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The Strong Continuity Hypothesis: Evidence from Arabic-speaking children data *

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Abstract: This paper examines the acquisition of subject-verb agreement inflections in the natural speech corpus of two mono-lingual children speaking Yemeni Ibbi Arabic (YIA) between 2 and 3 years old. The two children are Ibrahim and Wala (between the age of 2;1 and 2;10) with Mean Lenghth of Utterance (MLU) range of 2.72 to 3.23 for Ibrahim and 2.9 to 3.27 for Wala. YIA, as a variety of Arabic, has rich and complex morphological system with a fusional type. Verbs are inflected with tense and agreement. Each verbal inflection is marked for person, number, and gender agreement. However, this paper attempts to explore how agreement forms are acquired by YIA-speaking children and examines when YIA children distinguish between first, second, and third person agreement, singular and plural, masculine and feminine agreement forms. The paper argues that agreement inflections (person, number, gender) are available to children early, thereby supporting the Strong Continuity Hypothesis (Lust, 1999). Moreover, the results give evidence to Wexler's Hypothesis (1998), Very Early Knowledge of Inflection (VEKI), which says that children know the grammatical and phonological properties of inflections in a language in the earliest stages when they enter the two-word stage. Similarly, this study tests Hoekstra and Hyams' (1995) Early Morpho-syntactic Convergence (EMC) which proposed that children acquire the specifics of inflections of the target language at an early stage.

Keywords: verbal agreement inflections, Yemeni Ibbi Arabic, strong continuity hypothesis, very early knowledge of inflection

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1. Introduction

A look at the acquisition of subject-verb agreement in various languages including Arabic with rich morpho-syntactic features with subjects are realized either overtly or covertly as null is great addition to the literature of language acquisition. Arabic has rich agreement system where each verbal inflection is marked for person, number, and gender agreement which appear as prefixes and suffixes in the imperfective/present tense and as suffixes in the perfective/past tense.

In child language acquisition research, the acquisition of functional categories including the agreement in the early speech of children has led to interesting arguments. However, emergence of functional structure involves three main debatable hypotheses: (a) maturational, (b) weak continuity, and (c) strong continuity. The maturational hypothesis states that early grammar differs from adult grammar in that children younger than 2;6 (years; months) lack functional categories (Lebeaux, 1988; Ouhalla, 1991; Platzack, 1990; Platzack & Holmberg, 1989; Radford, 1990). Most importantly, it is assumed "that certain principles mature. The principles are not available at certain stages of a child's development, and they are available at a later stage" (Borer & Wexler, 1987:124). On the other hand, the weak continuity hypothesis argued that in child grammar the knowledge of functional categories emerges gradually, stemming from a bare verb phrase (VP) to the inflection phrase (IP) to the CP. Under this view, researchers suggest that the full inventory of functional categories in adult grammar is absent in early child grammar (Clahsen, 1990; Clahsen, Penke & Parodi, 1993; Meisel & Müller, 1992). However, the weak continuity hypothesis reflects a view of the acquisition of syntactic knowledge under which the developing grammar gradually approaches the adult grammar by slowly adding functional categories, and the CP appears at later stages of acquisition.

In contrast to the previous hypotheses, the strong continuity hypothesis (SCH) (Lust, 1999) emphasizes the availability of complete functional structure from the initial state and conforms to the principles of Universal Grammar (UG). This hypothesis parallels the standard Government and Binding framework (Chomsky, 1982) in that all clauses are represented by a full CP projection. Under the SCH, the initial state refers to the onset of first language acquisition, even before experience (Crain, 1994), and "UG remains continuously available throughout the time course of first language acquisition. UG does not itself change during this time course" (Lust, 1999:118). Additional support for the SCH was also provided by Poeppel and Wexler's (1993) full competence hypothesis which provided evidence for the existence of functional categories in early German grammar, including IP and CP (note, however, that optional infinitives were found in matrix clauses). Other studies that lend further support to the SCH include Hyams' (1992a) findings regarding the availability of fully functional structure in early grammar. The proponents of

the SCH say that children start off with a full CP projection; and, contrary to the maturational view, "children abide by universal principles at all stages of language development" (Crain, 1994:371).

However, this paper suggests that children acquire functional categories very early in languages with rich agreement system like Arabic. Therefore, this study attempts to explore that agreement inflections (person, number, gender) are available to children early, thereby supporting the Strong Continuity Hypothesis (Lust, 1999). Moreover, the results give evidence to Wexler's Hypothesis (1998), Very Early Knowledge of Inflection (VEKI), which says that children know the grammatical and phonological properties of inflections in a language in the earliest stages when they enter the two-word stage. Similarly, this study tests Hoekstra and Hyams' (1995) Early Morpho-syntactic Convergence (EMC) which proposed that children acquire the specifics of inflections of the target language at an early stage.

The study aims at answering the following questions:

(1) How are person, number, and gender verbal morphology acquired in YIA?

(2) When does the distinction between 1st, 2nd, and 3rd person emerge and is acquired?

(3) When does the distinction between singular and plural emerge (first use) and is acquired?

(4) When does the distinction between masculine and feminine emerge and (first use) and is acquired?

(5) Do children substitute some forms for the other?

2. Theoretical background: The adults speech

Yemeni Ibbi Arabic (YIA) is a dialect of Arabic, and like many Arabic dialects, belongs to the Afro-Asiatic family of languages which include languages like Aramaic, Ethiopian, Syriac and Hebrew. YIA is a dialect spoken in central Yemen mostly in Ibb governorate and some parts of Taiz. The approximate numbers of known users of YIA are about 1,700,000. When it comes to and study of linguistic properties and the acquisition, the ibbi dialect has got little attention from researchers, Qasem (2014) and Qasem & Sircar (2017), though other dialects like Sana'ani and Taizi Yemeni dialects have received some attention, such as Al-Bothigi (2012). YIA has many linguistic (mainly phonological and morphological) differences and similarities with Modern Standard Arabic (MSA) and other Arabic varieties.

Yemeni Ibbi Arabic like Modern Standard Arabic (MSA) and its regional variants has 'non-concatenating templatic' morphology. In such a morphological system, vocalic infixes are discontinuously inserted between members of two to four-consonantal roots (known as radicals) (Erwin, 1963; Bakalla, 1979; McCarthy & Prince, 1988; Ratcliffe,

1998). The latter contains the lexical content of the word and appears in many different derivationally related forms. The consonantal roots can be three consonants (trilateral) or four consonants (quadrilateral) or more but the quadrilateral forms are rare (Haywood & Nahmad, 1962; Wright, 1967). The example given ubiquitously in the literature involves the root √*ktb* meaning roughly 'writing' and is shown in Table 1.

Table 1. Derived forms from the root √*ktb*

Root	Meaning	Template
Kataba	he wrote	CaCaCa
Yaktub	he writes	yaCCuC
Kttaba	he made someone write	CaCCaCa
Kitaab	book	CiCaaC
Kutub	books	CuCuC
Katib	writer	CaCiC
kuttaab	writers	CuCCaaC
maktab	desk/office	maCCaC
makaatib	offices	maCaaCiC
maktaba	library, bookstore	maCCaC
maktabaat	libraries	maCCaCaat
mukaatib	correspondent, reporter	muCaaCiC

As Table 1 shows, the root can appear in quite a few different patterns and the forms can vary across all lexical categories (noun, verb, adjective) and include a variety of prefixes and prosodic/vocalic templates. The morpho-phonology of Arabic and Hebrew was first examined in Chomsky (1965), later in McCarthy (1979, 1981), and subsequent work has focused on understanding the metrical and segmental properties associated with non-catenative templatic morphological systems. On the morpho-syntactic side, researchers have explored the relevance of the root to the syntactic determination of argument structure and where and how the parts of the verb are distributed and realized across morpho-syntactic space.

2.1 Word order and agreement

As in pro-drop languages, word order in Arabic and many dialects of Arabic is flexible. Though having various word orders[①], we will focus on two main word orders in this discussion. The first word order includes the subject realized in preverbal position as subject-verb-object (SVO) as in example (1a) below. In the second word order the subject can be realized in postverbal position as verb-subject-object (VSO) as in the example (1b)

[①] For more details about word order and agreement in the Standard Arabic see Al-Asbahi (2002) and Saeed (2011).

below. In the second word order, the subject can be in the post verbal position even when dropped as in (1c).

(1) a. *Mohammed* *ʔashtari* *talafoon.* (SVO)
Mohammed buy.PERF.3MS telephone
'Mohammed bought a telephone.'

b. *ʔakalah* *Hend* *ʔal-xubz* (VSO)
eat.PERF.3FS Hend the-bread
'Hend ate the bread.'

c. *ʔakal-eh* *ʔal-xubz* (VSO)
eat.PERF.3FS the-bread
'She ate the bread.'

YIA has subject-verb-object (SVO) (2a) and verb-subject-object (VSO) (2b) word orders; the VSO being treated as the unmarked order as it used more frequently in different contexts.

(2) a. *Ali* *shaat* *ʔal-kurah*.
Ali kick.PERF.3MS the-ball
'Ali kicked the ball.'

b. *baaʕ* *ʕammi* *ʔa- ʔarTHiyah* *ʔams*.
sell.PERF.3MS uncle-my the land yesterday
'My uncle sold the land last week.'

In this part, we present the subject-verb agreement system in YIA in comparison to the subject-verb-agreement system in the Modern Standard Arabic (MSA) to bring out the differences.

Standard Arabic has two types of agreements, full and partial, with respect to two dominant word orders, SVO and VSO respectively. In SVO, there is full agreement where subject and the verb agree in person, number, and gender as in (3a); and in VSO, there is partial agreement: the subject and verb agree in person and gender, but not number as in (3b).

(3) a. *t-taalibaat-u* *ʔakal-na.*
the-student.FP-NOM eat.past.3FP
'The students ate.' Full Agreement (SV)

b. *ʔakal-at* *t-taalibaat-u.*
eat.past.3FS the-student.FP-NOM
'The students ate.' Partial Agreement (VS) (Benmamoun, 2000:121)

(4) a. *ʔalTalabat* *ʔakal-einʔ* *a-tufaaH.* (SVO)
The-students-3FP eat-PERF.3FP the-apples
'Ali and Ahmed ate the apple.'

b. *ʔakal-ein* *ʔalTalab-at* *ʔa-tufaaHah.* (VSO)
eat-PERF.3FP the-student-3FP the-apples
'The student ate the apples.'

Unlike Modern Standard Arabic, the agreement in YIA has always full-subject agreement whether the word order is SV or VS as it is shown in the examples, (4a) and (4b). Interestingly, the verbs forms did not change irrespective of the change of the word order. Notice that the verbal overt marker, *-ein* in (4a) and (4b) which is realized for third feminine plural does not change in SV and VS word orders.

2.2 Verbs

Descriptively, verbs are formed by placing two or four consonantal roots in different vocalic templates. The vocalic portions of words convey information concerning tense, aspect, and voice of the verb (as in other dialects and MSA; see McCarthy, 1979; Ryding, 2005). YIA has two tenses/aspects, called the perfect(ive) and the imperfect(ive) in traditional grammars. YIA also inflects verbs for agreement with the subject along the usual φ-featural dimensions of person, number, and gender. That φ-featural agreement is expressed by additional affixation over and above the non-concatenative linearization which integrates the lexical root with tense, aspect, and voice.

YIA verbs agree with the subject in person (first, second, third), number (singular, plural), and gender (masculine, feminine). However, the morphological paradigm is smaller in YIA Arabic than in Modern Standard Arabic; there is no morphological mood distinction (except jussive mood). Moreover, there are no dual markers in the number paradigm. Tense is abstract in Arabic, as well as all its varieties, and therefore is not represented as a morpheme.

Every verb form includes a stem and affixes which are of three types: prefixes or suffixes as or a combination of prefix and suffix. In the past/perfective tense, agreement is encoded as suffix, and in the present/imperfect tense, the prefix encodes person agreement and the suffix encodes number and gender agreement. However, the morphemes affixed to the verbal stem have different phonological forms, which depend on the nature of the consonantal root and vowel harmony.

YIA is a fusional (also called synthetic/syncretic) language, where the inflected affixes signal more than one thing at a time. This is in contrast with the agglutinating languages such as Turkish, Swahili and Tamil, where different inflections have separate and identifiable grammatical categories. For instance, in YIA, the suffix, *u*, in the past form, *Wall-u* 'they went'(5a) stands for third masculine plural and the suffix, *-ein*, as in *ʔashtar-ein* 'they bought' for the third feminine plural (5b).

(5) a. *Wall-u* *ʔal-Hadiiqah.*
go.PERF.3MP the-park

'They went the park.'

b. *ʔashtar-ein* *kutub.*
buy-PERF.3FP books
'They bought books.'

2.3 Tense/Aspect

YIA, like Standard Arabic, has both, tense and aspect, which are not clearly distinguishable in the literature on Arabic linguistics and this has led to constant debate[①]. In our study, we use them as single feature T/A for matters of convenience. like Standard Arabic, YIA has two tense/aspect forms; perfective and imperfective. What distinguishes both perfective and imperfective is that the affixation markers added to the consonantal roots of verbs and we refer to them as the indicators of tense. The perfective form has only suffixes and imperfective form has prefixes and suffixes as illustrated below.

2.3.1 The perfective form

The perfective form is mainly used in past tense contexts and may be used in what is called hypothetical past, as in conditional clauses introduced by it. The perfective aspect occurs as a part of tense to indicate completeness/completion of action. The perfective form of the verb usually occurs in the past tense like many other languages where there is categorical past tense feature. This appears in many syntactic representations of sentences as in (6) below in the MSA.

(6) *žaaʔa* *ʔams.*
come.past.3ms yesterday
'He came yesterday.' (Benmamoun, 2000:24)

Like MSA, YIA has the same representation where perfective appears within the past tense category. The examples (7a) and (7b) explore the similar representation of the past tense in both, MSA and YIA.

(7) a. *Saafar-u* *Sana'a* *ʔams*.
travel.PERF.3MP Sana'a yesterday
'They travelled to Sana'a yesterday.'

b. *ʔal-waziir* *gaa* *Ibb* *ʔams.*
the-minister come.PERF.3MS Ibb yesterday

① Many linguists have not clearly differentiated between the two forms, aspect and tense. Whether Arabic is considered as a tense-language or an aspect-language has led to a debate. Fassi Fehri (1993:141) clearly said that "the literature on the tense and aspect in Arabic has been dominated by the dispute on whether verbal inflection expresses tense or only Aspect". On the other hand, traditional grammarians claimed that inflections represent (deictic) tense whereas many western Semiticists took verbal forms to stand for aspect. Benmamoun (2000) mentioned that the dispute on whether Arabic is 'Tense language' or 'Aspect Language' has led to difficulty and unavailability of general and right descriptions of the Arabic temporal system.

'The minister came (to) Ibb yesterday.'

The agreement features in the perfective form is realized by adding suffixes as shown in Table 2.

Table 2. Verbal agreement in the perfective form

Person	Number	Gender	Suffix	Perfective	Gloss
First	Singular	F/M	*-k*	*katub-k*	I wrote
	Plural	F/M	*-na*	*katab-na*	We wrote
Second	Singular	M	*-k*	*katab-k*	You wrote
	Singular	F	*-ki*	*katab-ki*	You wrote
	Plural	M	*-kum*	*katab-kum*	You wrote
	Plural	F	*-kein*	*katab-kein*	You wrote
Third	Singular	M		*Katab*	He wrote
	Singular	F	*-ah*	*katab-ah*	She wrote
	Plural	M	*-u*	*katab-u*	They wrote
	Plural	F	*-ein*	*katab-ein*	They wrote

Note: M= masculine, F= feminine

The agreement features in the perfective form is realized by adding suffixes as shown in Table 2.

From Table 2, we can observe many things about Yemeni Ibbi Arabic perfective forms: (a) third person masculine singular (3MS) has a zero morpheme for agreement (e.g., *katab,*'He wrote'), (b) 1S and 2MS have a homonymous form *-k*; (c); the suffix, *ki* stands for 2FS; (d) the suffix *-na* stands for 1P, *-kum* for 2MP, *-kein* for 2FP, *-ah* for 3FS, *-u* for 3MP, and *-ein* for 3FP. Note that in Arabic the (vowel) stem changes in some other verbs and it is not consistent with all the verbs in YIA (e.g., *shireb*, 'he drank not like', *katab*, 'He wrote').

2.3.2 The imperfective form

In contrast to the perfective form, the imperfective form refers to present, progressive, habitual actions, and future events.[①] The imperfective form carries different inflectional system in Arabic compared to the perfective form. The imperfective form is realized by (a) prefixes; however the prefixes are inflected for person (Benmamoun, 2000) (they are *ʔa-*, *ti-*, *yi-*, and *ni-*) and (b) suffixes which stand for number and gender (many imperfective

[①] For Benmamoun (2000) past tense has an abstract feature of tense whereas present (imperfective) does not carry temporal or aspectual information giving the reasons that the imperfective occurs in various contexts such as (a) present, past, future, non-finite clauses. He argued that it is difficult to come up with a temporal/aspectual feature that covers all these instructions (habitual, progressive, context of auxiliaries, negative particles, and embedded clause as non-finite. Therefore Benmamoun referred to the imperfective as the default form.

forms have zero morphemes as shown in Table 3).

Table 3. Verbal agreement in the imperfective form

Person	Number	Gender	Suffix	Imperfective	Gloss
First	Singular	F/M	*ʔa-*	*ʔa-shrab*	I drink
	Plural	F/M	*ni-*	*ni-shrab*	We drink
Second	Singular	M	*ti-*	*ti-shrab*	You drink
	Singular	F	*ti-i*	*ti-shrab-i*	You drink
	Plural	M	*ti-u*	*ti-shrab-u*	You drink
	Plural	F	*ti-ein*	*ti-shrab-ein*	You drink
Third	Singular	M	*yi-*	*yi-shrab*	He drinks
	Singular	F	*ti-*	*ti-shrab*	She drinks
	Plural	M	*yi-u*	*yi-shrab-u* [①]	They drink
	Plural	F	*yi-ein*	*yi-shrab-ein*	They drink

Note: M= masculine, F= feminine

Table 3 characterizes two aspects of the imperfect form in YIA. (a) The imperfective tense has four clear prefixes (*ʔa-*, *ni-*, *ti-*, and *yi-*). The prefix, *ʔa-* stands for 1S, *ni-* for 1P, *ti-* for the 2nd person, *yi-* represents all 3rd person forms except 3FS, which has a different prefix *ti-*. (b) Three overt suffix morphemes are added to the imperfective verbs (*-i*, *u*, and *ein*). The suffix *-i* stands for the 2FS, the suffix *-u* stands for 2MP and 3MP, and the suffix *-ein s*tands for 3FP.

In the imperfective verbs, there is marker as prefix either *li-/la-* as prefix to show progressive as in (8a-b) or as habitual interpretations (8c-d). This fact is also applicable to the YIA in all the patterns of the paradigm.

(8) a. *li-yi-tghaduu* *thalHiin.*
be-3.eat.IMPERF.MS now
'They are eating now.'

b. *li-yi-sbaH-u.*
be-3.swim.IMPERF.MP
'They are swimming.'

c. *ʔabi* *li-yitaSel* *kul* *jawm.*
father-my be-3.call.IMPERF.MS every day
'My father calls every day.'

d. *huh* *li-yi-zuur* *ʔakh-uh* *kul* *jawm.*
he hab-3.visit.IMPERF.MS brother-his every day

[①] Note that the prefix of the 3MP/3MF might be *yu-* and not always *yi-* depending on the verbs like with verb *yuktbu* ('they write') due to phonological reasons.

'He visits his brother every day.'

Benmamoun (2000) illustrated similar facts from other dialects of Arabic, such as dialects, Moroccan and Egyptian Arabic that have prefixes, *ta-/ka-/bi-* to denote progressive and habitual meaning. MSA lacks the prefixes as shown in (9) below.

(9) *ʔal-ʔawlaadu* *ya-lʕab-uun.*
the-children 3m-play-mp-ind
'The children are playing.' (MSA) (Benmamoun, 2000: 32)

In YIA, the future form is not realized by any lexical element like English 'will' or 'going to' but is marked by the appearance of a glottal stop and a vowel *ʔa* at the beginning of the verb as in (10).[①]

(10) *ʔa-ti-katub* *ʔalʔimtiHaan* *ghudwah.*
will-write-FS the-exam tomorrow
'She will write the exam tomorrow.'

Unlike MSA, the modern dialects of Arabic do not have an exclusive morpheme or particle to refer to the future form. But the future form is often marked with the prefix *ʔa* attached to the verb stem. Consider the future form of some verbs in YIA as in Table 4.

Table 4. Agreement affixes in the future form in YIA

Person	Affix+ Verb + letter	Gloss
1M/F	***ʔa****katub al-risaalah*	I will write the letter
2MS	***ʔa****-tikatub al-risaalah*	You will write the letter
2FS	***ʔa****-tiktubi al-risaalah*	You will write the letter
3MS	***ʔa****-yiktub al-risaalah*	He will write the letter
3FS	***ʔa****-tiktub al-risaalah*	She will write the letter
3MP	***ʔa****-yiktubu al-risaalah*	They will write the letter
3FP	***ʔa****-tiktubein al-risaalah*	They will write the letter

The marker of future timing varies from one dialect to another. In Moroccan Arabic, for example, the future time is expressed by the participial predicate *yadi* 'going' and its shortened form *ya* whereas in the Egyptian dialect the proclitic *ha,* which is derived from the participial predicated *raayih* 'going' is used to refer to the future (Benmamoun, 2000).

The study covers (a) the emergence of verbal agreement inflections, (b) types of errors children make when they acquire agreement inflections.

The study looks at the acquisition of verbal inflections in a dataset of two monolingual children, YIA as many other dialects of Arabic has complex and rich verbal morphology

① In contrast to YIA, the future form in MSA is realized by a separate particle, *sawafa* placed before the verb as in "*Sawfa ʔu-saafiru* (Will 1s-travel, 'I will travel.')" or the clitic, *sa*, as in "*sa-u-saafiru* (fut-1s-travel, 'I will travel.')". (Benmamoun, 2000:33)

with fusional type system as each inflection carries person, number, and gender.

3. Methodology

The data examined for this study is from mono-lingual Arabic speakers, Ibrahim (2;1 to 2;5) and Wala (2;6 to 2;10) which was collected longitudinally for five months. Two methods of data collection were used. The natural production data and informal elicited production data methods were used in the video recording sessions. The speech data was coded manually to find occurrences of subjects in YIA. In counting uses of the constructions (null/overt; pro-noniminal/nominal subjects; preverbal/postverbal subjects), all imitations of adult utterances, repetition of the same utterances in the context, and formatic expressions were discarded. All utterances containing overt subjects were counted, categorized and tabulated. The relevant utterances were coded for subject type (pronominal/ nominal) and position (SV, VS) to check for acquisition of the pertinent use (age of emergence of the target utterances) was noted down.

4. Results and discussions

The results of the study showed that YIA-speaking children have the knowledge of the agreement paradigm from the earliest utterances. We look at how data demonstrate the Strong Continuity Hypothesis (SCH) (Lust, 1999) which argues that children acquire the functional categories early. Moreover, the results give evidence to Wexler's Hypothesis (Wexler, 1998), Very Early Knowledge of Inflection (VEKI) which says that children know the grammatical and phonological properties of inflections in a language in the earliest stages when they enter the two-word stage.

The main concern of this study is to investigate the emergence of subject verb-agreement (person, number, and gender) in imperfective and perfective contexts in the early speech of YIA-speaking children. The reason why we looked at imperfective and perfective contexts separately is because in the former agreement features are distributed – person (and gender) as prefix and number (and gender) as suffix, while in the latter a morpheme for person, number and gender is suffixed to the verbal stem. It was found in the earlier analysis from Ibrahim's and Wala's data that YIA-speaking children used person agreement productively and they emerge as early as 2;1-2;2. There were almost no errors in person agreement. The average rate of person and number errors in Ibrahim's and Wala's data was very low, at 9.9% in Ibrahim's and 4.9% in Wala's respectively. The error in both children's data involved use of 3rd person in 1st and 2nd person context.

The results showed that singular forms emerged before the plural forms (in second person and third person in present forms), while the acquisition of masculine forms preceded the acquisition of feminine forms and there was a 4-6 months delay in the

emergence of feminine forms in both past and present forms. In the present, the third feminine plural (3FP) occurs two months later than third masculine plural (3MP) (2;8 and 2;6 in Wala's data). In the past forms, third feminine plural (3FP) occurs seven months later than third masculine plural (3MP) at 2;9 in Wala's data and in Ibrahim's 2;2. The results of number agreement emergence in children's data show that when feminine and plural come together, YIA-speaking children have a problem that is why the feminine plural emerged late compared to the other forms.

We found that most errors were seen where the children had substituted the plural forms with singular forms and feminine forms with masculine forms. For example, Ibrahim uses the verb, *diza* 'He went' (2;3) for *gizaʔeh* 'she went'. In the case of children in YIA using singular for plural, Wala in her corpus, uses the singular form in the verb, *yiʔasal* 'he is taking shower' (2;6) instead of the plural form *yiGasal-u* 'they are taking shower'. This indicates that YIA-speaking children acquire masculine before feminine and singular before plural forms.

The majority of the substitutions in the agreement paradigm were in the third person for plural and/or feminine forms, and most of them (i.e. 3MP, 3FS, 3FP) were substituted with 3MS, which is the unmarked form since it doesn't have a zero morpheme, both in the imperfective and the perfective contexts. This is true with another pro-drop language Greek, where 3MS has been claimed to be the most unmarked form of the inflectional paradigm because it is used in adult Greek in impersonal constructions where no thematic subject is required and is used in the non-finite form of the verb in complex tenses that is marked with perfective aspect (Varlokosta et al., 1996, 1998). This is the form that is used by children acquiring Greek for plural forms.

The errors in agreement cast no doubt on the availability of functional categories, for the simple reason that they are used alongside other fully inflected forms (those which have overt suffixial morphemes). The errors are morphological and cognitive rather than syntactic. Similar delays in the acquisition of plural and feminine have been cross-reported linguistically.

The data shows that functional categories (tense and agreement) appear early in the speech of children speaking YIA. As we mentioned earlier, the acquisition of tense and agreement as functional categories has attracted many researchers to test the availability/absence of functional categories in the early speech of children cross-linguistically. The findings of the study support the Strong Continuity Hypothesis (SCH)(Lust, 1999) which argues that children acquire the functional categories early. Furthermore, the results give evidence to Wexler's Hypothesis (Wexler, 1998), Very Early Knowledge of Inflection (VEKI) which says that children know the grammatical and phonological properties of inflections in a language in the earliest stages when they enter

the two-word stage. Therefore, the distribution and the accuracy of marking verbal agreement inflections early in the data of Ibrahim and Wala support the argument in VEKI that verbal inflections are available in children's grammar in earliest stages of language acquisition.

4.1 Acquisition of agreement in early YIA

This section examines data on the acquisition of person, number and gender morphology in the spontaneous speech of the two monolingual Yemeni Ibbi Arabic (YIA) children. In YIA, the agreement inflections for person, number, and gender are realized in the imperfective verbs by attaching a person prefix and number and gender suffixes to the verb stem. In the perfective verbs, the morpheme for person, number, and gender is suffixed to the verb stem. Tense is abstract without overt morpheme.

Since YIA has rich inflectional morphology, it is expected that agreement features will be learnt early with good accuracy. To ascertain these facts, we looked at the age of emergence of the agreement features and the age at which they are mastered. The age of emergence and mastery are reported separately for the imperfective and the perfective aspects since the placement of morphemes differ in the two aspects. The results show that person and number morphology is used correctly and productively from a very early age, though the plural and the feminine forms emerge later, particularly the second and the third plural forms.

Children's spontaneous speech was analyzed for production (age of emergence, mastery and frequency of use) and errors made in the use of agreement features. In subjectless utterances verb agreement accuracy was established by examining the person, number, gender of the subject deciphered from the context in which the utterance was produced. In this analysis, utterances with nonfinite forms (i.e. imperative forms) were not included, since these forms do not show person agreement.

4.2 Age of emergence of agreement morphemes

Table 5 and Table 6 show the age of emergence of agreement features in the verbal utterances of Ibrahim and Wala. Since Wala was an older child (2;6) at the time of data collection, some forms appear in her data at 2;6-2;7 though they could have been used earlier than this, the research does not have information about that. Therefore, we present data with a superscript (1) only when a form occurs for the first time in Wala's data, with the form not emerging in Ibrahim's data from 2;1-2;5.

Table 5. Emergence of agreement features in the imperfective form in YIA

	Ibrahim		Wala	
	Age	Frequency	Age	Frequency
1S	2;1	25	2;6	39

1P	2;1	4	2;6	3
2MS	2;1	1	2;6	4
2FS	-	-	2;7 ①	2
2MP	-	-	-	-
2FP	-	-	-	-
3MS	2;1	6	2;7	6
3FS	2;2	2	2;7	3
3MP	-	-	2;8	1
3FP	-	-	2;8	8

Table 6. Emergence of agreement features in the perfective form in YIA

	Ibrahim		Wala	
	Age	Frequency	Age	Frequency
1S	2;3	1	2;6	1
1P	2;2	1	2;6	2
2MS	2;3	-	2;10	1
2FS		-	2;10 ②	1
2MP	-	-	-	-
2FP	-	-	-	-
3MS	2;1	9	2;6	6
3FS	2;2	2	2;6	3
3MP	2;2	2	2;9	3
3FP	-	-	2;9	1

All person agreement (first, second, and third) appeared as early as 2;1-2;2 in Ibrahim's data. The first singular (1S), first plural (1P), second masculine (2MS), and third masculine singular (3MS) appeared at 2;1 in the imperfective tense in the speech of the younger child, Ibrahim and the first singular (1S), first plural (1P), and second masculine singular (2MS) at 2;3 in the perfective tense. The third masculine singular, (3MS) in the past was learnt earlier than the other person agreement at 2;1. This showed that the person agreement per se was not an issue in the acquisition of verbal agreement in YIA children. Since all three persons were found at 2;1 (or even earlier!), this learning was quick and later we show that this was also error free.

Turning to number agreement, we found that singular emerged earlier than plurals in all persons except in the first plural occurs as early as in the imperfective tense (2;1). The

① Emergence of the first time in Wala's speech; no occurrence in Ibrahim's speech.
② Emergence of the first time in Wala's speech; no occurrence in Ibrahim's speech.

second masculine singular (2MS) was learnt before second masculine plural (2MP) which occurred till 2;10; third masculine singular (3MS) in Ibrahim's data occurred as early as 2;1 before third masculine plural (3MS) (Wala: 2;6); third feminine singular (3MS) (Ibrahim, 2;2) occurred before third feminine plural (3FP) (Wala, 2;8).

The trend was also found similar in the perfective tense: the second masculine singular (2MS) was greater than second masculine plural (2MP) (compare Ibrahim: 2;3 and Wala not used till 2;10); third feminine singular (3FS) was greater than third feminine plural (3FP) (compare Ibrahim: 2;2 and Wala: 2;9). In the past tense, we found third masculine singular (3MP) and third masculine plural (3MP) being used around the same age (Ibrahim, 2;2). The advantage of singular number agreement over plural agreement has been attested in the children data in many languages, and the YIA study also fell in line with these with respect to number agreement.

Gender agreement also appeared to be delayed in YIA children. The masculine forms were globally acquired earlier than the feminine forms both in the imperfective and the perfective forms, in all previous (second and third) and in singular and plural forms. Note that second masculine singular (2MS) in the present emerged in Ibrahim at 2;1 but the first use of second feminine singular (2FS) was recorded not in Ibrahim but in the older child, Wala at 2;7. A similar trend was observed in the perfective tense (second masculine singular in Ibrahim at 2;3 and second feminine singular in Wala at 2;10). In the third person forms, we found a different trend, where third masculine singular (3MS) was used around the same age as third feminine singular (3FS). Though there was a month's delay in learning the feminine forms, the difference was not substantial. The difference in the age of emergence was more pronounced in third masculine plural (3MP) and third feminine plural (3FP). In the present, third feminine plural (3FP) occurred two months later than third masculine plural (3MP) (compare Wala 2;8 and 2;6). In the perfective forms, third feminine plural (3FP) occurred seven months later than third masculine plural (3MP) (compare Wala 2;9 and Ibrahim 2;2)[①].

Having looked at the age of emergence of person, number, and gender agreement in Ibrahim and Wala, we quickly look at the frequency of occurrence of different forms. In the Tables 5 and 6 we find that the second masculine plural (2MP) and the second masculine feminine (2FP) are absent in children data even in the last months of data collection in Wala's data at the age of 2;9 or 2;10. This suggests that these forms appear later in YIA. Note that the frequency in these tables denotes the number of times a particular form was used in the month when it 'first' appeared. This was not the total

[①] The pace of learning in the two children, Ibrahim and Wala, might be different, keeping this fact in mind, we need to consider the delay to be ± seven months.

frequency with which a form was used in the entire child corpus. The first time 1P appeared in Ibrahim, 25 tokens are recorded for this form in the imperfective tense and 1 token in the perfective tense. At a later age in the older child, Wala, it was 39 (in present) and 1 (past). The second form that was used with a high frequency was 3MS in Ibrahim (6) in the imperfective and the perfective tense.

The form that emerged at later ages 2;6-2;10 usually are used 1-3 times: 2FS (present, Wala, 2;7=2 and past, Wala, 2;10=1); 2MP (present, Wala 2;6=1). However, the frequency of 3MP use in the past tense in Wala at 2;8 was 8.

From the above analysis, we can summarize that:

(1) Person agreement occurs early at 2;1-2;2.

(2) Singular forms precede plural forms (in second person and third person in present forms).

(3) Masculine forms precede feminine forms and the delay in the emergence of feminine forms is between 1 month to 7 months.

(4) The feminine plural forms are delayed in both past and present forms.

4.3 Accuracy

The accuracy of agreement morphology in Ibrahim's and Wala's speech is summarized in Tables 7 and 8 below. Correct use of person, number and gender morphology is given in percentages and raw scores represented as N (correct instances out of the obligatory contexts created for the respective form). Obligatory context is discerned from the context in which the utterance was produced. Here, incorrect uses were only substitution errors, since there could not have been instances of omission, and also since YIA has a fusional form for the three agreement features. A 90% criterion was used to determine mastery of the form. Forms that reach this criterion are indicated in the tables in bold.

Table 7. Accuracy of agreement features in the imperfective and perfective forms in the Ibrahim-corpus

	Imperfective		Perfective	
	N	%	N	%
1S	292/292	**100**	17/17	**100**
1P	20/24	83.33	6/7	85.71
2MS	5/5	**100**	5/5	**100**
2FS	-*	-	-	-
2MP	-	-	-	-
2FP	-	-	-	-
3MS	58/60	**96.66**	72/73	**98.63**

3FS	13/13	**100**	22/28	78.57
3MP	16/18	88.88	19/20	**95**
3FP	0/1	0	0/1	0

* no occurrence of the form in the child's data

In Ibrahim's speech, the forms that reach the 90% criterion are 1S, 2MS, 3MS, in both imperfective and perfective tense, 3FS in the imperfective tense, and 3MP in the perfective tense. The other forms, usually plural forms – IP, 3MP –are below the 90% criterion but show good learning. 3FP is the most difficult one of the forms with 0% accuracy, however, the frequency of use is 1. The accuracy of 2FS, 2FP, 2MP, 2MP, 2FP forms is not attested because they are not available in Ibrahim's data. This accuracy figures confirm the delay in the learning of the correct plural and gender agreement morphemes.

Table 8. Wala: Accuracy of the agreement features the imperfective and perfective forms in the Wala-corpus

	Imperfective		Perfective	
	N	%	N	%
1S	166/166	**100**	20/20	**100**
1P	11/12	**91.66**	7/8	87.5
2MS	10/10	**100**	1/2	50
2FS	4/4	**100**	1/1	**100**
2MP	-	-	-	-
2FP	-	-	-	-
3MS	113/114	**99.12**	44/45	**97.77**
3FS	67/72	**93.5**	25/33	75.75
3MP	50/66	75.75	3/4	75
3FP	14/15	**93.33**	2/2	**100**

*no occurrence of the form in the child's data

In Wala's corpus that reaches the 90% accuracy criterion are 1S, 2MS, 2FS, 3MS, and 3FP in both imperfective and perfective tense. Wala, the older child, was found using 2FS and 3FP (which did not occur or marginally occurred in Ibrahim's speech) with high levels of accuracy. Though 3FP is known to emerge late and quiet often is replaced by 3MP. However, like Ibrahim, accuracy levels were comparatively lower in 3MP. Also, 90% criterion is reached more in the imperfective agreement forms than perfective agreement

forms. In summary, all singular person agreements were used with higher accuracy than the plural ones, with 1SG and 3SG being the most productive ones.

4.4 Distribution of finite forms

Even though there is a large proportion of correctly inflected verbs, children do not have an access to all agreement forms immediately. Figures 1 and 2 show the percent proportion of person distinctions with age for the two children in the imperfective and perfective tenses.

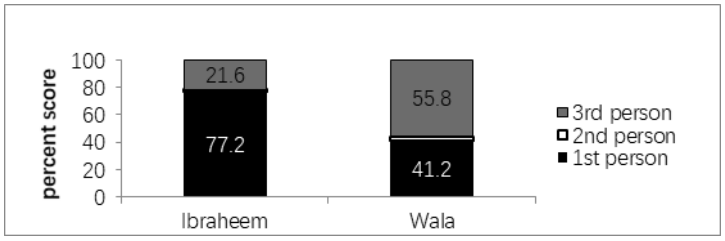

Figure 1 Distribution of person agreement in the imperfective form

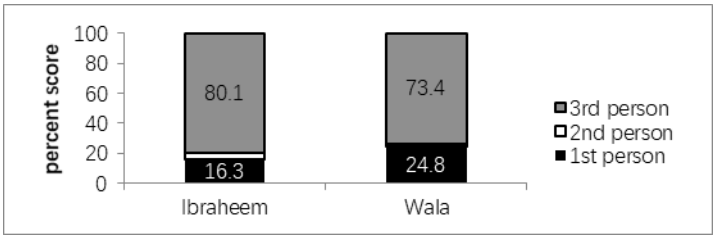

Figure 2. Distribution of person agreement in the perfective form

In Figure 1 the frequency of the first, second, and third person agreement features were compared in the two corpora. Ibrahim used more first person (77.2%) than second (1.2%) and third person (21.6%). Wala, in contrast, used more third person (55.8%) than first (41.2%). This suggests that as children grow up, they use more third person reference in their speech. Similar findings were attested in data of Kuwaiti-speaking children (Aljenaie, 2000), where the first person and third person displaced the high number of occurrence.

Figure 2 shows the frequency of use of person agreement forms in speech of Ibrahim and Wala in the perfective forms. Unlike in the imperfective tense, in the perfective tense the third person is used more often than the first person.

(1) First person is used with higher frequency than other forms in the present contexts and this suggests that the first person in the speech of YIA-speaking children emerge early in the present contexts.

(2) The high frequency tokens of third person occurring in past contexts in the data of Ibrahim and Wala illustrates that children acquire third person in YIA early and suggests that the third person is easier and unmarked form for YIA-speaking.

The results of person morphology analysis support the VEKI hypothesis and Strong Continuity Hypothesis that children in early YIA acquire person morphology early from the age of 2;1.

Figure 3. Distribution of number agreement in the imperfective form

Figure 4. Distribution of number agreement in the perfective form

As seen in Figures 3 and 4, plurals forms were used less often than singular forms in both children and in both tense forms. Other studies also report on the later emergence of plural inflections in the course of language development (Guasti, 1993; Rus, 2006). It is argued that this delay of plurality characterizes verbal and other ways of marking the plurality. Nevertheless, in our data, 1P is early as reported earlier and frequent in Ibrahim's speech. We assume that the absence of 2P and 3P especially at earlier ages is not just due to the delay of plurality, but due to the fact that there were few 2P and 3P contexts.

Gender agreement: Figures 5 and 6 show the distribution of gender forms in the data of Ibrahim and Wala produced in the imperfective and perfective contexts.

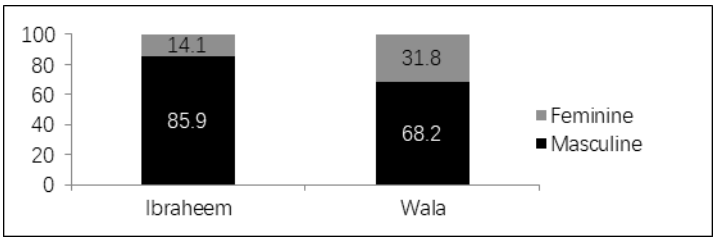

Figure 5. Distribution of gender agreement in the imperfective form

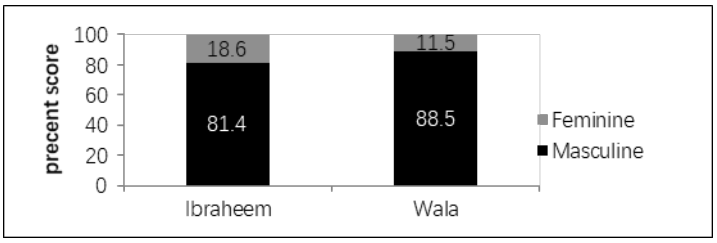

Figure 6. Distribution of gender agreement in the perfective form

As observed earlier, YIA-speaking children acquire masculine agreement forms before feminine forms in both imperfective and perfective tense.

4.5 Agreement error in child speech

Recall that in YIA, the person, number and gender in the imperfective are often separable where the prefix indicates person feature and the suffix, number and gender features. In the perfective tense the three features are realized by a single suffix. Given this fact, it was expected that agreement errors would be more in the imperfective tense than in the perfective tense. When we looked at errors, we consciously ignored minor sound changes in the morpheme so long as the morpheme could be easily retrieved from the children's pronunciation. The frequency of errors used in the present was round off to 63.33% and in the past was 36.66%. Notice that the substitution errors in the present are more than past forms and this might be due to the morphological complexity of present forms as the agreement features are represented by prefix and suffix whereas in the past they are realized by suffix morphemes only.

Therefore, all errors that were coded in the analysis pertained to the use of the correct morphemes for person, number and gender (PNG). Different types of agreement errors were found in the corpora. Table 9 shows the total number and nature of substitution errors for each agreement form for each child.

From Table 9, it can be pointed out that most of the cases represent the use of the 3SG inflection instead of other verbal suffixes: 11/19 (Ibrahim) and 30/40 (Wala). This means that 50-75% of error types were examples where children use the third person singular form instead of some other forms (mostly instead of 1S, 2MS, 3MP, 3FS, 3FP). We explain the reasons for this substitution by invoking the morphological structure of 3MS. Recall that the 3MS form in YIA has a null agreement morpheme, and therefore acts as a default form in place of other finite forms.

Table 9. Substitution agreement errors

Target	Substituted by	Ibrahim	Wala
1S	3MS	1	0

1P	1S	5	2
2MS	3MS		1
	3FS	1	
	3MP		1
3FS	3MS	7	16
	3MP		
	2MS		1
3FP	3MS	1	
	3MP	1	2
3MS	3MP	0	2
3MP	3MS	3	13
	3FS		2

Only a small proportion of these errors are errors of substitution of person suffix for another one: 1/19 (Ibrahim), 1/40 (Wala). Given below are examples of these errors from the two corpora. Most of the errors were substituted with 3MS, for 3MP (where number agreement is affected) as in (11) and (12) and 3FS (where gender agreement is affected) as in (13) and (14).

(11) Context: Asking Ibrahim about where all the family children are going along with the speaker

ʔawalli *ʔal-Hadiiqah*. (Ibrahim 2;4.13)

1.go.IMPERF.S the-park

'I will go the park.'

Target: *niwalli* *al-Hadaiqh*.

Will-go-1PP the-park

'We will go (to) the park.'

(12) Context: Asking Ibrahim about where his mother is.

dizeʔ. (Ibrahim 2;3.2)

go.PERF-3MS

'(He) went.'

Target: *gizaʕeh.*

go.PERF-3MS

'(She) went.'

(13) Context: Showing Wala a picture of boys taking a shower together.

yiʕasel. (Wala 2;6.25)

3.take.a.shower.IMPERF.MS

'He is taking a shower.'

Target: *yiGasil-u*.

3-take.a shower-IMPERF MP

'They are taking a shower.'

(14) Context: Asking Wala about where her cousin, Malkeh, is.

walliʔ *al-madrasah.* (Wala 2;6.25)

go.PERF.MS the-school

'He went to the school.'

Target: *Wallah* *ʔal-madrasah*.

go.PERF.FS the-school

'She went (to) the school.'

5. Conclusion and summary

In this research we looked at the acquisition of verb-agreement forms, (person, number, and gender) in the early speech of YIA-speaking children between 2;1-2;10 occurring in present and past contexts. What we can conclude from the analysis are the following:

(1) YIA-speaking children would use person agreement morphology productively as early as 2;1-2;2.

(2) Singular forms emerge before plural forms (in second person and third person in present forms) while masculine forms precede feminine forms and the delay in the emergence of feminine forms is between 1 month to 7 months.

(3) The feminine plural forms are delayed in both, past and present forms.

(4) Children make more number and gender errors than person errors. The majority of errors involve the substitution of plural forms with singular and feminine forms with masculine.

Generally, the results of data analysis show that YIA-speaking children use verb-agreement inflections of person, number, and gender productively as early as 2;1. This evidence has been investigated due to (a) the early emergence of person, number, and gender forms, (b) the high accuracy rate of agreement forms. The results give an evidence to Wexler's Hypothesis, Very Early Knowledge of Inflection (VEKI) which says that children know the grammatical and phonological properties of inflections in a language in the earliest stages when they enter the two-word stage. The study also supports Hoekstra and Hyams' (1995) Early Morpho-syntactic Convergence (EMC) which proposed that children acquire the specifics of inflections of the target language at an early stage.

Therefore, the accuracy number of marking verbal agreement inflections and tense forms in the data of Ibrahim and Wala support the argument in VEKI that verbal inflections are available in children's grammar in earliest stages of language acquisition.

Abbreviations

EMC	Early Morpho-syntactic Convergence
IMP	Imperative
IMPERF	Imperfective
MLU	Mean Leanghth of Utterance
MSA	Modern Satandard of Arabic
PERF	Perfective
SCH	Strong Continuity Hypothesis
VEKI	Very Early Knowledge of Inflection
YIA	Yemeni Ibbi Arabic

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