Argument omission in SignL2 acquisition by deaf learners: 

Back to the inhibition

Elena Koulidobrova

Abstract:
We examine subject omission in American Sign Language (ASL) as a second sign language (SignL2) by deaf and hard-of-hearing users of Emirati Sign Language (EmiratiSL) with variable ages of exposure to SignL1. Results indicate that during a narrative, similarly to unimodal speech bilinguals, SignL2 learners of low ASL proficiency oversupply overt subject arguments – both NPs and pronouns (IX). In this, SignL2 learners behave differently from other ASL bilinguals described in the literature. We interpret the findings as offering support to the line of research arguing that certain atypicalities in multilingual production are best explained as resulting from the interaction between linguistic and general cognitive control mechanisms – i.e. that bilinguals oversupply arguments due to processing reasons. This phenomenon is modality independent.

Keywords: null subject, sign language, deaf, narrative

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1. Introduction

Much of research on the nature of multilingual language acquisition has historically been fueled by the following questions: How autonomous are the languages? How exactly do separate grammars interact in sequential and simultaneous multilinguals? In what ways do the languages influence one another during development? More recently, the field has also explicitly focused on asking whether any additional factors play a role in multilingual language development. For instance, if cross-language interaction is possible, can it be isolated and examined independently? While the starting point in much of the older literature is ‘yes,’ the question is not trivial – other characteristics of development in general and bilingual development in particular might interfere with such examination. Among them are the roles of general integration of linguistic experience in cognition and of the linguistic modality. Concretely, because languages of a bilingual do not (co-)exist in a vacuum, we might expect various factors affecting multilingual linguistic experience to create a constellation of effects, only some of which may be visible/immediately detectible. In this vein, in various works Sorace and colleagues (see Sorace, 2016 and references therein) have argued that anaphora resolution tasks reveal complexities of integration of linguistic and executive control forces in multilingual production. The argumentation has relied on the observation that at least from the point of view of phonology, only one of the languages of a multilingual can be overtly realized in production, and all the rest must be inhibited (Kroll, Bobb, & Wodniecka, 2006, i.a.). This creates an
increased processing load, resulting in the multilinguals’ reliance on resumptive forms (Asudeh, 2004).

As one type of evidence for this, researchers have used rates of overt argument suppliance. For instance, in the early days of research on argument omission in simultaneous bilingual production, the following observation emerged: bilinguales acquiring two languages, one of which allows/forces arguments to remain null (such as Italian, Spanish, Japanese, Inuktitut, and Turkish), were originally expected to also drop arguments in their non-null argument language (e.g. English) because the property was predicted to ‘transfer’ (cf. Hulk & Müller, 2002). Yet, the opposite appears to be true – bilinguales of all ages have been shown to oversupply non-target overt pronouns in the null-argument language instead. This finding has been attested robustly with various combinations of languages (Serratrice, Sorace, & Paoli, 2004 [Italian-English]; Juan-Garau & Pérez-Vidál, 2000 [Spanish-English]; Pinto, 2006 [Italian-Dutch]; Hacohen & Schaeffer, 2007 [French-English, Hebrew-English]; Schmitz, Patuto, & Müller, 2012 [Italian-German, French-German]; Mishina-Mori, 2007 [Japanese-English]; Blais et al., 2010 [Japanese-French]; Huang, 1999 [Chinese-English]; Haznedar, 2010 [Turkish-English]; Zwanziger, Allen, & Genesee, 2005 [Inuktitut-English]), leading to the suggestion that cross-linguistic interaction must be uni-directional for some reason – the issue to which we return below. Later works, however, have argued that morpho-syntactic influence cannot possibly account for the range of the observed effects. This is because studies involving pairs of languages both of which allow/force overt arguments to remain null (e.g. Spanish-Italian, Serratrice, Sorace, Filiaci, & Baldo, 2011) have yielded the same results: bilinguales, especially
late learners, oversupply overt arguments in the manner that is non-target for either their native or additional languages – L1 and L2, respectively (Belletti, Bennati, & Sorace 2007; Sorace, 2003, 2005, 2006a, b, 2011; Sorace & Filiaci, 2006; Tsimpli & Sorace, 2006; Tsimpli, Sorace, Heycock, & Filiaci, 2004; Chamorro, Sorace, & Sturt, 2015). What bears a special note here is this: the effect is robust and covers both simultaneous (i.e. the effect is observed in both of L1s) and sequential (i.e. the effect is observed in the L2) bilinguals in various language families.

The question we ask here is whether this finding is modality dependent. The rationale for the question is this: the original sets of studies reported above involve language combinations within the same modality – all spoken. However, a number of studies on bi-modal language acquisition (e.g. English-American Sign Language (ASL), Brazilian Portuguese-Lingua de Signas Brasiliera (Libras)) have shown a few unattested linguistic patterns and behaviors (Lillo-Martin, Quadros, Koulidobrova, & Chen Pichler, 2009). For instance, research on bimodal sign-speech production has demonstrated that unlike, e.g., Spanish-English bilinguals, child and adult ASL-English bilinguals do not tend to code-switch but, rather, code-blend (Emmorey et al., 2008a; Petroj et al. 2014). Specifically, with respect to anaphora resolution tasks, relatively high rates of argument omissions as well as the types of null arguments unattested in the literature on monolingual and bilingual acquisition (Figure 1), have been recorded in the English of bilingual hearing children of deaf adults and deaf children with cochlear implants (Koulidobrova, 2013b, 2015, 2017.
Figure 1. Rates of subject omission in atypical environments (unattested in monolinguals and unimodal bilinguals) in the English of two ASL-English bilinguals (Koulidobrova, 2017a)

By the same token, unlike other young bilingual children acquiring a null argument (NA) language and English simultaneously bimodal bilingual children do not oversupply overt pronouns in their null argument language – ASL, at least in spontaneous production (Koulidobrova, 2014, 2017a), if not in an experimental condition, and not till they are older (Reynolds, 2016). Adult bimodal learners of ASL behave on par: Frederiksen & Mayberry (2015) demonstrate that the rate of argument omission in the elicited narratives of late learners of ASL whose L1 is English does not differ significantly from that of native signers in their sample. In other words, both simultaneous and sequential ASL-English bilinguals behave differently from spoken language bilinguals.

Literature offers a few potential explanations for these observations. First, it is possible that cross linguistic transfer accounts have not been explored fully. For example, languages may in fact interact with one another in the domain of argument omission, but there is just something about the previously examined language combinations that hides this transfer. The question of course is what that could be. We know, for example, that the problem cannot lie in the necessary
‘unidirectionality’ of cross-language interaction. Let us examine the reason closely (see Koulidobrova, 2012 for an extended discussion).

Tsimpli (2011) suggests that overt lexical items (e.g. personal pronouns) have a higher chance of being observed in the language of bilingual over covert ones (e.g. pro) because overt ones are the default. Tsimpli’s view can be cast in the following way: a bilingual reaches into her lexicon for an item, and when two of them are in competition, the default wins. This account offers an explanation for the robust findings from the unimodal spoken language studies; however, it also predicts that bimodal bilinguals will not omit arguments. In a similar vein, Serratrice et al. (2004) argue that the difference between overt pronouns in Italian and English lies in the constellation of features make these pronouns. Consequently, the contexts appropriate for the pronominal use – in this, the use of pronouns in Italian is much more pragmatically restricted than the use of pronouns in English, and bilinguals use the lexical item that is the least pragmatically restricted between the two. If that were the case, however, we would not be seeing the difference between unimodal and bimodal bilinguals either: ASL omits its arguments freely but this omission is tightly pragmatically constrained (Koulidobrova, 2017b).

The third type of account we could rely on has been proposed by Sorace and colleagues (see Sorace, 2016 for an overview): that in tasks involving anaphora resolution (among others), linguistic processes interact with general cognition non-trivially. Concretely, because the two languages of a unimodal bilingual cannot be produced at the same time, and bilinguals must expend cognitive effort inhibiting one of them (Kroll et al., 2006, i.a.), overt arguments surface where they don’t belong for processing reasons, allowing the bilingual to track reference better.
An explanation along these lines suggests that in a language combination where such a
competition is either not present at all or simply relaxed in some sense (Emmorey et al., 2008b,
i.a.), different patterns may arise.1 In terms of argument omission, this means that because of the
reduced processing load, bimodal bilinguals will not oversupply overt arguments when unimodal
bilinguals do – i.e. if there is any cross-linguistic interaction in the domain of argument omission
at all, and the presence of the null-argument language in the linguistic repertoire of the bilingual
affects her grammar in any way, the addition of another modality will offer a stage where this
phenomenon can be observed. We will henceforth label this explanation an executive control-
based account.

There is, of course, another possible explanation for the apparent uniqueness of bimodal
bilinguals: the fact that the other language is a sign language. In fact, atypical linguistic patterns
of sign-speech bilinguals have been previously noted in the literature on linguistic development
of hearing children of deaf adults (Todd, 1971; Schiff & Ventry, 1976; Sachs, Bard, & Johnson,
1981; Murphy & Slorach, 1983; Schiff-Myers, 1988; Johnson, Watkins, & Rice, 1992; Seal &
Hammett 1995) and deaf children with functional hearing restored via a cochlear implant
(Koulidobrova, 2013b). While the field no longer asks whether sign languages are real
languages, it remains clear that the contributions of gestural modality cannot be dismissed in
theorizing about language acquisition, especially in terms of multilingualism (see Futrell et al.,
2015 for an overview). Pushing this idea further results in a possibility that there is just

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1 In such a scenario, cross language interaction, not obscured by processing difficulties, may be visible
(Koulidobrova 2012).
something about the use of a *sign* language that affects the production of the spoken one. Let us call this type of explanation a *visual language/language-on-the-hands-based* account.

In this paper, then, we attempt to disambiguate between the last two possibilities and offer support for the *executive control-based* account, relying directly on the data from acquisition of ASL as an additional sign language (SignL2).

2. **Detour: Modality issues**

Outside of perhaps the immediately obvious difference between languages in different modalities (different articulators and articulatory space, a possibility of bimodal production and non-concatenation, etc.), comparison between sign and spoken languages is additionally complicated in the following manner. The current literature on L2 acquisition of a sign language and of any language by signers is not easily comparable to the literature on L2 acquisition of a spoken language and of any languages by speakers. Consider this: when hearing users of spoken languages learn other spoken languages, this acquisition occurs in the same modality (M1L2). However, traditionally, claims regarding sequential acquisition of sign languages are made about hearing individuals acquiring a sign language (e.g. Spanish speakers learning Catalan Sign Language (LSC) in interpreter training programs, Bell et al., 2015. This is learning of an additional language across modalities (M2L2) and involves the use of articulators typically utilized for language-specific co-speech gesture. In some sense then, M2L2 learning may
involve simultaneously less and more inhibition on the part of the learner – less because both M1L1 and M2L2 can be produced simultaneously (unlike M1L1 and M1L2), and more because the L1 gesture actually must be inhibited during L2 production. These are the challenges of examining M2L2 acquisition by hearing individuals.

Differently, claims regarding L2 acquisition by the deaf/hard-of-hearing tend to focus on learning the written version of the ambient spoken language (e.g. signers of ASL learning English literacy, Dostal & Wolbers 2016). Such learning also occurs across modalities but cannot easily be labeled M2L2, since what is being learned directly is not a natural language per se but rather literacy representing a natural language, and often a privileged variety thereof (e.g. Standard American English). Further, research has shown that at least some deaf signers code-blend at the lexical level routinely, use lexical items adapted from the local spoken language. For instance, Bank, Crasborn, & Van Hout (2018) note that 12% of the Sign Language of the Netherlands (NGT) corpus produced by the deaf signers contains non-redundant mouthings from Dutch. If this finding generalizes, it suggests that such a signer is perhaps necessarily bimodal bilingual to a degree (M2L2), despite not having full access to the other language; this makes isolating effects of each of the languages more difficult.

Finally, at least in the US, over 90% of deaf and hard of hearing children are born to hearing families, the vast majority of whom never learn how to sign. As a consequence, a sizable number of deaf children experience language delay which, in turn, has been shown to affect language learning as well as other types of learning, including literacy (Karchmer & Mitchell, 2003; Mayberry & Lock, 2003, Mayberry, 2007, i.a.). Therefore, comparing sequential
acquisition of sign languages by the hearing- or of spoken languages by the deaf- to the
acquisition of spoken languages by the hearing individuals is a problematic enterprise riddled
with confounds (Chen Pichler & Koulidobrova, 2015; Koulidobrova & Palmer, 2016). For a true
comparison then, what we need is a context in which users of some sign language (SignL1)
acquire an additional sign language (SignL2) – i.e. also an M1L2 environment. Although
literature on this particular population remains sparse, research has shown that language
interaction occurs, at least in the domains of phonology and phonotactics (Ortega & Morgan,
2010, Ortega, 2013, Chen Pichler, 2011). We therefore expect other multilingualism-related
effects to be visible as well.

3. Study goals and predictions

Recall that previous studies on argument omission in general (section 1) have shown that
unimodal and bimodal bilinguals behave differently with respect to argument suppliance in both
of their languages in both spontaneous production and in elicited environments. The difference in
recorded in Table 1 below.

<table>
<thead>
<tr>
<th>M1 (e.g. Italian/Spanish/Inuktitut - English)</th>
<th>M2 (e.g. ASL-English)</th>
</tr>
</thead>
</table>

2 Of course, even in this language combination, language delay affecting many signers remains a confound.
L2 learners in ASL narratives have shown that adults omit over 50% of arguments: Fredriksen & Mayberry (2015) cite ~55% of arguments being omitted by adult M2L2 learners and ~54% by L1 users.³ We therefore predict that if the reason for the previously recorded difference between unimodal (M1: speech) and bimodal (M2: sign-speech) bilinguals is related to the sign modality, then the SignM1L2 learners will pattern with bimodal bilingual learners (M2L2) (the right column of Table 2, (2a)). If, however, the discrepancy in Table 1 results from the differences in executive control/processing, then unimodal bilingual ASL learners will pattern on par with unimodal learners of two spoken languages, robustly represented in the bilingual literature (the left column of Table 2, (2b)), supporting the general view that unimodal bilinguals oversupply arguments not because they are default but because the forced choice into one set of articulators creates more of a processing load, resulting in a higher rate of overt arguments. In other words, unimodal bilingual ASL learners will behave differently from bimodal bilinguals.

(1) a. EmiratiSL-ASL bilinguals will not oversupply arguments in ASL

³ Frederiksen & Mayberry (2015) report much lower rates of argument omission than Wulf, Dudis, Bayley, & Lucas (2002) (the latter cites ~70%). However, this difference may be due to the use of markedly different methodologies: the former elicit using tightly controlled narratives using stimuli; the latter record ‘chit-chat’ about experiences/free discourse.
= visual language/modality account

b. EmiratiSL-ASL bilinguals will oversupply arguments in ASL

= executive control/processing account

Further, considering the specific characteristics of the deaf population (see section 2 and Figure 3), one other prediction arises: if the phenomenon under the examination is in fact linguistic in nature, participants who were exposed to SignL1 early may be expected to behave differently from those who were exposed to language late (cf. Boudreault & Mayberry, 2006 and Mayberry 2007).

4. Methodology

4.1. Participants

The target language under examination here is ASL – a null argument language which, in the relevant property, resembles Japanese (Koulidobrova, 2012, 2017b), Mandarin Chinese (Lillo-Martin, 1991), or Italian (Bahan et al., 2000), depending on the analysis. The crucial point here is that ASL allows, and often prefers, its arguments to be omitted, as in (1).⁴

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⁴ Per Sign Language research conventions, the utterance is documented using SMALL CAPS for glosses, with ‘g[…]’ indicating a gesture rather than a sign and ‘#...’ indicating a finger-spelled word.
(1)  
a. A: COOKIE SEE?

   ‘Have you seen my cookie?’

   B: (?IX1) EAT-UP (*IX3)

   ‘(I) ate (it)’

b. A: MARY HERE?

   ‘Is Mary here?’

   B: NO OUT TODAY KID SICK

   ‘No (she) is out today, her kid is sick’

The overt pronominal element is IX, uttered in form identical to the pointing gesture used by the hearing community in the US. ASL differentiates between two forms of IX – 1st and non-1st (Meier, 1990; Lillo-Martin, 1995). Both forms productively participate in anaphoric relations (Sandler & Lillo-Martin, 2006; Kouiidobrova & Lillo-Martin, 2016). This is the SignL2 for the participants of the study and, in the terms articulated in section 2 and elsewhere (cf. Chen Pichler & Kouiidobrova, 2015), their SignM1L2.

The other language of the participants (their SignL1) is Emirati Sign Language. To our knowledge, there is no literature on EmiratiSL; it appears to be related to other Arabic sign languages and, crucially, it resembles Jordanian Sign Language and Japanese when it comes to argument omission (Hendriks, 2008). In other words, like ASL, EmiratiSL is a null-argument language where something like (1) is not only grammatical but typically preferred.
The participants of the study are twelve M1L2 learners of ASL in an immersion program in the USA. This program is a part of a residential school for the Deaf that is a sign-based (vis-à-vis oral). As part of the program, all participants receive direct ASL instruction as well as academic content instruction in ASL.

Participants are male students from the United Arab Emirates (UAE) in the second year of an immersion program in ASL. Additionally, knowledge of written Arabic could be verified for 2 out of 12 participants via an open-prompt writing sample. Some of the subjects report having deaf family members and other experiences with (home-)sign discourse; others were born to hearing parents, have previously attended oral-only institutions and began acquiring their SignL1 concurrently with their SignL2. None of the subjects had any previous exposure to ASL. Details about the ages, hearing status, and age of exposure to L1 and L2 are found in Table 2.

For the purposes of this study, we isolated EmiratiSL exposure as a variable (rather than exposure to gestural/visual communication in general, for instance, which we have investigated elsewhere, see Koulidobrova & Palmer, 2016). Figure 2 shows that about half of the participants report having acquired EmiratiSL early and the other half late – i.e. there are no native signers in the sample.

5 The prompt asked students to produce anything they wished to write about in Arabic. Some topic options were (i) your family, (ii) your country, (iii) favorite holiday, (iv) personal introduction, (v) your favorite passage in the (Holy) Book, (vi) other. The rationale for the choices was as follows: with varying levels of linguistic proficiency and literacy, learners were expected to be able to produce texts on the given topics, concrete or abstract. The topic (v) was included because in the UAE (as in other parts of the world where Arabic is the dominant language and Islam the dominant religion), religious texts is an access point to literacy (Carroll, Al Kahwaji, & Litz 2017).

6 In Koulidobrova & Palmer (2016), we demonstrate that the main predictor of success on the phonological discrimination assessment for ASL as L2 is the overall length of exposure to sign modality, including home-sign systems developed within family units.

7 Complicated by the lack of literature on EmiratiSL, we could not assess participants’ proficiency. Therefore, we relied on self-reports as well as descriptions of family structure: all of our subjects who classified themselves as early learners also reported having older deaf signing siblings and other older family members. These family
Table 2. Participant information

<table>
<thead>
<tr>
<th>Age at testing</th>
<th>Hearing Status</th>
<th>Length of exposure to ASL (SignL2)</th>
<th>Age of exposure to EmiratiSL (SignL1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13;00-19;01</td>
<td>10 deaf, 2 hard of hearing</td>
<td>1-2 years (mean: 1.5 years)</td>
<td>3-19 years old (mean: 7.4 years)</td>
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<td>(mean: 15;03)</td>
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Figure 2. Age of SignL1 acquisition (AoA)

4.2 Tasks

We conducted three experiments, the goal of the first two of which was to assess the overall proficiency in ASL. We administered two instruments which have been argued in the literature to serve as valid assessments of ASL L2 proficiency for adults, although they have not (to our members may not have been native users of EmiratiSL but they served as models in language acquisition (Carrigan & Coppola, 2012).
knowledge) been used to assess ASL of M1L2 signers: a comprehension test (ASL-CT, Hauser et al., 2016) and a test of phonological discrimination (ASL-DT, Bochner et al., 2011).

ASL-CT involves matching sign clips and pictures or short videos. In ASL-DT, participants are presented with a model and a set of two sentences contrasting (or not) along some phonological parameter (orientation, location, movement, and handshape). The participants are then required to determine whether the two utterances are the same or different. For example, (2) records HEADACHE and TOOTHACHE which are articulated with the same handshape, orientation, and movement but differ in location (jaw vs. temple); see Figure 3.

Figure 3. Proficiency measure procedure

(2) Items: HEADACHE and TOOTHACHE

Model: JOE a-IX TOOTHACHE

‘Joe has a toothache’

Signer (a): JOE a-IX TOOTHACHE

[Target: same]

‘Joe has a toothache’

Signer (b): JOE a-IX HEADACHE

[Target: different]
‘Joe has a headache’

The third experiment was elicitation of narratives. The data consist of 10-15 min free discourse (~100 participant utterances) elicited as part of a familiar school field-trip debriefing: recounting the sites that were visited during the trip, retellings of the events that had occurred during the time period, among others, thus ensuring a relative consistency in vocabulary. For all subjects, the interlocutor was the participants’ regular immersion program instructor, familiar with the subjects’ linguistic patterns and skilled in eliciting responses.

4.3 Transcription and coding

All of the experimenters were native ASL users (deaf for all participants across all experiments except for 5 subjects in ASL-DT. In the latter case, the experimenter was a hearing native signer who is also an expert interpreter). The data were annotated, coded, and analyzed in ELAN (Figure 4), using conventions of sign language transcription and coding in Chen Pichler et al. (2010). There was one primary transcriber, who is deaf. The transcriber, who also had minimal training in linguistic analysis, also served as one of the coders one year after the original transcription was completed. There were two other coders, both hearing, both trained linguists; one of the two is a native user of ASL. A subset of the data was subjected to the inter-rater variability analysis between two primary coders (deaf and hearing); cases resulting in disagreement (~4% of the data) were excluded from the analysis.
All utterances containing a verb\(^8\) in a finite context were analyzed for the presence/absence of overt arguments (NPs and the pronominal \(IX\)) and their pragmatic appropriateness in a given context in adult ASL. Exact imitations as well as incomprehensible/unidentifiable strings (corresponding to the \(XXX\), and \(YYY\) in Chen Pichler et al., 2010) were excluded from the analysis.

Figure 4. Narrative: ELAN window

5. Results

In terms of the proficiency measures, scores varied (Figure 5), but all of the participants corresponded to the beginning level in Bochner et al. (2011) and Hauser et al. (2015), with the range of scores between 40-76%. Further, scores on ASL-CT and ASD-DT correlated \((r=98, p<.0001)\), as Figure 6 demonstrates.

\(^8\) Because ASL does not have an overt copula, a number of utterances that could have been potentially relevant for the analysis were excluded.
No correlation between the proficiency measures and age of acquisition, either L1 or L2 was observed ($p > .05$). Instead, the variable that predicted the success on ASL-DT was the total amount of exposure to what one might tentatively label communication in the visual modality: L1, L2, and homesigning ($R = .44$, $p < .05$).\(^9\)

Results of the narrative task are shown in Figure 7, where the $x$-axis represents individual participants (A1-12) with the age of L1 acquisition coded (L1 early or late), and the $y$-axis represents subject suppliance in the utterances containing finite verb contexts (‘VU’). Overall, performance in terms of overt subject suppliance was variable; however, for all but one participants, the majority of subjects were overt. In terms of overt arguments, both NPs and pronominal expressions ($IX(1)$ and $IX(non-1)$ in Figure 7) were robustly represented.

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\(^9\) See Koulidobrova & Palmer (under review) for an extended set of findings and discussion.
Figure 7. Subject suppliance in the narrative in utterances containing verbs ('VU'). ‘IX’ is commonly analyzed as a pronoun referring to the 1st (as in IX(1)) or 2nd/3rd persons (as in IX(non-1)). ‘NP’ represents overt Noun Phrases, and ‘Null’ – omissions/zero anaphor.

For each participant, 30-50% of overt subjects were pragmatically inappropriate, the majority of which (69-80%) were pronominal – IX. Sample utterances are recorded in (3)-(5).

The italicized bolded items in both the utterances and the translations reflect inappropriate, from the point of view of a native deaf signer, use of overt subjects; parentheses in the translation indicate omitted subjects.

(3) WALK AROUND TAP-ON-SHOULDER g[COME-ON] GO DOWN LINE IX(1)
CURIOUS IX(1) IX(1) THINK FINE WATER BOTTLE g [HOLD-BOTTLE] TELL
IX(1) NO WATER OUT MUST IX(1) LOOK g[CONFUSED-FACE] IX(1) THINK #OK
g[OPEN-BOTTLE] DRINK FINISH g[THROW-AWAY] IX(1) SEE
‘(I) was walking around, (this other person) got my attention, ‘Come on, go on down the line’. I was curious, I thought ‘Fine’ (with) water bottle. (Another person) tells me there is no water. I look. (I) am confused. I think it’s ok, (I) open the bottle, try drinking, but there is nothing there, so (I) throw it away. I saw this…’ 

(Subject A1)

(4)  DIE IX(3) IX(1) LOOK TOUCH RESPECT g(QUIET) FEEL DV(HAND-ON-CHEST) GOOD IX(3) HELP IX(3) PEOPLE PRESIDENT IX(3) IX(1) LOOK STILL FIRE

‘(They) died. I looked around, touched with respect. (I) feel good. They helped, and they are regular people and president. I look around and see the fire still burning [=eternal flame].’

(Subject A6)

(5)  WOW HISTORY IX(1) LOVE WANT MORE WOW NEVER IX(1) SEE BEFORE HERE NOW IX(1) TIME WOW GUIDE GOOD NS(P) IX(2) HELP LOOK EXPERIENCE

‘This was quite a history. I loved this and wanted more. I have never seen anything like this before. I had quite a time. ‘P’ (=name sign) is a great guide. You help see and [you have?] experience.’

(Subject A12)

Of note is the fact that in (3)-(5), a number of the inappropriate (according to the native signer) overt subjects are 1st person – something that, to our knowledge remains unattested/not discussed in the literature but appears robustly present in the SignL2 of these learners (see Figure
Hierarchical regression revealed that the rates of overt 1st person pronoun \((IX(1))\) predicted the results on ASL-DT \((R=0.074, p=0.02)\). No other effects were observed, including any of the effects of age of L1 exposure: as seen in Figure 7, subjects A1-7 report being exposed to EmiratiSL before the age of 5; A8-12 are late acquirers, and one is acquiring L1 and L2 simultaneously. The age of language acquisition did not predict the difference in overall subject suppliance \((t=0.08, df=9.56, p=0.47)\), or suppliance of overt pronominal expressions \(IX\) \((t=0.14, df=8.7, p=0.45)\) in general or the 1st person \((IX(1))\) in particular \((t=0.54, df=6.37, p=0.33)\).

To summarize the results: M1L2 learners of ASL, while performing on par with beginner M2L2 learners in terms of proficiency, nevertheless behaved differently from them with respect to argument omission, at least when it comes to the subject of the clause. For ease of comparison, see Table 3. Due to the difference in the methodologies, no statistical analyses could be applied here; however, the data themselves are telling: M1L2 signers, whose L1 also allows argument omission, supply overt subjects with much greater frequency than M2L2 and L1 users of ASL.

**Table 3. Subject omission results: means**

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<tbody>
<tr>
<td>30-43%</td>
<td>~55%</td>
<td>~53%</td>
<td>~70%</td>
</tr>
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</table>

In the narrative task, our subjects utilized all three types of reference cohesion strategies. That is, they omitted arguments, as required by the grammar of ASL (see (1)); they supplied
overt NPs, like PEOPLE and PRESIDENT (see (4)), and they also supplied overt 1\textsuperscript{st} and non-1\textsuperscript{st} person pronominal forms I\textsubscript{X} (see (2)-(3)). Further, Frederiksen & Mayberry (2015) report that in both their M2L2 and L1 ASL data, pronominal expressions constitute a true minority of overt arguments (less than 1%). However, for M1L2 signers in this study, this number is much higher, ranging between 10\% and 65\%. In other words, despite the difference in methodologies, we can be reasonably sure that M1L2 ASL learner results differ considerably from those of L1 and M2L2 ASL signers.

6. Discussion

We hesitate to make a direct comparison with the previous research on reference cohesion since the methodologies differ. However, in terms of the qualitative analysis, everything about the SignL2 performance on the narrative task appears different from the L1 and M2L2 studies: rates, distribution across types of referential expressions, and their appropriateness from the point of view of the target grammar. In brief, L1 users of EmiratiSL who have been learning ASL as L2 are behaving in parallel with Spanish-Italian bilinguals in Sorace, Serratrice, Filiaci, & Baldo (2009) – both of their languages allow argument omission but the learners are oversupplying overt arguments their L2 –– in their weaker language.

Let us then return to the original set of questions we set out in sections 1-2. A robust finding in the literature on bilingual (simultaneous and sequential) acquisition of spoken languages that
allow their subjects to remain null is that bilinguals perform in a non-target manner here, often oversupplying overt forms where the null ones are more acceptable. However, albeit limited, the data from bimodal bilingual language production (both child and adult) have shown the opposite. In (3), repeated here as (6), we articulated predictions for two types of accounts that might capture the difference in performance between unimodal spoken and bimodal bilinguals in terms of argument oversuppliance effects.

(6) a. EmiratiSL-ASL bilinguals will not oversupply arguments in ASL = modality account
   b. EmiratiSL-ASL bilinguals will oversupply arguments in ASL = processing account

That is, if the reason for the apparent uniqueness of bimodal behavior lies in the sign modality itself, then the SignL2 users of ASL in this study should have behaved on par with other populations whose other language is ASL: the rates of argument omission ought to have been high, matching the previously reported numbers for L1 and M2L2 learners. This, however, is not what the data reveal: instead, SignL2 learners of ASL, whose SignL1 – EmiratiSL – matches the SignL2 in the relevant morpho-syntactic property, exhibit a lower rate of argument omission. We interpret this finding as suggesting that the account a la Sorace (2016) carries a better explanatory value than the alternative: because in the case of SignL2, one of the languages must be inhibited (as is the case in a unimodal spoken language combination but not the bimodal one), this creates more cognitive pressure and learners resort to overt forms for reference tracking.

This conclusion directly implies that overt forms being observed in the languages of unimodal
speech bilinguals may have nothing to do with L1-L2 interaction (or lack thereof); rather, it is a bilingual phenomenon, masking the potential language interaction in the domain of argument omission. This is precisely the path pursued in Koulidobrova (2017a) in explaining the increased rates of null arguments in the speech of bimodal bilinguals (see Figures 1). For this study, then, we can now say that the oversuppliance of $I_X$ and overt NPs in the SignL2 learners’ ASL may have nothing to do with cross-linguistic interaction either. Thus, while the distribution of $I_X$ in EmiratiSL should be examined independently, we cannot simply attribute its presence in the L2 ASL of the Emirati signers to transfer.\textsuperscript{10}

There is another, albeit indirect, piece of evidence in favor of the view that the oversuppliance rates/patterns are not (cross-)linguistically-based. We know that age of acquisition of L1 affects linguistic competence and performance (section 2): late L1 learners tend to perform differently in terms of bona fide linguistic tasks when compared to the native and early learners. However, no effect of the age of L1 acquisition was observed in this study. Certainly, numbers are small here: overall, the Early Learner group (subjects A1-7) omitted more subjects than the Later Learner group; however, the effect was not significant. Perhaps with a larger set we might see more here. No effect of L2 acquisition (such as age at arrival or length of study) was observed either.

7. Limitations and directions

\textsuperscript{10} The question of whether unimodal speech bilinguals oversupply 1\textsuperscript{st} person pronouns remains, however.
The claims advanced here remain preliminary, and the data represent only the first step in the examination of the linguistic processes by SignL2 learners; yet, the results of the study shed light on a number of important issues which deserve attention. First, the fact that the results of the two proficiency measures strongly correlated offers some evidence that the two instruments, which, to our knowledge, were not normed on SignL2 population, actually appear to serve as valid measures of ASL as SignL2, at least with this small sample. Second, with respect to the phenomenon under examination here, for example, what has not yet been articulated is how the SignM1L2 learners compare to their speech M1L2 and M2L2 counterparts in terms of the use of referential expressions as a cohesion tool in various discourse functions (introduced, maintained, re-introduced). More generally, the participant pool here was small with a fairly high degree of variability; it remains to be seen whether the generalization that has arisen here survives a larger N-size. Additionally, to date, very little is known about SignM1L2 processes in terms of either language interaction or extra-linguistic factors (Chen Pichler & Koulidobrova, 2015). To our knowledge, no research has been done on the morpho-syntax of EmiratiSL either. There are also, of course, other potential variables at play, such as language disabilities outside of audition that are typically not identified for the vast majority of the deaf in the world, including the participants of this study. The latter, for instance, adds an additional prediction stemming from the account advocated here: individuals with executive control-related atypicalities may be expected to present higher rates of argument suppliance.
A direct finding in this study that also deserves careful examination with a larger sample is that while the participants’ scores varied widely, their performance was predicted by the amount practice with the visual modality – exposure to homesigning family members, for example. In other words, relative success on the proficiency measure in SignL2 depended not on the age of acquisition of this L2 (as is typically found in the L2 literature) or the age of acquisition of the L1 (as is typically found in the SignL1 literature) but the amount of practice in the visuo-gestural modality. This finding has thus far been unattested, to our knowledge, and can arguably be only be explored in multilingual singing populations.

Finally, note that the participants in this study are also exposed to English in print, being explicitly taught it as part of the academic content. What the effects of the L3 acquisition here are, and what influences the development of foreign language learning for the deaf and hard of hearing (SignL2) vs. mastering literacy in representing the spoken language of the country where that SignL2 is used remains to be determined. These and other potential questions we leave for future research.

References


