

Expressive verb morphology deficits in Arabic-speaking children with Developmental Language Disorder

Article

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1 **Expressive Verb morphology deficits in Arabic-speaking children with Developmental**
2 **Language Disorder**

3

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6

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24

25 **Abstract**

26 ***Purpose***

27 This study investigated the production of tense and subject-verb agreement in Palestinian
28 Arabic-speaking children with Developmental Language Disorder (DLD) in comparison to
29 their typically developing peers (TD) in terms of (1) performance accuracy and (2) error
30 patterns.

31 ***Method***

32 Participants were 14 children with DLD aged 4;0 - 7;10 (years; months) and 32 TD children
33 aged 3;0-8;0 (years; months) matched on non-verbal abilities. Children were asked to complete
34 a picture-based verb elicitation task. The task was designed to measure the production accuracy
35 of tense and subject-verb agreement inflections in Arabic.

36 ***Results***

37 The DLD group scored significantly lower than the TD group on the verb elicitation task. The
38 DLD group was significantly less accurate than the TD group in marking tense, specifically
39 present tense. They were also less accurate in marking agreement in general, with specific
40 difficulty in using feminine verb forms. The DLD and TD groups differed in their tense error
41 patterns, but not in agreement error patterns.

42 ***Conclusion***

43 The acquisition of verb morphology in Palestinian Arabic-speaking children with DLD appears
44 to be delayed and possibly different from their TD peers. The DLD group found the production
45 of marked verb forms more challenging than less marked ones. These results are discussed in
46 light of the structural characteristics of Arabic. Future studies would need to include larger
47 sample sizes, investigate other aspects of verb morphology, including both production and
48 comprehension, include other language domains, and consider longitudinal designs to provide
49 more in-depth knowledge of Arabic language acquisition.

50 **Introduction**

51 Children with *Developmental Language Disorder* (DLD) exhibit morpho-syntactic deficits
52 often related to the use of tense and subject-verb agreement inflections (for a review, see
53 Leonard, 2014). Production of verb inflections, such as past tense *-ed*, present third-person
54 singular *-s*, auxiliary and copula *be* and auxiliary *do* forms have been reported as problematic
55 for English-speaking- children with DLD (e.g., Leonard & Kueser, 2019; Rice & Wexler,
56 1996) and verb morphology difficulties are considered to be a clinical marker of DLD in
57 English (e.g., Bedore & Leonard, 1998; Conti-Ramsden, Botting, & Faragher, 2001).

58 Cross-linguistic research shows that verb morphology is differentially impaired across
59 languages. For example, children with DLD acquiring Germanic languages are reported to be
60 less accurate than their typically developing (TD) peers in marking tense and agreement, and
61 especially past tense marking (Krok & Leonard, 2015), yet their accuracy of using verb
62 inflections is higher than that reported for English-speaking children with DLD (for a review,
63 see Leonard, 2014). For children with DLD acquiring Romance languages, such as Spanish
64 and Italian, verb morphology is not as problematic; the main difficulties seem to be using
65 function words, such as articles, and unstressed direct object pronouns (e.g., Bedore &
66 Leonard, 2001; Bortolini, Caselli, & Leonard, 1997). Hebrew-speaking children with DLD
67 have difficulties marking agreement in past tense, but not marking present tense (e.g., Dromi,
68 Leonard, Adam, & Zadunaisky-Ehrlich, 1999; Leonard & Dromi, 1994).

69 In summary, verb morphology deficits vary between languages, especially when languages
70 are typologically different. Therefore, studies of grammatical morphology should be language-
71 specific. The present study aims to extend this line of research by characterizing verb
72 morphology deficits in children with DLD acquiring Palestinian Arabic (PA).

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74 *Palestinian Arabic Verb Paradigm*

75 In the Arab world, Modern Standard Arabic (MSA) is the language of literacy tasks and is
76 used in formal contexts, such as news. A unique feature of the Arabic language is diglossia
77 (Haeri, 2000). Each Arab country has a distinctive dialect of Arabic that is used for everyday
78 social interactions. This paper focuses on the colloquial dialect of Palestine: Palestinian Arabic
79 (PA). MSA and its dialectal varieties are characterized by their nonconcatenating templatic
80 morphology that is based on a system of *roots* and *patterns* (McCarthy & Prince, 1988; Ryding,
81 2005). The *root* is an invariable sequence of three to five consonants and it carries lexical
82 meaning. The *pattern* consists of one or more vowels and it carries grammatical meaning.
83 Patterns (vocalic infixes) are discontinuously inserted within the consonantal root to form
84 words and stems (Tucker, 2011). In PA, for example, the root *drs* denotes a meaning of
85 “studying”. By shifting different patterns and consonantal affixes around this root we can
86 derive different words such as *daras* “he studied”, *madrasa* “school” or *dars* “lesson”. MSA is
87 null-subject language and verbs are conjugated to represent different grammatical categories
88 including tense and aspect (past/present and perfective/imperfective), number (singular, dual
89 and plural), person (first, second and third), gender (masculine and feminine), mood
90 (indicative, subjunctive, jussive, energetic and imperative) and voice (passive/active;
91 Benmamoun, 2000).

92 Three verb forms are distinguished by traditional Arabic grammarians: perfective,
93 imperfective and the imperative verbs. There is debate of whether Arabic verbs are considered
94 to be tense-specific where perfective and imperfective verbs refer to past and non-past actions,
95 respectively; or aspect-specific where perfective and imperfective verbs refer to complete or
96 non-complete actions (for a review, see Ouali, 2018). According to Ouali (2018), there seems
97 to be a consensus in recent literature that Arabic is tense language. Table 1 presents the verb
98 paradigm in PA.

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Table 1. *Verb paradigm in Palestinian Arabic for the root d-r-s (studying)*

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Person	Number	Gender	Past tense			Present tense			Imperative		
			Form	Affixes	Verb + Affixes	Form	Affixes	Verb + Affixes	Form	Affixes	Verb + Affixes
1	Singular	neutral*	1	-it	<i>darasit</i>	9	<i>b-a-</i>	<i>badrus</i>			
1	Plural	neutral	2	-na	<i>darasna</i>	10	<i>b-ni-</i>	<i>bnidrus</i>			
2	Singular	Masculine	3	-it	<i>darasit</i>	11	<i>b-ti-</i>	<i>btidrus</i>	17	<i>ʔi-</i>	<i>ʔidrus</i>
2	Singular	Feminine	4	-ti	<i>darasti</i>	12	<i>b-ti--i</i>	<i>btidrusi</i>	18	<i>ʔi--i</i>	<i>ʔidrusi</i>
2	Plural	neutral	5	-tu	<i>darastu</i>	13	<i>b-ti--u</i>	<i>btidrusu</i>	19	<i>ʔi--u</i>	<i>ʔidrusu</i>
3	Singular	Masculine	6	∅	<i>daras</i>	14	<i>b-yi-</i>	<i>byidrus</i>			
3	Singular	Feminine	7	-at	<i>darsat</i>	15	<i>b-ti-</i>	<i>btidrus</i>			
3	Plural	neutral	8	-u	<i>darasu</i>	16	<i>b-yi--u</i>	<i>byidrusu</i>			

Note. *The gender category “neutral” indicates that the affix attached to the verb has no gender distinction.

114 **Past Tense**

115 In PA, the perfective verb is used to refer to past and completed actions (Abu-Ghazaleh,
116 1983, p.125), will be referred to as past tense. Past tense is an abstract morpheme, i.e. not
117 realized by an overt affix (Benmamoun, 2000). The past tense verb consists of a stem *daras*
118 (root + vocalic infixes) and takes only suffixes which denote subject-verb agreement
119 (Benmamoun, 2000). The suffix is a discontinuous unit which simultaneously reflects
120 agreement for person, gender and number. For example, the suffix *-ti* in *darasti* “you studied”
121 denotes agreement for a 2nd person feminine singular subject (form 4, Table 1). The 3rd person
122 masculine singular *daras* “he studied” is unmarked, i.e. it does not take any suffixes (form 6,
123 Table 1). It is homonymous with the past tense verb stem. It is important to note here that unlike
124 MSA, PA verb paradigm is smaller as the subject-verb number agreement has no dual category
125 and the plural agreement suffix *-u* has no gender distinction (e.g., forms 8, 16 and 19 in Table
126 1; Jarrar et al., 2014).

127 **Present tense**

128 The imperfective verb is used to refer to an ongoing activity which could be in the present, past
129 or the future time (Benmamoun, 2000). In PA, the imperfective verb has three moods:
130 indicative, subjunctive and imperative (Abu-Ghazaleh, 1983; Shahin, 2007). In this section,
131 we focus on its indicative mood which occurs in sentences with present tense interpretation
132 (henceforth, present tense).

133 The present tense is composed of a stem *drus* (root + vocalic affix) with its subject-verb
134 agreement being realized by a prefix or a combination of a prefix and a suffix (circumfix
135 morpheme). In the PA present tense verb, the temporal information is carried by the present
136 progressive clitic *b-*, which attaches to the prefix (Abu-Ghazaleh, 1983; Jarrar et al., 2014;
137 Shahin, 2007). Person agreement is mainly realized by the prefix. Gender is also realized by
138 the prefix, except for the 2nd person singular feminine where gender is expressed by the suffix

139 -i (form 12, Table 1). Plural number agreement is realized by the suffix -u except for the 1st
140 person where the number is realized by the prefix *bni-* (Benmamoun, 2000). More than one
141 subject-verb agreement feature can be realized by one prefix. For instance, the prefix *byi-* in
142 *byid.rus* “he is studying” indicates a 3rd person masculine subject (person and gender
143 agreement). In other instances, the subject-verb agreement features are realized by a circumfix
144 affix, an unanalyzable unit of a prefix and a suffix. An example is the circumfix *byi—u* in
145 *byid.ru.su* “they are studying”, where it denotes 3rd person plural agreement (no gender
146 distinction).

147 Finally, it is clear that the verb forms we described differ from each other in terms of
148 markedness, i.e. the morphological realization of grammatical categories (e.g., Corbett, 1991,
149 2000; Leech, 2006). In Arabic subject-verb agreement, contrasts in number agreement
150 (singular versus plural) and gender agreement (masculine versus feminine) are asymmetrical
151 in terms of their morphological realization. Rather, one member of the contrast is overtly coded
152 by an affix and therefore is “marked”, whereas the other member has no overt coding (zero
153 affixes) and is therefore considered as an unmarked form. For example, if we look at the
154 opposition of singular-plural in number agreement, the singular verb is not overtly realized by
155 any affixes (e.g., *daras* “he studied”), whereas, the plural verb is realized by the affix -u (e.g.,
156 *darasu* “they studied”). The singular verb is therefore considered as the unmarked/default
157 form, while the plural is the marked form. The same applies to gender agreement (only in past
158 tense) where the feminine verb is marked whereas the masculine form is unmarked.

159 **The Imperative**

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161 Although the imperative verb has a shared structure with the present tense, the imperative
162 lacks the present progressive clitic *b-* and the initial prefix which indicates person and gender
163 agreement. The imperative only occurs in the second person, yet the person feature is
164 unmarked (Al-Aqarbeh, 2011). Although PA has a prefix for second person present tense verbs

165 (e.g., *bti-* or *bit-*), this prefix is dropped in the imperative verb. Gender and number agreement
166 of the imperative verb is denoted by the suffix (see forms 17 -19, Table 1).

167 There is little agreement on whether the default tense form in Arabic. While some
168 researchers argued that the default form is the imperative (Abdallah & Crago, 2008; Morsi,
169 2009; Omar, 1973; Qasem & Sircar, 2017), others identify it as the imperfective verb stem
170 (Aljenaie, 2010; Benmamoun, 1999). Fahim (2017) stated that the default verb can take more
171 than one form including the imperative, subjunctive or a variant of the imperfective verb stem.
172 The imperative does not have a time reference and it is considered non-finite (Ryding, 2005).
173 Similarly, Benmamoun (2000) states that the imperfective verb occurs in different contexts
174 such as sentences with past, present or future interpretation as well as in embedded non-finite
175 sentences. This evidence clearly shows that the imperfective does not morphologically carry
176 any temporal or aspectual information (Benmamoun, 1999, 2000). Although there are slight
177 morphological differences between the two forms (primarily in their prefixes), they are very
178 similar which could be the cause of inconsistency among studies. By removing the affixes of
179 the imperative (e.g., form 17, Table 1) and imperfective indicative (present tense; e.g., form
180 11, Table 1), it can be seen that both forms share the same stem, suggesting that the imperative
181 is derived from the imperfective verb (Benmamoun, 1999; Shahin, 2010; Soltan, 2007).

182

183 ***Typical and atypical verb morphology acquisition in Arabic***

184 Few studies have examined typical language acquisition in Arabic. In a longitudinal study,
185 Omar (1973) described the acquisition of phonology, syntax, and morphology in 37 Egyptian
186 Arabic-speaking children aged 6 months to 15 years. The study reported that children started
187 using verbal agreement morphology around the age of 2;3 years. Masculine and singular verbs
188 emerged earlier than feminine and plural verbs, respectively. Omar (1973) further observed

189 that, in the early stages of verb production, Egyptian Arabic-speaking children predominantly
190 used the singular masculine verb as the default verb agreement category.

191 In a longitudinal study on PA, Abdu and Abdu (1986) documented the milestones of lexical
192 development of their two children from around the age of one year up until six years. Their
193 data on the acquisition of verbs indicated a certain order in which verb forms emerge in PA. In
194 line with Omar (1973)'s findings on verb agreement, masculine and singular verbs were
195 developed earlier than feminine and plural verbs, respectively. Additionally, 3rd person verbs
196 appeared before 1st person verbs, with 2nd person verbs appearing last. This order was limited
197 to past tense verbs, as no particular order was noted for present tense verbs.

198 Similar findings are reported by Aljenaie (2001) who followed the development of verb
199 tense and agreement in four Kuwaiti Arabic-speaking children aged 1;17 to 2;6 years for 6
200 months using spontaneous speech, elicited production and imitation tasks. All four children
201 began using present and past tense verbs at age 2;0 years. However, the order at which these
202 forms emerged in the children's language could not be determined due to the variability in the
203 data. Agreement marking emerged in a developmental pattern: masculine verbs appeared
204 before feminine verbs, singular verbs appeared before plural verbs while 1st person verbs
205 appeared first followed by 3rd person and 2nd person verbs, respectively. Furthermore, Aljenaie
206 (2001) noted that children showed a tendency to use unmarked forms in contexts where verb
207 inflections were required. In past tense contexts, the unmarked form was the 3rd person
208 masculine singular, wherein the present tense context the unmarked form was described as
209 being as either the imperative masculine verb or a form that was homophonous to the stem of
210 the target verb (Aljenaie, 2001). The use of the imperative was also noted in the speech of
211 typically developing Yemini (Qasem & Sircar, 2017) and Egyptian-Arabic-speaking children
212 (Omar, 1973).

213 In another longitudinal study, Aljenaie (2010) examined spontaneous speech samples of
214 three Kuwaiti Arabic-speaking children aged 1;8 to 3;1 years. An analysis of agreement errors
215 revealed that masculine verbs were used to substitute feminine verbs. These findings suggest
216 that children show a preference for the less marked, more neutral masculine form, over the
217 feminine counterpart, which is strongly and consistently marked by inflections for gender
218 (Aljenaie, 2010, p.852). Regarding tense errors, Kuwaiti Arabic-speaking children used the
219 imperfective bare verb, a non-finite form, in place of fully inflected verbs (Aljenaie, 2001,
220 2010). This supports the view that the imperfective verb stem is most likely the default tense
221 form in Arabic (Benmamoun, 1999, 2000).

222 Basaffar and Safi (2012) investigated the developmental patterns of tense and verb
223 agreement in two to four-year-old Hijazi Arabic-speaking children. Using experimental tasks
224 alongside a spontaneous speech analysis, they replicated the findings of verb agreement
225 reported by Aljenaie (2001). Basaffar and Safi (2012) concluded that children produced present
226 and imperative forms with higher accuracy than past and future forms. However, the lack of
227 any reported accuracy levels, statistical analysis, error analysis or clear guidelines for the
228 protocol and scoring of the children's responses limits the generalizability of these results.

229 Research into morpho-syntactic difficulties in Arabic-speaking children with DLD has been
230 scarce. Drawing on her dissertation data from 2002 (Abdallah, 2002), Abdallah and Crago
231 (2008) analyzed speech samples obtained from Hijazi-Arabic speaking children with DLD 4;0
232 to 5;3 years of age. Children with DLD were less accurate than their age and language-matched
233 peers in marking tense in general. The DLD group scored significantly higher for past tense
234 than for present tense forms, which suggests that these children's difficulties with tense were
235 more pronounced in present tense verbs. Not all subject-verb agreement categories were
236 problematic for the DLD group. Present tense, feminine and 3rd person verbs, which were
237 structurally more complex were more problematic than unmarked verb forms, such as past

238 tense and masculine verb forms (Abdallah & Crago, 2008). Importantly, both TD and DLD
239 children used the imperative in place of the target tensed forms. In a few instances, children
240 used an incorrect tense form (e.g., present tense for past tense). When agreement errors
241 occurred, one agreement feature was affected (e.g., third person masculine singular replaced
242 third person feminine singular). Abdallah and Crago (2008) characterized agreement errors as
243 follows: singular verbs were used in place of plural verbs, masculine verbs for feminine verbs
244 and first person verbs for third person verbs.

245 Morsi (2009) found that Egyptian Arabic-speaking, 6-year old children with DLD were less
246 accurate than their age and language-matched peers in the production of verbal tense and
247 agreement, with tense being more challenging than agreement. Morsi (2009) stated that, for the
248 DLD group, present tense production was more difficult than past tense production, and the
249 imperative was used as the default form when tense errors occurred.

250 Drawing on her dissertation data from 2005 (Fahim, 2005), Fahim (2017) analyzed
251 spontaneous speech samples of three Egyptian Arabic-speaking children with DLD 3;1 to 4;6
252 years of age and six TD children aged 1;0 to 4;0 years. She concluded that only subject-verb
253 agreement marking was impaired in Egyptian-speaking children with DLD while tense
254 marking was less affected (based on past tense marking). Furthermore, Fahim (2017) identified
255 three errors patterns that were noted in the speech of children with and without DLD. The first
256 error pattern involved the use of a default verb form in place of the tensed verb. The form was
257 described to resemble the imperative or the subjunctive. The second error pattern involved a
258 verb with the correct tense but incorrect agreement. The third error involved the production of
259 non-adult target forms (pseudowords) in place of the target verbs.

260 A different pattern of results emerged in Shaalan's (2010) dissertation which reported that
261 Qatari Arabic-speaking children with DLD (aged 4;6 to 9;4 years) were less accurate in
262 producing tense and agreement inflections than TD children. Specifically, past tense was more

263 problematic than present tense for the DLD group. Shaalan (2010) stressed that these results
264 were preliminary, as they were only based on a few items ($N = 12$) and noted that further
265 research was required.

266 The results of the Arabic studies have generally determined tense and verb agreement
267 aspects that are challenging for children with DLD. There is little agreement among the studies
268 on which aspect of verb morphology is more problematic for children with DLD: tense or
269 agreement. Also, it is inconclusive what the default form in Arabic is as both the imperative
270 and the imperfective bare verb forms have been suggested. These questions require further
271 investigation. Besides, two other methodological issues may have contributed to different
272 findings. First, low participants numbers ($N = 3$) in Fahim's (2017) and Morsi's (2009) studies,
273 which does not allow for generalization of their results. Second, methodological differences in
274 terms of task used: Abdallah and Crago's (2008) and Fahim's (2017) studies analyzed speech
275 samples, whereas Morsi (2009) and Shaalan (2010) used a structured elicitation task for the
276 target verb inflections. This could have resulted in differences in the number and type of verb
277 inflections included in the analyses.

278 *Aims and Approach*

279 This study aims to extend previous Arabic studies by conducting a systematic investigation
280 of verb morphology use by children with and without DLD acquiring Palestinian Arabic (PA).
281 Determining which verb forms are potential linguistic markers of DLD in PA would inform
282 and enhance the current assessment practices of DLD in Palestine. Furthermore, data from
283 Arabic children with DLD could be used to examine the assumptions of theoretical accounts
284 of DLD and provide insights into possible underlying mechanisms of the disorder.

285 The present study examined the production of tense and subject-verb agreement in PA-
286 speaking children with DLD as compared with typically developing (TD) children by

287 investigating: 1) the production accuracy and 2) error patterns of verb tense and agreement
288 marking.

289 We predict that, compared to TD children, children with DLD will achieve lower overall
290 accuracy on the verb elicitation task. Children with DLD will have more difficulties using
291 marked verb forms compared to less marked ones. Specifically, the use of present tense verbs
292 is expected to be more challenging than past tense verbs (Abdallah & Crago, 2008; Fahim,
293 2005; Morsi, 2009). Feminine and plural verbs are predicted to be more problematic than
294 masculine and singular verbs forms (Abdallah & Crago, 2008). Children with and without
295 DLD will use the imperative verb (Abdallah & Crago, 2008; Fahim, 2017; Morsi, 2009) or the
296 imperfective bare verb as tense default forms (Aljenaie, 2010; Benmamoun, 1999). Finally,
297 children with and without DLD will use less marked verbs (masculine and singular verbs) as
298 default agreement forms in place of more marked, feminine and plural verbs (Abdallah &
299 Crago, 2008; Aljenaie, 2010).

300 **Methods**

301 *Participants*

302 The study was approved by the Research Ethics Committee at [REMOVED FOR
303 REVIEW]. Sixty-four Palestinian Arabic-speaking children were recruited: 14 children with
304 DLD (10 boys), aged between 48 and 94 months with a mean age of 66 months ($SD = 15.47$)
305 and 32 TD children (19 boys), aged between 36 and 96 months with a mean age of 62 months
306 ($SD = 16.88$). The groups did not differ significantly on chronological age ($t(44) = .83, p = .413,$
307 $d = .27$). The TD and DLD groups were matched on non-verbal cognitive abilities as measured
308 by raw score on the Coloured Progressive Matrices (CPM; Ravens, 2007), as this test is not
309 standardized on PA-speaking children ($t(42) = -.81, p = .423, d = .26, variance\ ratio = 1.11$).
310 Table 2 summarizes the raw scores of the two groups on several background measures. See
311 Appendix 1 for individual scores.

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313
314

Table 2. A summary of the demographic characteristics, developmental milestones and background measures for the TD and DLD groups

	Group	
	TD N=32	DLD N=14
Demographic characteristics	% (N)	
<i>Mother's education</i>		
Primary school	9.38 (3)	14.29 (2)
High school	31.25 (10)	28.57 (4)
University /college degree	46.87 (15)	35.74 (5)
Postgraduate degree	12.5 (4)	21.43 (3)
<i>Working mother</i>	39.47 (15)	50 (7)
<i>Family history of communication disorders</i>	6.25 (2)	42.56 (6)*
<hr/>		
Developmental milestones	Mean(SD)	
<i>Age in months</i>	Range	
<i>First word</i>	12.69 (2.46) 9 - 18	24.64 (6.65)* 15 - 36
<i>Follow simple commands</i>	17.59(3.44) 12 - 24	20.14 (5.95) 12 - 36
<i>walking</i>	12.66(1.45) 10 - 15	12.5(1.7) 10 -16
<hr/>		
Background measures	Mean(SD)	
<i>raw scores</i>	Range	
<i>MPU</i>	4.91 (1.24) 2.41 - 7.61	3.58 (1.04)*** 2.19 - 6.27
<i>CL-NWR</i> (out of 30)	26.84 (4.34) 16 - 30	15.57 (4.13)** 9 - 23
<i>CPM</i> (out of 36)	16.67 (4.39) 8 - 23	15.5 (4.62) 9 - 23

Note. TD = Typically Developing. DLD = Developmental Language Disorder. SD = standard deviation. MPU = Mean Morpheme per Utterance. CL-NWR = Cross linguistic Non-word Repetition. CPM = Colored Progressive Matrices.
* = $p < .05$, ** = $p < .01$, *** = $p < .001$

315 Children with DLD were recruited through four private speech therapy clinics located in
316 [REMOVED FOR REVIEW]. They were previously independently diagnosed with DLD by
317 qualified speech and language therapists (SLTs) who used non-standardized assessment tasks.
318 Based on a screening of clinical reports, all children in this group had primary language deficits,
319 no obvious non-verbal difficulties, used speech as their primary means of communication and
320 had no diagnoses of any speech disorder interfering with intelligibility. All children were
321 receiving language intervention services at the time of the study. The TD control children were
322 recruited through one day-care, two kindergartens and one school in [REMOVED FOR
323 REVIEW] and had no reported history of language delay/impairment and demonstrated age-
324 appropriate language skills as determined by parental/teachers' reports.

325 Parents completed a questionnaire that included questions about demographics (e.g.
326 maternal education), child's health and general development, language acquisition milestones
327 and family history of language difficulties. The questionnaire was used to ensure that all
328 children were monolingual Arabic speakers and had no evidence or reported history of hearing
329 loss, cognitive and/or neurological impairments, speech motor disorders and diagnoses of other
330 developmental disorders (e.g., Autism). Based on questionnaire results, alongside teacher
331 reports, four children did not meet the eligibility criteria for the TD group and were not tested
332 for the study.

333 Groups did not differ significantly in maternal education: $\chi^2(3, N = 46) = 1.03, p = .793$.
334 Children with DLD had a significantly higher frequency of family history of communication
335 disorders: $\chi^2(1, N = 46) = 6.72, p < .001$) and produced their first words significantly later:
336 $t(14.57) = 6.53, p < .001, d = 2.39$. See Table 2 for details.

337 Because the diagnosis of DLD in [REMOVED FOR REVIEW] is based on informal
338 assessments, scores on standardized language assessments were not available. Two non-

339 standardized tasks were used to verify that children with DLD had language skills that were
340 considerably below the level expected for their chronological age.

- 341 1. Spontaneous narratives of 100 utterances were elicited using a wordless picture book
342 “Frog, where are you” (Mayer, 1969) to calculate the Mean Morpheme per Utterance
343 (MPU). MPU is equivalent to the Mean Length of Utterance (MLU; Brown, 1973) in
344 English. MPU is a measure of grammatical development and takes into account the
345 highly synthetic nature and rich morphology of Semitic languages. (Dromi & Berman,
346 1982). MPU is calculated by dividing the total number of morphemes by the total number
347 of utterances produced in the narrative task. We followed the guidelines of counting
348 Arabic morphemes that were developed by Shaalan and Khater (2006). These guidelines
349 were adapted from the MPU calculation rules in Hebrew (Dromi & Berman, 1982).
350 Previous studies on Arabic (Abdallah & Crago, 2008; Shaalan, 2010) have also used
351 this measure to confirm the presence of developmental language impairment.
- 352 2. The Arabic version of a Crosslinguistic Nonword Repetition test (CL-NWR; for a full
353 description see Abi-Aad & Atallah, 2012). The task includes 30 nonwords and was
354 scored using a whole-item approach (correct/incorrect) with the maximum score being
355 30. The task was found to have potential for the discrimination of L1 learners of
356 Lebanese Arabic with and without DLD (Abi-Aad & Atallah, 2012). The task was also
357 documented to have good diagnostic accuracy in identifying Palestinian children at risk
358 of DLD (Taha & Chondrogianni, 2017).

359 The mean MPU for the DLD group was significantly lower for the TD group: $t(44) = -3.51$,
360 $p < .001$, $d = 1.23$. Scores of the DLD group were also significantly lower than the TD group
361 on the CL-NWR test: $t(44) = -8.22$, $p < .001$, $d = 2.63$. Norms for these tasks are not established
362 for the Palestinian population. Therefore, mean raw scores are reported (see Table 2).

363 ***Verb elicitation task***

364 An elicitation task was developed to test children's production of the following verb forms
365 (1) present masculine singular, (2) present feminine singular, (3) present plural, (4) past
366 masculine singular, (5) past feminine singular, and (6) past plural. The task assessed the
367 production of these morphemes in third person only.

368 Seventy-two pictures were divided into 30 pairs of experimental items and 12 filler items
369 (singular and plural noun pairs). The experimental items were further categorized into 8 paired
370 items for masculine singular verb forms, 7 paired items for feminine singular verb forms and
371 15 paired items for plural verb forms. Because present tense inflections vary in stress
372 assignment, 50% of the present tense verbs had a stressed tense prefix and 50% had an
373 unstressed tense prefix (see Appendix 2 for test items).

374 Each verb was represented by a pair of pictures showing a sequence of events that the child
375 was asked to describe. The first photograph depicted a person or a group performing an activity
376 and the second photograph depicted the same person or group having finished the activity. The
377 test items depicted actions from familiar daily routines. The task was piloted with 10 TD
378 children aged between 40 and 67 months, mean age 58 months ($SD = 9.36$) to ascertain that
379 children of this age could easily identify the verbs in the pictures. Results showed that 96.38%
380 ($SD = 8.21$) of the children were able to correctly name the pictures.

381 ***Procedure***

382 Children were assessed individually in a quiet room within their nursery, school or speech
383 and language therapy clinic. All assessments were conducted in one session by the first author
384 (a qualified Arabic-speaking speech-language therapist). Each session lasted approximately 1
385 hour and was audio-recorded using a Sony ICD-PX370 Digital Voice Recorder. The tasks were
386 administered in the following order: Coloured Progressive Matrices (CPM), narrative task,
387 Crosslinguistic Nonword Repetition Task (CL-NWR), and the verb elicitation task. Four

388 practice items were given to familiarize the children with the verb elicitation task and items
389 were presented in the same order for all participants. Throughout the task, children received
390 praise for their efforts but were not provided with any feedback about the accuracy of their
391 productions. The examiner pointed at each item and presented the child with a question that
392 created an obligatory context for the use of the target verb inflections in present tense, and past
393 tense as seen in the examples below:

394 **1) Present tense**

395 a. **Researcher:** ish byisawwi il-walad halla ?

396 What do-PRES-3MS the-boy now?

397 ‘What is the boy doing now?’

398 b. **Child:** il-walad byiyakul buza

399 The-boy eat-PRES-3MS ice-cream

400 ‘The boy is eating ice-cream’

401 **2) Past tense**

402 a. **Researcher:** il-walad xallas, ish sawa il-walad?

403 The-boy finish-PAST-3MS, what do-PAST-3MS the-boy?

404 What did the boy do yesterday?

405 b. **Child:** il-walad akal buza

406 The-child eat-PAST-3MS ice-cream

407 The child ate ice-cream

408 **Scoring**

409 The children’s responses were transcribed orthographically online and were audio-recorded for
410 further analysis. Children’s productions were scored using three methods:

411 1. **Whole-item accuracy:** The child’s response was scored as correct if it was in the correct
412 tense and had the correct person, number and gender agreement. That is, the child’s

413 response should be identical to the target. If the response differed from the target verb in
414 any of these elements (e.g., correct tense, person and number agreement but incorrect
415 gender agreement), it was scored as incorrect. Correct response received a score of 1 while
416 incorrect verbs received a score of zero. The maximum overall score the child could
417 achieve on the task was 60.

418 **2. Tense accuracy:** Tense accuracy was determined based on the context of the picture
419 (present vs past). The child's response was scored as correct and received a score of 1 if it
420 matched the target tense, regardless of subject-verb agreement accuracy. In case of an
421 incorrect response, the substitute tense was recorded for further error analysis.

422 **3. Subject-verb agreement accuracy:** As described above, subject-verb agreement in
423 Arabic is fusional. Therefore, determining the accuracy of subject-verb agreement is not
424 transparent. Inspection of our data revealed the following: 1) children tended to omit
425 different parts of the same prefix. For instance, 3rd person masculine singular verb *byidrus*
426 "he is studying" would be produced as *yidrus* which is a 3rd person masculine imperfective
427 bare verb or *idrus* a 2nd person masculine imperative verb. 2) Children treated the
428 discontinuous circumfix *byi—u* of the 3rd person plural present tense as separate affixes.
429 Omitting part of the circumfix meant that some but not all of the agreement features of the
430 verb were lost. For example, in the verb *byidrusu* "they are studying", an omission of *-u*
431 will only change number agreement from plural to singular. However, 3rd person agreement
432 will not change since the prefix *byi-* is preserved. To account for this pattern, we followed
433 Abdallah and Crago (2008)'s scoring approach. Each of the agreement features of the
434 child's response (person, number and gender) was checked against the agreement features
435 of the target verb (subject in the picture), irrespective of tense accuracy. Each agreement
436 category was scored as correct or incorrect. Hence, we had three scores: person agreement
437 accuracy, number agreement accuracy and gender agreement accuracy. Errors in each

438 element were recorded for further error analysis. To better illustrate the scoring system,
 439 we provide an example below.

	Verb +	Affixes	Tense	Person	Number	Gender
	Affixes					
Target	<i>btidrur</i>	<i>bti-</i>	Present	3rd	Singular	Feminine
Child's	<i>idrur</i>	<i>i-</i>	Imperative	2nd	Singular	Masculine
production						
Accuracy	Incorrect	Incorrect	Incorrect	incorrect	Correct	Incorrect
Whole-item	Incorrect					
score						

440
 441 **Reliability**

442 The spontaneous speech sample of randomly selected 10 children (21% of the sample) and
 443 their responses on the verb elicitation tasks were scored by an independent speech and language
 444 therapist to calculate inter-rater reliability. The agreement between the two raters was 100%
 445 for the overall score, 98% for tense scores, 100% for gender scores, 100% for number scores,
 446 97% for the person scores. The inter-rater agreement for MPU calculations was 87%.

447 **Analysis**

448 Statistical analysis was carried out using R studio software version 3.6.0 (RStudio, 2019).
 449 Raw scores were converted to percentages. For each of the tense and agreement accuracy
 450 scores, mixed-design ANOVAs were conducted with the target grammatical category as a
 451 within-subject variable and group as the between-subject variable. Significance levels
 452 were set at $p < .05$. Significant interactions were followed by simple effects analysis.
 453 Bonferroni corrections for multiple comparisons were applied (Field, 2009, *p.373*). Type 1
 454 error was controlled for by dividing the significance value ($p < .05$) by the number of

455 comparisons ($n = 4$). Hence, the significance level for all simple effects analysis was $p < .0125$.

456 **Results**

457 *Analysis 1: The production accuracy of verb tense and agreement marking*

458 Overall, the DLD group scored significantly lower than the TD group on the verb elicitation
459 task ($t(16.91) = -3.89, p < .001, d = 1.36$). Table 3 summarizes the accuracy of the verb forms
460 examined in the task.

461 **Tense accuracy**

462 Tense accuracy scores were analyzed using a 2 x 2 mixed-design ANOVA with group as a
463 between-subject factor (2 levels: DLD and TD) and verb tense as a within-subject factor (2
464 levels: past and present). Analysis revealed a significant main effect of group [$F(1, 44) = 22.36,$
465 $p < .001, \eta^2 = .34$], verb tense [$F(1, 44) = 23.85, p < .001, \eta^2 = .35$]. Also, the group by verb
466 tense interaction was significant [$F(1, 44) = 18.04, p < .001, \eta^2 = .29$].

467 The TD group were significantly more accurate marking past tense than present tense: $t(31)$
468 $= 2.79, p < .0125, d = .49$. Similarly, the DLD group was more accurate with past tense marking
469 than present tense marking: $t(13) = 3.97, p < .0125, d = 1.06$. Independent sample t-tests
470 revealed that the TD group was more accurate than the DLD group in using present tense:
471 $t(14.87) = -3.49, p < .0125, d = 1.27$ and past tense: $t(44) = -3.36, p < .0125, d = 1.07$.

472 Furthermore, we examined whether the production accuracy of present tense verbs varied
473 based on whether the prefix was stressed or not. Children with DLD used present tense verbs
474 with a stressed prefix with 73.33% accuracy ($SD = 29.12$). This was slightly higher than their
475 accuracy of producing verbs with unstressed prefixes which was 67.13% ($SD = 22.57$).
476 However, this difference was not statistically significant ($t(13) = -1.41, p = .18, d = .38$).

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480 **Table 3.** Mean Percentages correct (with standard deviations) of the TD and DLD groups for
 481 the target morphemes
 482
 483

	Group	
	TD N=32	DLD N=14
Overall accuracy	94.64 (9.06)	77.14 (15.71)***
Tense accuracy	96.09 (6.51)	81.42 (14.93)**
<i>Present tense</i>	94.06 (9.94)	70.24 (24.72)**
<i>Past tense</i>	98.13 (4.47)	92.38 (6.97)**
Agreement accuracy	97.34 (4.86)	85.12 (12.75)*
Gender agreement	98.96 (2.15)	93.10 (7.33)*
<i>Masculine agreement</i>	100.00 (0)	97.32 (4.72)
<i>Feminine agreement</i>	97.77 (4.6)	88.27 (12.09)**
Number agreement	98.7 (4.55)	95.36 (7.11)**
<i>Singular agreement</i>	100.00 (0)	98.81 (2.48)
<i>Plural agreement</i>	97.40 (6.21)	91.91 (8.54)
Person agreement <i>3rd person</i>	99.06 (2.71)	92.14 (10.55)**

484 **Note.** TD = Typically Developing. DLD = Developmental Language Disorder.
 485 * = $p < .05$, ** = $p < .01$, *** = $p < .001$
 486

487 **Subject-verb agreement accuracy**

488 A composite percentage score of subject-verb agreement was calculated for number, gender,
 489 and person. Subject-verb agreement accuracy scores were analyzed using a 2 x 2 mixed-design
 490 ANOVA with group as a between-subject factor (2 levels: DLD and TD) and verb tense as a
 491 within-subject factor (2 levels: past and present). There was a main effect of group [$F(1, 44) =$

492 22.5, $p < .05$, $\eta^2 = .33$]. The main effect of tense was non-significant, but the interaction
493 between tense and group was significant [$F(1, 44) = 8.39$, $p < .001$, $\eta^2 = .16$]. Based on simple
494 effects analysis, the TD group marked subject-verb agreement at a similar level of accuracy for
495 past tense ($M = 97.4\%$, $SD = 5.53$) and present tense ($M = 97.29\%$, $SD = 6.07$, $t(31) = .09$, $p =$
496 $.923$, $d = .01$). The DLD group presented a different pattern, showing higher accuracy in
497 marking subject-verb agreement in past tense verbs ($M = 97.92\%$, $SD = 6.07$) compared to
498 present tense verbs ($M = 89.52\%$, $SD = 9.41$): $t(13) = 2.36$, $p < .05$, $d = .62$. Furthermore, the
499 TD group was significantly more accurate than the DLD group in marking subject-verb
500 agreement in present tense verbs: $t(14.87) = -3.49$, $p < .0125$, $d = 1.27$, but not in past tense
501 verbs: $t(17.07) = -2.92$, $p = .02$, $d = 1.0$.

502 **Subject-verb agreement: gender agreement accuracy**

503 This analysis was only conducted for singular verbs as gender in verbs that end with the
504 plural morpheme *-u* is used regardless of the gender of the subject in PA. Gender agreement
505 accuracy scores were analyzed using a 2 x 2 x 2 mixed-design ANOVA with group as a
506 between-subject factor (2 levels: DLD and TD), verb tense (2 levels: past and present) and
507 gender category (2 levels: masculine and feminine) as within-subject factors. There were
508 significant main effects of group [$F(1, 44) = 17.36$, $p < .001$, $\eta^2 = .28$] and gender [$F(1, 44) =$
509 18.52 , $p < .001$, $\eta^2 = .3$]. The group by gender interaction was significant [$F(1, 44) = 9.83$, p
510 $< .01$, $\eta^2 = .18$].

511 The TD group showed higher accuracy in marking masculine verbs relative to feminine
512 verbs: $t(31) = -2.74$, $p < .01$, $d = .49$). The same was observed in the DLD group: $t(13) = -3.31$,
513 $p < .0125$, $d = .88$. The TD group and DLD group did not differ significantly in their production
514 accuracy of masculine verbs: $t(13) = -2.12$, $p = .06$, $d = .84$). Yet, the DLD group was
515 significantly less accurate than the TD group in using feminine verbs: $t(14.68) = -2.85$, $p <$

516 .0125, $d = 1.04$). There were no significant interactions between group and tense, gender and
517 tense, and group, gender, and tense.

518 Further analysis was conducted for the DLD group to examine whether the production
519 accuracy of the present tense feminine prefix was affected by stress assignment. The DLD
520 group produced present tense verbs with a stressed prefix ($M = 78.57\%$, $SD = 32.31$) with
521 significantly higher accuracy than the same forms but with unstressed prefix: $M = 61.43\%$, SD
522 $= 29.83$, $t(13) = -2.28$, $p < .05$, $d = .61$.

523 **Subject-verb agreement: number agreement accuracy**

524 The number agreement accuracy scores were analyzed with a 2 x 2 x 2 mixed-design
525 ANOVA with group as a between-subject factor (2 levels: DLD and TD), verb tense (2
526 levels: past and present) and number category (2 levels: singular and plural) as within-
527 subject factors. There were significant main effects of group [$F(1, 44) = 7.36$, $p < .01$, η^2
528 $= .14$] and number [$F(1, 44) = 16.76$, $p < .001$, $\eta^2 = .28$]. The group by number interaction
529 was significant [$F(1, 44) = 4.29$, $p < .05$, $\eta^2 = .11$]. Simple effects analysis revealed that
530 the TD group did not differ in the accuracy of marking singular and plural verbs: $t(31) =$
531 -2.37 , $p < .0125$, $d = .42$. In contrast, the DLD group was significantly less accurate in
532 marking plural verbs compared to singular verbs: $t(13) = -3.64$, $p < .0125$, $d = .97$. The
533 TD and DLD groups were not significantly different in their accuracy of marking singular
534 verbs: $t(13) = -1.79$, $p = .094$, $d = .6$ or plural verb forms: $t(19.26) = -2.44$, $p = .044$, $d =$
535 $.74$. There were no significant interactions between group and tense, number and tense,
536 and group, number, and tense.

537 **Subject-verb agreement: person agreement accuracy**

538 Person agreement score was based on the accuracy of marking verbs in 3rd person and were
539 analyzed with a 2x2 mixed-design ANOVA with group as a between-subject factor (2 levels:
540 DLD and TD), verb tense (2 levels: past and present) as within-subject factor. There was a

541 main significant effect of group [$F(1, 44) = 12.26, p < .001, \eta^2 = 0.22$], with the TD group
542 outperforming the DLD group in person agreement accuracy. There was a main effect of tense
543 [$F(1, 44) = 7.53, p < .05, \eta^2 = 0.15$]. In general, marking 3rd person in past tense verbs ($M =$
544 98.62% , $SD = 3.34\%$) was easier than marking present tense verbs ($M = 95.29, SD =$
545 11.06). The group by tense interaction was not significant [$F(1, 44) = 2.72, p = .08, \eta^2 = 0.02$].

546 *Analysis 2: Error patterns in verb tense and agreement marking*

547 **Tense**

548 We compared DLD and TD children on the type and frequency of the forms they used in
549 place of the target tense. The frequency of tense substitutes in the DLD group was almost as
550 twice as that of the TD group (see Table 4). The tense substitutes were either finite forms or
551 non-finite/tenseless forms. Finite substitutes involved the use of the incorrect tense (e.g., past
552 tense for present tense). The non-finite substitutes involved the use of the imperfective bare
553 verb and the imperative in place of the target tense.

554 The imperfective bare verb was most commonly used as a substitute for present tense by
555 the DLD group, followed by the imperative and incorrect tense (e.g., past for present).
556 Similarly, the most common present tense substitute in the TD group was the use of
557 imperfective followed by the imperative and incorrect tense. The frequency of present tense
558 substitutes significantly differed between groups ($\chi^2(2, N=201) = 7.05, p < .05$).

559 The DLD group used the imperative and the present tense as substitutes for past tense verbs.
560 In rare occasions, they used the imperfective bare verb. On the other hand, the TD group
561 predominantly used the imperfective verb as a default form for past tense, followed by the use
562 of present tense. The TD group rarely used the imperative as a default form in place of past
563 tense. The frequency of past tense substitutes significantly differed between the TD and DLD
564 groups ($\chi^2(2, N = 54) = 10.56, p < .001$).

565

566

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Table 4. *Frequency of tense substitutes*

Target	Substitute type	Group		
		TD	DLD	
		<i>N</i>	<i>N</i>	
Present tense	Non-finite	<i>Imperative</i>	15	51
		<i>Imperfective</i>	42	59
	Finite	<i>Past tense</i>	15	19
	Total		72	129
Past tense	Non-finite	<i>Imperative</i>	3	15
		<i>Imperfective</i>	10	4
	Finite	<i>Present tense</i>	7	15
	Total		20	34

Note. **TD** = Typically Developing. **DLD** = Developmental Language Disorder.

569

570

571 **Subject-verb agreement**

572

573

574

575

For present tense verbs, the frequency of agreement errors in the DLD group was four times that of the TD group (see Table 5). Inspection of the data in Table 5 reveals that some of the agreement errors were associated with tense errors. The majority of the agreement errors were related to the use of the imperative verb and affected person agreement only. The omission of

576 the prefix *byi-* often resulted in the 3rd person present tense verb being substituted by the 2nd
577 person imperative verb (tense and person errors). This type of error barely occurred in the TD
578 group. There were few instances where gender and/or number were also affected. An example
579 of this was the use of the 2nd person masculine imperative instead of 3rd person feminine
580 present tense (tense, person and gender errors).

581 There were also agreement errors that occurred despite using the correct tense. The majority
582 of errors in the TD and DLD groups affected the 3rd person plural present tense. Correct
583 agreement for this form requires the use of the circumfix (e.g. *byi—u* in *byidrusu* “they are
584 studying”). In both groups, it was noted that the plural morpheme *-u* was omitted which resulted
585 in the 3rd person singular verb (number agreement error). The 3rd person feminine singular
586 present tense form had the second-highest rate of errors in both groups. In both groups, this
587 form was substituted by its masculine counterpart (gender agreement error).

588 In general, the frequency of errors that affected past tense production was lower than present
589 tense production. As seen in Table 6, some of the agreement errors in past tense were associated
590 with tense errors. The majority of these errors were associated with the imperative and only
591 affected person agreement. For instance, when the 3rd person plural past tense was replaced
592 with the 2nd person plural imperative (person and tense error). In a few occurrences, gender
593 agreement was also affected. An example of this was the use of the 2nd masculine imperative
594 in place of third person feminine past tense (tense, person and gender errors).

595 When past tense was used correctly, the majority of agreement errors affected 3rd person
596 plural past tense. Both the TD and DLD group showed omissions of the plural suffix *-u* which
597 resulted in the 3rd person singular past tense as a substitute (number error). The 3rd person
598 feminine past tense had the second-highest number of errors in both groups. The omission of
599 the feminine suffix *-at* resulted in the 3rd person masculine as a substitute (gender error).

Table 5. Frequency of Subject-verb agreement errors in present tense verbs

		TD			DLD		
		Target forms			Target forms		
Actual productions		PRES-3MS <i>b-yi-drus</i>	PRES-3FS <i>b-ti-drus</i>	PRES-3P <i>b-yi-drusu</i>	PRES-3MS <i>b-yi-drus</i>	PRES-3FS <i>b-ti-drus</i>	PRES-3P <i>b-yi-drus-u</i>
Non-finite forms	IMPR-2FS <i>ʔidrusi</i>		3			8	2
	IMPR-2MS <i>ʔidrur</i>	4	2	6	15	2	2
	IMPR-2P <i>ʔi-drus-u</i>						23
	IMPF-3MS <i>yi-drus</i>					1	
	IMPF-3FS <i>ti-drus</i>				3		
Incorrect tense	IMPF-3P <i>ti-drusu</i>					1	
	PAST-3MS <i>daras</i>			1		3	1
	PAST-3FS <i>dars-at</i>						1
	PRES-3MS <i>b-yi-drus</i>		1	5		5	13
Correct tense	PRES-3FS <i>b-ti-drus</i>			3			0
	Total	4	6	15	18	20	42

Note. TD = Typically Developing. DLD = Developmental Language Disorder. PRES-3MS = present 3rd person masculine singular. PRES-3FS = present 3rd person feminine singular. PRES-3P = present 3rd person plural. IMPR-2FS = Imperative 2nd person feminine singular. IMPR-2MS = Imperative 2nd person masculine singular. IMPR-2P = Imperative 2nd person plural. IMPF-3MS = imperfective 3rd person masculine singular. IMPF-3FS = imperfective 3rd person feminine singular. IMPF-3P = imperfective 3rd person plural. PAST-3MS = past 3rd person masculine singular. PAST-3FS = past 3rd person feminine singular.

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603

Table 6. Frequency of Subject-verb agreement errors in past tense verbs

		TD			DLD		
		Target forms			Target forms		
		PAST-3MS <i>daras</i>	PAST-3FS <i>dars-at</i>	PAST-3P <i>daras-u</i>	PAST-3MS <i>daras</i>	PAST-3FS <i>dars-at</i>	PAST-3P <i>daras-u</i>
Actual productions							
Non-finite forms	IMPR-2MS <i>ʔi-drus</i>	2	3		3	2	
	IMPR-2FS <i>ʔi-drus-i</i>		1			4	
	IMPR-2P <i>ʔ-idrus-u</i>			1			5
	IMPF-3MS <i>yi-drus</i>					1	
Incorrect tense	PRES-3MS <i>b-yi-drus</i>		1			1	2
Correct tense	PAST-3MS <i>daras</i>		2	12		5	8
	PAST-3FS <i>dars-at</i>			3	1		5
	PAST-3P <i>daras-u</i>				1		
Total		2	7	16	5	13	20

Note. **TD** = Typically Developing. **DLD** = Developmental Language Disorder. **PAST-3MS** = past 3rd person masculine singular. **PAST-3FS** = past 3rd person feminine singular. **PAST-3P** = past 3rd person plural. **IMPR-2MS** = Imperative 2nd person masculine singular. **IMPR-2FS** = Imperative 2nd person feminine singular. **IMPR-2P** = Imperative 2nd person plural. **IMPF-3MS** = imperfective 3rd person masculine singular. **IMPF-3FS** = imperfective 3rd person feminine singular.

604

605 **Discussion**

606 This study examined verb morphology production in Palestinian Arabic-speaking children
607 with Developmental Language Disorder (DLD) and their typically developing peers (TD).
608 Using a novel verb production task, we aimed to compare children with and without DLD in
609 terms of their (1) accuracy rates and (2) error patterns of marking tense and subject-verb
610 agreement.

611 *The production accuracy of verb tense and agreement marking*

612 As predicted, there was a significant difference between children with and without DLD in
613 the percentage of correct use of tense and subject-verb agreement verb inflections, with the
614 DLD group scoring significantly lower than the TD group on the verb elicitation task. This
615 suggests that PA-speaking children with DLD have difficulties in using verbal tense and
616 agreement forms. These findings corroborate the well-documented evidence that verb
617 morphology production is an area of vulnerability for children with DLD acquiring Arabic
618 (Abdallah & Crago, 2008; Morsi, 2009; Fahim, 2017), just as it is for other languages, such as
619 English (e.g., Rice & Wexler, 1996), German (e.g., Rothweiler, Chilla & Clahsen, 2012);
620 Swedish (e.g., Hansson & Leonard, 2003), Hebrew (e.g., Leonard & Dromi, 1994) and Italian
621 (e.g., Bortolini et al., 1997).

622 Overall, the percentage of correct tense marking in the DLD group (82%) was significantly
623 lower than in the TD group. When the accuracy scores of the groups for both tense forms were
624 contrasted, a remarkable pattern emerged. Despite significant group differences, TD children
625 and children with DLD produced past tense verbs with a high level of accuracy, scoring 98%
626 and 92%, respectively. Conversely, the DLD group had significant difficulties with their use
627 of present tense, with a mean accuracy of 70%. The specific difficulty with present tense
628 production was reported previously for Arabic-speaking children with DLD (e.g., Abdallah
629 and Crago, 2008; Morsi, 2009) and it is unlike other languages where a considerable body of

630 research has reported greater difficulties with the past tense, as in English (e.g., Rice & Wexler,
631 1996). A possible factor for differences in which tense forms are affected in different languages
632 is structural complexity. For example, a higher number of errors exhibited by Hebrew-speaking
633 children with DLD in using past tense relative to present tense has been attributed to the higher
634 number of agreement features required for the past inflection (Dromi et al., 1999). Following
635 this view, in PA, the past tense form is less marked, structurally simpler than the present tense
636 (as discussed in the Introduction). For example, the verb *daras* “he studied”, is formed by
637 combining the vocalic pattern *a-a* with the root *d-r-s* (there is no overt marking of tense),
638 whereas the present form *byidrus* “he is studying ” entails the insertion of a vocalic pattern *-u-*
639 plus the addition of a prefix *byi-*, where the prefix *b-* indicates present tense.

640 In terms of subject-verb agreement, children with DLD produced 85% of the verbs with the
641 correct agreement for all categories, and this was significantly lower than the TD group who
642 showed an almost ceiling effect, with their agreement accuracy being 97%. Interestingly, the
643 overall accuracy for marking agreement in the DLD group was higher than for marking tense.
644 This suggests that marking of tense was more problematic than marking subject-verb
645 agreement for our sample. Abdallah and Crago (2008) who also reported that preschool-age,
646 Hijazi Arabic-speaking children had higher accuracy scores in marking subject-verb agreement
647 (77%) compared to tense (68%).

648 Difficulty with subject-verb agreement is not surprising as the subject and verb must agree
649 on several grammatical categories including person, number and gender. Furthermore,
650 agreement in PA is fusional, where more than one agreement category is denoted by a single
651 inflection. For example, the suffix *-at* in *darsat* “she studied” denotes 3rd person, feminine
652 gender and singular number simultaneously. In other instance, agreement categories denoted
653 by a circumfix affix, where a prefix and suffix are required. An example of this is the circumfix
654 *byi—u* in *byidrusu* where it indicates 3rd person plural agreement (no gender distinction).

655 Having to express more than one agreement category simultaneously using less transparent
656 morphemes could be contributing factors in making these forms more challenging (Dromi et
657 al., 1999).

658 Examination of gender agreement marking revealed that the DLD group was similar to the
659 TD group in producing masculine verb forms but were less accurate in producing feminine
660 verb forms. Several factors could explain the greater difficulty with marking feminine
661 agreement observed in the DLD group. This pattern was also found in Hijazi- Arabic speaking
662 children with DLD (Abdallah & Crago, 2008). First, in the typical acquisition of Arabic,
663 masculine verb forms are acquired earlier than feminine verb forms, both in production
664 (Aljenaie, 2000) and comprehension (Al-Akeel, 1998). Furthermore, masculine verb forms are
665 less marked compared to feminine forms (e.g., *daras* “he studied” versus *darsat* “she studied”).

666 Looking at number agreement marking, the DLD group was similar to the TD group in
667 producing singular and plural verbs. However, the DLD group was less accurate in their use of
668 plural verbs compared to singular verbs. This can be attributed to the order in which these
669 forms appear in typical development. Singular verb forms are acquired earlier than plural verb
670 forms, both in production (Abdu & Abdu, 1986; Aljenaie, 2001; Basaffar & Safi, 2012; Omar,
671 1973) and comprehension (Al-Akeel, 1998; Moawad, 2006). Moreover, singular number
672 agreement is unmarked any overt inflections in present and past tense verbs whereas plural
673 number agreement is by the suffix *-u* (e.g., *daras* “he studied” versus *darasu* “ they studied”).

674 In regards to person agreement, though there were significant differences between the TD
675 and DLD groups, both groups marked 3rd person agreement with more than 90% of accuracy.
676 This high level of accuracy can be attributed to the fact that 3rd person verbs are the first to
677 emerge in the language of TD children acquiring Arabic (Abdu & Abdu, 1986; Aljenaie, 2001;
678 Basaffar & Safi, 2012). Our findings are in contrast to the findings of Abdallah and Crago
679 (2008) who reported that Hijazi-Arabic speaking children with DLD had a difficulty with

680 person agreement as they produced 3rd person verbs with 66% of accuracy (compared to 92%
681 in our study). This difference can be attributed to age differences: in our study the mean age of
682 the DLD group was 66 months with the oldest child being 94 months) whereas in Abdallah and
683 Crago (2008)'s study, the mean age of the DLD group was 57 months with the oldest child
684 being 63 months).

685 An interesting observation emerged regarding stressed and unstressed affixes (for a
686 description of stress patterns in PA, see Watson, 2011). Despite the lack of significant statistical
687 differences, the DLD group produced present tense verbs with the stressed prefix more
688 accurately than verbs with the unstressed prefix. Looking specifically at the present tense
689 feminine inflection *biti-* and its allomorph *bit-*, the DLD group used present tense feminine
690 verbs with a stressed prefix with 79% of accuracy compared to 61% of accuracy for verbs with
691 an unstressed prefix. This discrepancy could possibly be attributed to the lower acoustic
692 salience unstressed prefixes.

693 Furthermore, the past tense feminine agreement morpheme *-at* as in '*dar.sat* "she studied"
694 was challenging for the DLD group in our study. This inflection occurs at the end of the word
695 as part of an unstressed syllable, making the suffix *-at* more likely to be missed by children
696 with DLD possibly due to its lower acoustic salience. This suffix was often omitted from the
697 past feminine verb forms resulting in a masculine verb *da.ras* "he studied". The plural
698 inflection *-u* as in '*da.ra.su* "they studied" was not problematic for the DLD group. The plural
699 inflection always occurs in a final unstressed syllable (Watson, 2011), which would have lower
700 acoustic salience relative to the other syllables in the verb. Stressed syllables are typically
701 louder and longer making them have a high perceptual salience. Although the accuracy of using
702 inflections was higher when they were stressed compared to being unstressed, the scores of the
703 DLD group on the stressed inflections were relatively low. This suggests that, even though
704 children with DLD may have difficulties in perceiving morphemes of low acoustic saliency,

705 this is unlikely to be the only factor that underpins their difficulties with verb morphology
706 production and further research is needed to address this issue.

707 *Error patterns in verb morphology production*

708 Qualitative analysis revealed that the target tense forms were substituted by either finite
709 forms (incorrect tense) or non-finite/tenseless forms (imperative and the imperfective bare
710 verb). Interestingly, the TD and DLD groups appear to display the same tense substitution
711 patterns, but they differ in the frequency of their use. As predicted, the most frequent tense
712 substitution patterns in the DLD group were the use of the imperative as well the imperfective
713 bare verb. These two non-finite forms occurred with equal frequency. On the other hand, the
714 use of the imperfective bare was the most common substitute noted in the TD group, whereas
715 the imperative was used less frequently in this group. The use of incorrect tense (e.g., past for
716 present tense) was the least occurring tense error in both groups.

717 A considerable body of research has shown that the verb morphology error patterns displayed
718 by children with DLD are similar to those observed in younger TD children acquiring the same
719 language (Leonard, 2014). In fact, according to the *Extended Optional Infinitive (EOI)*; e.g.,
720 Rice & Wexler, 1996; Rice, Wexler, & Cleave, 1995), children with and without DLD go
721 through an *OI* stage in which they treat marking of tense and agreement as being optional in
722 obligatory contexts (e.g., Rice & Wexler, 1996). For example, English and German-speaking
723 children with DLD tend to use infinitives or bare stem forms instead of the target tense (Rice
724 & Wexler, 1996). Arabic has no infinitive forms. Yet, a stage similar to *OI* seems to exist in
725 this language. Children with and without DLD in our study used the imperative and
726 imperfective bare verb forms instead of target tense. The use of the imperative has been
727 observed in the language of TD toddlers acquiring Yemini Arabic (Qasem & Sircar, 2017),
728 Egyptian Arabic (Fahim, 2017; Omar, 1973) and Kuwaiti Arabic (Aljenaie, 2001) as well as
729 children with DLD acquiring Hijazi Arabic (Abdallah & Crago, 2008) and Egyptian Arabic

730 (Fahim, 2017; Morsi, 2009). The imperfective bare stem has been observed in the language of
731 TD children acquiring Kuwaiti Arabic (Aljenaie, 2010) and children with and without DLD
732 acquiring Egyptian Arabic (Fahim, 2017). In accordance with *EOI*, the use of the imperative
733 and the imperfective bare verb forms as default forms is extended for a longer period in Arabic-
734 speaking children with DLD. Both of these forms are described as being non-finite (Ajlenaie,
735 2010) or tenseless (Benmamoun 1999, 2000). Children with and without DLD in our study also
736 used finite forms instead of the target. Our findings thus emphasize that the typology of a
737 language impacts both on the type of structures affected by DLD and on the type of errors that
738 characterize the disorder. Our findings also expand on Paradis and Crago's (2004) proposal that
739 the term “default form” refers to the optional use of either non-finite or finite forms instead of
740 target tense, which is observed in children with and without DLD.

741 A closer look at the types of errors in subject-verb agreement reveals an interesting pattern.
742 The of the masculine verb instead of the feminine verb was the most dominant gender
743 agreement error in the DLD and TD groups. The error involved the omission of the suffix *-at*
744 of past tense feminine verbs, or the prefix *bti-* /*bit-* of present tense feminine verbs. This type
745 of error has been reported to Arabic-speaking children with typical language development
746 (Aljenaie, 2001, 2010; Omar, 1973) and with DLD (Abdallah, 2002; Abdallah & Crago, 2008;
747 Fahim, 2005).

748 For the TD and DLD groups, the most dominant number agreement error was the omission
749 of the plural suffix *-u* of the past tense, or the suffix *-u* of the circumfix *byi-u* in the present
750 tense verb. This pattern was observed in the TD and DLD groups. This omission error resulted
751 in the unmarked singular verb being a substitute of the marked plural verb. The use of singular
752 verbs in placed of plural verbs has also been documented in Arabic speaking children with and
753 without DLD (Abdallah, 2002; Abdallah & Crago, 2008; Aljenaie, 2001, 2010; Omar, 1973).
754 It can be seen that, in line with our prediction, gender and number agreement errors involved

755 the use of the unmarked form instead of the marked form. In this case, the unmarked masculine
756 and singular verbs were used instead of the marked feminine and plural verbs, respectively.
757 This pattern has been also reported for Kuwaiti Arabic-speaking TD children (Aljenaie, 2001,
758 2010) and Hijazi Arabic-speaking children with DLD (Abdallah & Crago, 2008). These
759 findings are in support of Omar (1973)'s suggestion that the third masculine singular may be
760 the default verbal agreement form in Arabic.

761 We only examined the subject-verb agreement for 3rd person verbs. Person agreement errors
762 were primarily associated with tense errors. This occurred in cases where the imperative was
763 used instead of the target tense. This pattern differs from the findings of Abdallah & Crago
764 (2008) who documented that Hijazi Arabic-speaking children with DLD used 1st person verbs
765 in place of 3rd person verbs. The pattern also differs from studies reporting that the 3rd person
766 verbs emerge earlier than 2nd person verbs (Abdu & Abdu, 1986; Aljenaie, 2001, 2010;
767 Basaffar & Safi, 2012). In the DLD group, the imperative was mostly used instead of present
768 tense verbs ($N = 51$) and much less frequently in place of past tense verbs ($N = 15$). Third
769 person agreement is realized by the prefix of the present tense verb or the suffix of the past
770 tense verb, whereas, the impertive 2nd person agreement is unmarked by any affixes. Therefore,
771 it appears person agreement errors represent the use of the unmarked 2nd person imperative
772 instead of the marked 3rd person present/past tense verb. Based on the current data and the test
773 items, it is difficult to determine whether the difficulty is in marking tense or person agreement.
774 To determine this, an additional examination of 1st and 2nd person verb production is needed.

775 It is important to not that Abdallah and Crago (2008) reported that when Hijazi Arabic-
776 speaking children with and without DLD made tense or agreement errors, the inaccurate
777 production differed from the target verb by one feature only. Inspection of our data reveals a
778 similar pattern. Apart from the use of the imperative (tense and person error), the majority of
779 errant productions of the TD and DLD groups differed from the target by one feature. These

780 errors are referred to as being "near misses" and have been documented in richly inflected
781 languages such as Hebrew and Spanish (for a review, see Leonard, 2014). Another important
782 observation is that most errors in the TD and DLD groups were made in forms in which
783 agreement is realized by a circumfix morpheme. In our study, this form was the 3rd plural
784 present tense verb in which tense, person and number agreement are expressed by the circumfix
785 *byi--u*. The children in our study treated the circumfix affixes as separate units. The most
786 common error was the omission of the prefix *byi-* while retaining the suffix *-u*. A similar
787 pattern was noted in Kuwaiti Arabic in which the 3rd plural present tense verb is expressed with
788 the circumfix *yi--oon*. Aljenaie (2001) found that the TD Kuwaiti Arabic-speaking children
789 tended to omit the prefix *yi-* and maintain the suffix *-oon*. The second error pattern in our study
790 involved omission of the plural suffix *-u* while retaining the prefix, and this pattern was
791 documented in Hijazi Arabic-speaking children with DLD (Abdallah & Crago, 2008) and was
792 also observed in TD Kuwaiti Arabic-speaking children (Aljenaie, 2010).

793 ***Clinical implications***

794 Given the lack of standardized Arabic assessments for PA, the diagnosis of DLD is based
795 on informal evaluation procedures that are combined with subjective clinical judgments, which
796 may lead to variations and inconsistencies across speech and language therapists (SLTs) as to
797 which structures are targeted in the assessment of DLD. The results of our study provide SLTs
798 with a description of specific verb morphology difficulties in Arabic-speaking children with
799 DLD. Significant differences between children with DLD and TD controls were found in using
800 present tense and verbs with feminine inflections. The findings indicate that SLTs should
801 consider targeting these structures in the assessment and intervention of PA children with DLD.

802 ***Limitations***

803 One of the limitations was the small sample size of the DLD group. This is due to the limited
804 number of clinics in [REMOVED FOR REVIEW] from which this group was recruited. Future

805 studies are recommended to include larger sample sizes. The study provides results about the
806 deficits of verb morphology production only and no data on children's comprehension of verb
807 morphology. To achieve a full understanding of the underlying mechanisms of DLD, other
808 aspects of verb morphology should be examined. These should include comprehension and
809 grammaticality judgment tasks, tasks investigating 1st and 2nd person morphemes and tasks
810 which target derivational as well as inflectional morphology.

811 ***Conclusion***

812 The findings show that Palestinian Arabic-speaking children with DLD present with deficits
813 in the production of verb morphology relative to typically developing children. Inflected verbs
814 with increased markedness including present tense and feminine verb form were more
815 challenging for the DLD group than past tense, masculine verb forms, respectively. For the TD
816 and DLD groups, the most frequent tense and agreement error patterns included omissions of
817 the target morphemes. The omission of target morphemes often resulted in the children
818 producing structurally simpler (less marked) verb forms instead of marked verb forms. And
819 although it seemed that the DLD group was more accurate with some stressed than unstressed
820 forms, the scores of the DLD group were still lower than the TD group. Future studies would
821 need to include larger sample sizes to increase statistical power and generalizability of the
822 findings, investigate other aspects of verb morphology, including both production and
823 comprehension consider other language domains, such as syntax, phonology and semantics
824 and employ longitudinal designs to provide more in-depth knowledge of Arabic language
825 acquisition.

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829 children, and in particular, [REMOVED FOR REVIEW] for their help in recruiting children
830 with DLD.

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APPENDIX 1

Individual raw scores of the background measures and the verb elicitation task for the TD and DLD groups

subject	gender	age	MPU	CL-NWR (score out of 30)	CPM (score out of 36)	% of correct verbs
DLD1	M	67	2.88	17	20	55
DLD2	M	69	3.14	19	21	70
DLD3	F	84	4.06	16	23	60
DLD4	F	85	4.1	12	20	51
DLD5	M	52	3.21	13	12	90
DLD6	M	58	3.12	10	18	65
DLD7	M	50	2.62	11	11	68
DLD8	M	94	6.27	23	19	91
DLD9	M	54	3.22	16	12	88
DLD10	M	48	2.19	9	10	78
DLD11	F	56	3.21	16	12	86
DLD12	M	66	4.98	18	16	96
DLD13	M	61	3.36	21	9	100
DLD14	F	89	3.77	17	14	78
TD1	M	57	6.47	30	19	100
TD2	M	59	5.21	30	14	98
TD3	M	71	4.19	30	18	100
TD4	F	75	5.46	30	16	100
TD5	F	42	2.97	19	8	91
TD6	M	60	5.1	30	17	100
TD7	F	66	5.26	29	21	100
TD8	F	56	3.46	28	18	96
TD9	F	84	6.31	30	21	100
TD10	F	54	3.93	30	14	93
TD11	F	56	5.11	28	15	96
TD12	F	36	2.41	16	NA	65
TD13	M	83	5.89	30	22	100
TD14	F	54	4.9	27	17	98
TD15	M	48	3.93	24	15	96
TD16	M	85	6.01	30	21	100
TD17	M	80	5.68	30	15	100
TD18	M	79	5.13	30	19	98
TD19	M	68	4.88	29	19	98
TD20	F	51	3.79	27	14	98
TD21	M	65	3.92	25	21	98
TD22	M	96	7.61	30	23	100
TD23	M	87	6.58	30	20	100

TD24	M	41	2.83	19	9	80
TD25	M	90	7.24	30	20	100
TD26	M	73	5.96	30	18	100
TD27	F	39	3.87	19	NA	73
TD28	F	43	4.21	21	8	80
TD29	F	47	4.53	25	10	91
TD30	M	49	4.69	23	15	95
TD31	M	43	3.91	20	10	78
TD32	M	55	5.45	30	23	100

965 *Note.* MPU = Mean Morpheme per Utterance. CI-NWR = Crosslinguistic Non-word
966 Repetition. CPM = Colored Progressive Matrices.

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APPENDIX 2

List of verbs used in the verb elicitation task

Pair	Number Agreement	Gender Agreement	Present (A)	Tense	Past (B)
			A. bit.qat ^ʕ .tʕi ^ʕ * cut-PRES-3FS		A. qat ^ʕ . tʕa. ʕat cut-PAST-3FS
			B. byir.bu.tʕu tie-PAST-3P		B. ra.ba.tʕu tie-PAST-3P
Practice items					
1.			1. <u>biyo</u> :kil eat-PRES-3MS		1. ʔa.kal eat-PAST-3MS
2.			2. <u>byif</u> .rab drink-PRES-3MS		2. ʃi.rib drink-PAST-3MS
3.			3. byi. <u>yas</u> .sil wash-PRES-3MS		3. yas.sal wash-PAST-3MS
4.		Masculine	4. biy. <u>maf</u> .ʃit brush-PRES-3MS		4. <u>maf</u> .ʃat brush-PAST-3MS
5.			5. <u>byir</u> .sum draw-PRES-3MS		5. ra.sam draw-PAST-3MS
6.			6. byi. <u>law</u> .win paint-PRES-3MS		6. <u>law</u> .wan paint-PAST-3MS
7.			7. byi. <u>yib</u> .ri sharpen- PRES-3MS		7. ba.ra sharpen- PAST-3MS
8.			8. <u>byif</u> .tah open-PRES-3MS		8. fa.tah pray-PAST-3MS
9.	Singular		9. bit. <u>far</u> .ʃi brush-PRES-3FS		9. <u>far</u> .ʃat brush-PAST-3MS
10.			10. <u>btik</u> .tub write-PRES-3FS		10. <u>kat</u> .bat write-PAST-3FS
11.			11. <u>bit</u> .qus ^ʕ cut- PRES-3FS		11. qas ^ʕ .s ^ʕ .at cut-PAST-3FS
12.		Feminine	12. bit. <u>naf</u> .ʃif dry-PRES-3FS		12. <u>naf</u> .ʃa.fat dry-PAST-3FS
13.			13. <u>bitf</u> .rab drink- PRES-3FS		13. ʃir. <u>bit</u> drink-PAST-3FS
14.			14. <u>btaʕ</u> .tʕi: give- PRES-3FS		14. aʕ.tʕat give-PAST-3FS
15.			15. bit. <u>taʕ</u> .mi feed- PRES-3FS		15. <u>taʕ</u> .mat feed-PAST-3FS
16.			16. <u>byil</u> .bi.su wear-PRES-3PL		16. lib.su wear-PAST-3PL
17.			17. byi. <u>nad</u> ^ʕ .fu clean-PRES-3PL		17. <u>nad</u> .d ^ʕ a.fu clean-PAST-3PL

18.		18. <u>bi</u> f.ra.bu drink -PRES-3PL	18. <u>fi</u> r.bu drink -PAST-3PL
19.		19. byi. <u>law</u> .nu paint -PRES-3PL	19. <u>law</u> .wa.nu paint -PAST-3PL
20.		20. <u>byi</u> k.tu.bu write -PRES-3PL	20. <u>ka</u> .ta.bu write -PAST-3PL
21.		21. <u>byi</u> n.fu.χu blow -PRES-3PL	21. <u>na</u> .fa.χu blow -PAST-3PL
22.		22. <u>byi</u> l.ɕa.bu play -PRES-3PL	22. liɕ.bu play -PAST-3PL
23.		23. <u>bi</u> n.fu.ru hang -PRES-3PL	23. <u>na</u> .fa.ru hang -PAST-3PL
24.	Plural	24. <u>byi</u> f.ta.hu open -PRES-3PL	24. <u>fa</u> .ta.hu open -PAST-3PL
25.		25. byi. <u>maf</u> .tu brush -PRES-3PL	25. <u>maf</u> .fa.tu brush -PAST-3PL
26.		26. byi. <u>far</u> .fu brush -PRES-3PL	26. <u>far</u> .fu brush -PAST-3PL
27.		27. <u>byi</u> r.bu.tu tie -PRES-3PL	27. <u>ra</u> .ba.tu tie -PAST-3PL
28.		28. byi. <u>naf</u> .fu dry -PRES-3PL	28. <u>naf</u> .fa.fu dry -PAST-3PL
29.		29. byi. <u>qas</u> ^ɕ .s ^ɕ u cut -PRES-3PL	29. <u>qas</u> ^ɕ .s ^ɕ u cut -PAST-3PL
30.		30. <u>byi</u> f.la.hu takeoff -PRES-3PL	30. <u>fi</u> l.hu takeoff -PAST-3PL

Note. PRES-3MS = present 3rd person masculine singular. PAST-3MS= past 3rd person masculine singular. PRES-3FS= present 3rd person feminine singular. PAST-3FS= past 3rd person feminine singular. PRES-3P= present 3rd person plural. PAST-3P= past 3rd person plural.

*underlined syllable are stressed.