-economic status. All the above information was obtained either from their speech therapists and teachers or from their parents.

All children were from urban Limassol and surrounding areas. Parental consent forms and an informative letter were distributed, and only those children whose parents approved took part in the investigation. TD children were recruited from public (pre-)primary schools with permission from the *Centre of Educational Research and Evaluation*. According to their teachers and parents, participants in the control groups were typically developing in all respects. None of the children had a referral from or underwent treatment by speech and language therapists.

Children with SLI were recruited through speech and language therapists either in private settings or in mainstream public schools. Two certified speech and language therapists who work in two private settings in Limassol were asked to refer children for this study that showed marked language impairment in the absence of any other difficulty. Given that the practices in terms of diagnosis might be different among the clinics, it is essential for researchers of SLI to document their criteria well for the diagnosis. Thus, the protocol used for the current study includes the previous identification of the participants by certified speech and language therapists based on case history, informal testing in terms of comprehension and production, analysis of language samples, and observation. Before any referral, the first author, a trained and licensed speech and language therapist with clinical experience of 11 years, thoroughly informed the therapists who referred participants for the purposes of this research about the expected difficulties of the children based on the criteria included in DSM-IV (2010) and Leonard (1998). Meetings with the therapists were also arranged to provide them with a detailed description of the research and to answer their questions. Thus, in the present study, the standard for determining each participant's status as impaired or not involved a combination of clinical judgment and informal testing.

## 2.2. Material

For those children whose language is primarily impaired, language evaluation is essential to ensure that they will be diagnosed correctly and then receive the appropriate services that they need. In the absence of guidelines in determining whether a child presents SLI or not, research (Theodorou et al., in progress) showed that speech therapists in Cyprus use a number of available Greek tests and tests translated from other languages for the diagnosis of language impairment.

Acknowledging the importance of assessing language skills using formal tests that target specific language domains, a group of available language tests were examined mirroring also the clinical tradition. The intention was to cover the major domains of language that are mentioned as affected in the SLI literature in order to enable an inclusive assessment.

The following paragraphs present briefly the battery of tests used which had been designed to evaluate language performance of children, evaluating both modalities, comprehension and production, and the test used to determine the intellectual abilities of participants.

### 2.2.1. Raven's Coloured Progressive Matrices (Raven, Raven & Court, 1998)

The use of a non-verbal IQ test is essential for the diagnosis of SLI to rule out any intellectual deficiency. The Raven Coloured Progressive Matrices was designed for use with children for anthropological studies and for clinical work. It assesses as accurately as possible a child's level of intellectual development. It has subsequently found wide application in educational, clinical, and occupational settings. The psychometric indicators of reliability and validity are high for the particular test.

The test presents the child with a series of patterns from which a piece is missing. The child

is instructed to select, among six alternative pieces, the single piece that can complete the pattern. Children's answers are scored as correct and incorrect, and the total score is compared to an age-matched population.

### 2.2.1. The Bus Story Test (Renfrew, 1997)

The Bus Story Test (BST) is a screening test of verbal expression that examines story retelling with picture support. It can demonstrate difficulties with verbal expression, as well as phonological, semantic, grammatical, and sequencing problems. The BST was designed to be used by speech and language therapists as well as psychologists. It can be given to children ranging from 3 to 8 years of age and to adults who have learning difficulties. The BST is a standardized procedure in the UK used frequently by speech and language therapists. It has been translated and used widely in Greece as well.

With regards to administration, the experimenter tells each child the short story of a red bus, while the child is looking through the picture book illustrating the story, and then the child is requested to retell the story as close to the original as possible. The child then retells it while looking at the pictures.

The narrative samples were transcribed and then utterances were divided into sentences and evaluated with respect to five measures, three that the BST suggests and two additional ones. The measures used are the following:

1. *Information*: The semantic complexity is measured using a norm-referenced information score that the BST provides.
2. *Subordinate Clauses*: After each narrative was divided into sentences following Scott's (1988) criteria, the produced subordinate clauses were counted.
3. *A5LS*: When the narratives were transcribed, they were divided into sentences (T-units); then the MLU-word was calculated and the mean of the five longest sentences were computed.
4. *MLU-word*: In the absence of normative data for mean length of utterances in CG, it was calculated based on words for each narrative (MLU-word); all words were added up and the sum was divided by produced sentences.
5. *T-units*: This measure forms the total number of used sentences (T-unit).

### 2.2.3. Developmental Verbal IQ Test (Tsimpli and Stavrakaki, 2000)

Children's language abilities were also measured using the Developmental Verbal IQ Test (DVIQ) which is the only existing test that examines language development in SMG. The DVIQ measures various aspects of language skills concerning comprehension and production. It consists of five sub-parts that test vocabulary, comprehension of morphosyntax, production of morphosyntax, metalinguistic concepts, and sentence repetition.

The DVIQ was designed to be used by language researchers and clinicians. The whole procedure of the test was presented as a game. The child was asked to name pictures, to show which picture depicted the situation that the researcher described, and to repeat sentences after the researcher. The child's answers were recorded on the answer sheets of the tests; they were then scored and analyzed later.

#### 2.2.4. Athina Test (Paraskevopoulos et al, 1999)

The Athina Learning Disabilities Diagnostic Test is a set of individual diagnostic tests. It assesses individual level and pace of development of a child in different areas, namely in terms of intellectual ability, immediate memory sequences, completion of incomplete performances, writing-phonological awareness, and neuro-psychological maturity. For the purposes of the study, children were tested on the two tasks, vocabulary (definitional skills) and sound discrimination. Therefore, the vocabulary sub-scale, which assesses the degree of organization of concepts by the child, was selected to be used in the diagnostic part of the study. The phonological awareness was measured using the sound discrimination task. The participants were asked to judge whether pairs of non-words, spoken by the researcher are identical or different. The experimenter said each pair of non-words aloud, obscuring the view of her lips with a piece of paper while saying the non-words.

#### 2.2.5. Peabody Picture Vocabulary Test (Dunn and Dunn, 1981)

The Peabody Picture Vocabulary Test (PPVT) was used in order to assess children's receptive vocabulary skills. The PPVT measures receptive language abilities of individuals of different ages. In addition, it provides an estimate of the individual's verbal intelligence or scholastic aptitude. For its administration, the researcher presents a series of pictures to each participant. There are four pictures to a page, and each is numbered. The researcher utters a word describing one of the pictures and asks the child to point to or say the number of the picture that the word described.

#### 2.2.6. Greek Phonological Test (Levanti et al, 1998)

The Greek Phonological Test was used to assess phonological skills of all participants. It is an individually administered test designed to assess phonological skills in Greek-speaking children. The assessment procedure is designed in order to provide an overview of phonological abilities of a child. This measure was included because the literature suggests that the majority of children who are diagnosed as having phonological problems show problems in other components of language as well (Paul and Shriberg, 1982, Ruscello et al, 1991; Leonard, 1998). The test is the only one that appears in Greek and tests phonological skills, and it was developed and standardized in Greece (Levanti et al, 1998). No norms exist so far for CG. Participants needed to name pictures in one word. The child's answers were recorded on the answer sheets of the tests using IPA and were audio recorded to be confirmed later on. For the purposes of the study, the responses were scored as correct or incorrect.

#### 2.2.7. Word Finding Test (Vogindroukas et al, 2009a)

In order to assess children's naming ability, the Word Finding Test was administered. It assesses the extent to which pictures of objects could be named correctly. Concepts illustrate everyday objects, known categories of objects, concepts of childhood fairy tales, and children's television programs. The responses were recorded by the researcher during testing on the score sheet and then scored as correct or incorrect. Because of the lexical differences between SMG and CG, a list with alternative correct words was used for scoring.

### 2.3. Procedure

Children were assessed individually in three to five sessions either within schools, in speech and language clinics, or in a quiet room in their homes across a period of one to three months. The order of task presentation varied across participants and testing on all tests was completed at the child's own pace, no time limitations were imposed. Participants could ask for breaks at any stage during any session, and they could also ask any particular visit to end. The diagnostic tools were administered either by the first author or by a certified speech and language therapist under the first author's close supervision. Scoring of the tests was conducted by the first author and then checked by the second author.

When necessary, the sessions were audio-recorded using an Olympus digital voice recorder with a high quality built-in microphone. Before starting the first session, the experimenter had a short chat with the child introducing themselves and explaining what was going to happen in order to both inform the child about the whole procedure and to become familiar with the child. At the end of each session, the child received a small token (such as a sticker or a pencil).

### 3. Results

The mean performance of the younger TD and SLI group on the language tests including the significant levels based on the independent t-tests are displayed in table 2.

TESTS	MEAN (Standard deviation)		Sig (2-tailed)
	TD (10)	SLI (9)	
<b>DVIQ</b>			
Vocabulary	22.9 (2.18)	16.78 (2.82)	0.000*
Production: Morphosyntax	19.8 (2.1)	13.89 (2.71)	0.000*
Comprehension: Metalinguistic knowledge	19.9 (1.8)	18 (3.87)	0.180
Comprehension: Morphosyntax	25.4 (2.6)	24.56 (3.84)	0.578
Sentence repetitions	45.50 (2.51)	40.89 (2.47)	0.001*
TOTAL DVIQ	133.50 (7.63)	114.11 (10.45)	0.000*
<b>PPVT (Raw Scores)</b>	63.80 (11.73)	54.78 (16.55)	0.185
<b>Word Finding Test</b>	33.30 (5.14)	21.67 (2.74)	0.000*
<b>ATHINA Test</b>			
Definitions	15.44 (7.50)	7.78 (2.39)	0.016*
Phonemic discrimination	18.40 (3.41)	15.56 (6.29)	0.251
<b>Greek Phonological Test</b>	66.9 (3.14)	48.22 (9.76)	0.000*

<b>Bus Story Test</b>			
Information	35.80 (11.54)	21.78 (8.94)	0.009*
A5LS	8.44 (2.12)	5.40 (0.82)	0.001*
Sub. clauses	7.80 (4.10)	1.67 (1.5)	0.001*
No. of T-units	20.60 (3.89)	15.56 (3.75)	0.011*
MLU	4.70 (1.24)	3.39 (2.76)	0.013*

Table 2. Means, standard deviations, and significant levels of the two younger groups, TD and SLI (Key: TD=Typically Developing children, SLI=children with SLI)

A clear differentiation between the children with SLI and the TD children can be observed for several measures. Concentrating on table 2, we note that the majority of the measures yielded statistical significant differences at the  $p$  level used for these comparisons ( $p > 0.05$ ). The measures that yielded significant group differences included DVIQ Vocabulary ( $t(17)=5.325$ ,  $p=0.000$ ), DVIQ Production: Morphosyntax ( $t(17)=5.345$ ,  $p=0.000$ ), DVIQ Sentence repetitions ( $t(17)=4.031$ ,  $p=0.001$ ), DVIQ Total ( $t(17)=4.654$ ,  $p=0.000$ ), Word Finding Test ( $t(17)=6.046$ ,  $p=0.000$ ), Athina Test Definitions ( $t(16)=2.922$ ,  $p=0.01$ ), Greek Phonological Test ( $t(17)=5.747$ ,  $p=0.000$ ), BST Information ( $t(17)=2.936$ ,  $p=0.009$ ), BST A5LS ( $t(17)=4.030$ ,  $p=0.001$ ), BST Sub. clauses ( $t(17)=4.226$ ,  $p=0.001$ ), BST No. of T-units ( $t(17)=2.871$ ,  $p=0.011$ ), and BST MLU ( $t(17)=2.764$ ,  $p=0.013$ ). In contrast, no significant differences were yielded for the remaining tests: DVIQ Comprehension: Metalinguistic knowledge, DVIQ Comprehension: Morphosyntax, PPVT, and Athina Test Phonemic discrimination.

Significant differences between the two older groups of participants can also be observed, as illustrated in table 3.

<b>TESTS</b>	<b>MEAN (Standard deviation)</b>		<b>Sig (2-tailed)</b>
	TD (12)	SLI (7)	
<b>Raven's (Standard Score)</b>	94.58 (9.64)	95.71 (17.66)	0.880
<b>DVIQ</b>			
Vocabulary	24.67 (1.61)	20.57 (1.81)	0.000*
Morphosyntax	21.33 (1.37)	14.58 (1.9)	0.000*
Comprehension: Metalinguistic knowledge	22.58 (1.88)	19 (1.73)	0.001*
Comprehension: Morphosyntax	28.58 (1.38)	26.43 (2.23)	0.047*
Sentence repetitions	47.33 (0.985)	42.29 (2.36)	0.000*
TOTAL DVIQ	144.50 (4.17)	122.86 (6.31)	0.000*
<b>PPVT (Raw Scores)</b>	93.67 (25.87)	72.86 (16.59)	0.074
<b>Word Finding Test</b>	38.25 (3.70)	27.71 (4.82)	0.000*
<b>ATHINA Test</b>			
Definitions	21 (6.92)	9.17 (0.98)	0.000*
Phonemic discrimination	25.33 (3.5)	16.71 (5.38)	0.001*
<b>Greek Phonological Test</b>	69.67 (0.49)	66.14 (2.67)	0.000*



<b>Bus Story Test</b>			
Information	46.42 (8.87)	29.00 (8.21)	0.001*
A5LS	9.57 (2.36)	7.86 (1.9)	0.122
Sub. clauses	9 (3.02)	5.57 (1.9)	0.015*
No. of T-units	20.50 (3.32)	20.14 (4.02)	0.836
MLU	5.24 (1.31)	4.64 (1.14)	0.326

Table 3. Means, standard deviations, and significant levels of the two older groups, TD and SLI (Key: TD=Typically Developing children, SLI=children with SLI)

Turning to the older group, the measures that revealed significant differences are slightly different. These measures include: DVIQ Vocabulary ( $t(17)=5.104$ ,  $p=0.000$ ), DVIQ Production: Morphosyntax ( $t(17)=9.005$ ,  $p=0.000$ ), DVIQ Comprehension: Metalinguistic knowledge ( $t(17)$ ,  $p=0.001$ ), DVIQ Comprehension: Morphosyntax ( $t(17)=2.625$ ,  $p=0.018$ ), DVIQ Sentence repetitions ( $t(17)=6.59$ ,  $p=0.000$ ), DVIQ Total ( $t(17)=9.050$ ,  $p=0.000$ ), Word Finding Test ( $t(17)=5.367$ ,  $p=0.000$ ), Athina: Definitions ( $t(17)=4.109$ ,  $p=0.001$ ), Athina: Phonemic discrimination ( $t(17)=4.257$ ,  $p=0.001$ ), Greek Phonological Test ( $t(17)=4.528$ ,  $p=0.013$ ), BST Information ( $t(17)=4.239$ ,  $p=0.000$ ), and BST Sub. clauses ( $t(17)=2.694$ ,  $p=0.015$ ). Conversely, the measures that did not approach significant differences levels are PPVT, BST A5LS, BST No. of T-units, and BST MLU.

Summing up, it was observed that the attested groups differ significantly on a number of assessment tools, as was expected in view of the clinical profiles shown by participants at the time of testing. It should be noted that only the production sub-tests of the DVIQ exhibited significant differences for the younger groups, whereas all DVIQ sub-tests exhibited significant differences for the older group, even though the version of the test used was originally designed for the assessment of preschoolers. The reverse happened for the measurements of the BST: All measurements (Information, A5LS, No. of subordinated clauses, No. of T-units, MLU) yielded significant group differences for the younger but not for the older group, where significant differences were revealed for the relevant information provided and for the number of subordinated clauses used. As for the Word Finding Test and the Greek Phonological Test, the scores in both approached significant levels of differences for the younger and the older children. The performances on the definition task from the Athina Test differed significantly for the attested groups, while the performance on the Phonemic Discrimination task revealed significant differences only for older groups. Lastly, the PPVT task did not yield significant differences for any of the groups although it is the most widely used assessment tool of receptive vocabulary for children with language impairment, as evidenced by both clinical report and research investigations (e.g. Evans et al., 2009; Betz & Sullivan, 2010; Preston & Edwards, 2010).

## 4. Discussion

The inexistence of appropriate language assessment tools for CG not only makes the clinical assessment difficult, but it also creates confusion among policy-makers, teachers, and clinicians alike, who conceptualize the kind and nature of language impairment differently. The difficulty found in other populations as well (Thordardottir et al., 2010) constrains both the definition and the detection of the impairment. The very first step towards improving the rate of intervention for

children with SLI is the appropriate identification of the impairment. The aim of this part of the study was to place the foundations for the diagnosis of SLI in CG-speaking children. It was intended to demonstrate whether Greek Cypriot children with SLI perform differently than age-matched peers on the available language tests.

The study showed that children with SLI, as previously identified, performed significantly lower than their age-matched TD peers on the majority of the measurements under examination, as depicted in tables 2 and 3 . The differences in performance between children with SLI and TD children were generally quite large. These group differences show that Greek Cypriot children diagnosed with SLI have a deficient performance across the different areas of language, including phonology, semantics, morphology, and syntax as well as in narration, which is an alloy of all the above, suggesting that language differences in SLI may be observed at different levels of language. On the other hand, this finding suggests that Greek Cypriot children who are characterized as having SLI probably experience problems at various levels of language. Consequently, the information that the tests provide to clinicians about the children's language situation can be used for therapy planning.

Overall, the results indicate that these tests can help clinicians to identify and diagnose SLI in Greek Cypriot children. Going a step further, the findings can be used as the foundation for the construction of a comprehensive diagnostic test battery. We propose that the available tests be used once they are modified to meet the needs of CG and subsequently standardized.

Several advantages arise from using standardized language tests. First, when standardized tests are used, it is feasible to know how well the provision system acts in terms of the attested impairment. The information gained allows clinicians and researchers as well as policy-makers to deliver conclusions about how many individuals present with SLI, which in turn allows making more appropriate decisions about service provision. Second, an issue that often arises has to do with the definition of SLI. Although clinicians and investigators use the term SLI to refer to a clearly defined group of children, no generally accepted definition exists. Thus, children treated by one clinician may not be similar to those seen by a second clinician. Using standardized tests, the consistency and replicability of the diagnosis is ensured.

## 5. Conclusion

The overall objective of the current study was to examine the available Greek language tests used so far both in clinical and research contexts. The results indicate that standardized assessment tools can support the diagnostic procedure given the fact that a number of tests showed significant differences between children with SLI and control participants. Therefore, the use of the available tests, once modified to meet the needs of the Cypriot Greek linguistic variety, and standardization can become part of a formal language assessment battery for bilingual Greek Cypriot children with SLI living in Cyprus.

## References

- American Psychiatric Association. 2000. *Diagnostic and Statistical Manual of Mental Disorders, 4<sup>th</sup> Edition: DSM-IV*. Washington: American Psychiatric Pub.
- Aram, Dorothy M., and James E. Nation. 1980. Preschool language disorders and subsequent language and academic difficulties. *Journal of Communication Disorders* 13(2):159-70.

- Battle, Dolores. 1996. Language learning and use by African American children. *Topics in Language Disorders* 16(4):22-37.
- Betz, Stacy and Shanleigh Sullivan. 2010. Factors impacting the selection of standardized tests for the diagnosis of SLI. *Poster presentation in Symposium of Research on Child Language Disorders*. Madison, WI.
- Clegg, Judy, Chris Hollis, Lynn Mawhood and Michael Rutter. 2005. Developmental language disorders – a follow-up in later adult life. Cognitive, language and psychosocial outcomes. *Journal of Child Psychology and Psychiatry* 46(2):128-49.
- Craig, Holly K. and Julie A. Washington. 2004. Grade-Related Changes in the Production of African American English. *Journal of Speech Language Hearing Research* 47(2):450-63.
- Dunn, Lloyd M. and Leota M. Dunn. 1981. *Peabody Picture Vocabulary Test*. Circle Pines, MN: American Guidance Service.
- Evans, Julia L., Jenny R. Saffran and Kathryn Robe-Torres. 2009. Statistical learning in children with specific language impairment. *Journal of Speech Language Hearing Research* 52(2): 321-35.
- Giannetopoulou, Aggeliki and Liountmila Kirpotin. 2007. *Metaphon Test*. Athens: Iatrikes Ekdotis Konstantaras.
- Leonard, Laurence. 1998. *Children with Specific Language Impairment*. Cambridge, MA: MIT Press.
- Levanti, Irini, Liountmila Kirpotin, Evdokia Kardamitsi and Maritsa Kambouroglou. 1998. *The Phonological Development of Greek Children*. Athens: Panhellenic Association of Logopedists.
- McGregor, Karla K., Danielle Williams, Sarah Hearst and Amy C. Johnson. 1997. The use of contrastive analysis in distinguishing difference from disorder: A tutorial. *American Journal of Speech Language Pathology* 6(3):45-56.
- Nippold, Marilyn A. and Sandy H. Fey. 1983. Metaphoric understanding in preadolescents having a history of language acquisition difficulties. *Language Speech Hearing Service School* 14(3):171-80.
- Oetting, Janna B. and Janet L. McDonald. 2002. Methods for characterizing participants' nonmainstream dialect use in child language research. *Journal of Speech Language Hearing Research* 45(3):505-18.
- Paraskevopoulos, Ioannis, Anastasia Kalatzi-Azizi and Nikolaos Giannitsas. 1999. *Athina Test: Diagnosis Diskolion Mathisis*. Athens: Ellinika Grammata.
- Paul, Rhea and Lawrence Shriberg. 1982. Associations between phonology and syntax in speech-delayed children. *Journal of Speech Hearing Research* 25:536-47.
- Paul, Rhea, Donald J. Cohen and Barbara K. Caparulo. 1983. A longitudinal study of patients with severe developmental disorders of language learning. *Journal of the American Academy of Child Psychiatry* 22(6):525-34.
- Preston, Jonathan and Mary Louise Edwards. 2010. Phonological awareness and types of sound errors in preschoolers with speech sound disorders. *Journal Speech Language Hearing Research* 53(1):44-60.
- Raven, John C, John Raven and John Court. 1998. *Raven's Progressive Matrices*. San Antonio, TX: Harcourt Assessment.
- Renfrew, Catherine. 1995. *Word Finding Test*. Bicester: Winslow.
- Renfrew, Catherine. 1997. *The Bus Story Test: A Test of Continuous Speech*. Oxford: Speechmark Publishing.

- Rescorla, Leslie. 1989. The language development survey: A screening tool for delayed language in toddlers. *Journal of Speech and Hearing Disorders* 54:587-99.
- Rowe, Charley and Kleanthes K. Grohmann. 2012. Discrete bilingualism: Towards co-overt prestige and diglossic shift in Cyprus. Ms., University of Cyprus.
- Ruscello, Dennis M., Kenneth St Louis and Nancy Mason. 1991. School-aged children with phonological disorders: coexistence with other speech/language disorders. *Journal of Speech and Hearing Research* 34(2): 236-242.
- Seymour, Harry N., Linda Bland-Stewart and Lisa J. Green. 1998. Difference versus deficit in child African American English. *Language Speech Hearing Service School* 29(2):96-108.
- Snowling, Margaret, John W. Adams, Dorothy V. M. Bishop and Susan E. Stothard. 2001. Educational attainments of school leavers with a preschool history of speech-language impairments. *International Journal of Language & Communication Disorders* 36(2):173-83.
- Stavrakaki, Stavroula and Ianthi-Maria Tsimpli. 2000. Diagnostic Verbal IQ Test for Greek preschool and school age children: Standardization, statistical analysis, psychometric properties. *Proceedings of the 8th Conference on Speech Therapy*. 95–106.
- Tallal, Paula, Randal Ross and Susan Curtiss. 1989. Familial aggregation in specific language impairment. *Journal of Speech Hearing Disorders* 54(2):167-73.
- Theodorou, Eleni, Maria Kambanaros and Kleanthes Grohmann. In progress. An investigation of how SLTs evaluate and diagnose children with SLI in Cyprus.
- Thordardottir, Elin, Eva Kehayia, Barbara Mazer, Nicole Lessard, Annette Majnemer, Ann Sutton, Natacha Trudeau and Gevorg Chilingaryan. 2011. Sensitivity and specificity of French language and processing measures for the identification of primary language impairment at age 5. *Journal of Speech Language Hearing Research* 54(2):580-97.
- Tomblin, J. Bruce, Nancy L. Records, Paula Buckwalter, Xuyang Zhang, Elaine Smith and Marlea O'Brien. 1997. Prevalence of specific language impairment in kindergarten children. *Journal of Speech Language Hearing Research* 40(6):1245-60.
- Ullman, Michael and Myrna Gopnik. 1994. Past tense production: Regular irregular and nonsense verbs. *McGill Working Papers in Linguistics* 10:81-118.
- Vogindroukas, Ioannis, Athanasios Protopapas and Georgios Sideridis. 2009a. *Dokimasia Ekfrastikou Leksilogiou*. Athens: Patakis.
- Vogindroukas, Ioannis, Emi Grigoriadou and Maritsa Kambouroglou. 2009b. *Dokimasia glossikis antilipsis kai ekfrasis*. Athens: Glafki.
- Vogindroukas, Ioannis, Stavroula Stavrakaki and Athanasios Protopapas. 2011. *Ikones Drasis*. Athens: Glafki.
- Wyatt, Toya. 2002. Assessing the communicative abilities of clients from diverse cultural and language backgrounds. In D.E. Battle (ed.) *Communication Disorders in Multicultural Populations*, pp. 415-50. Boston: Butterworth-Heinemann.