

**Against all expectations:
Encoding subjects and objects in a new language***

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Introduction

All good linguistic field workers bring to their task two sets of perfectly reasonable contradictory expectations. On the one hand, in true Boasian tradition, they have trained themselves to be open-minded and not to impose preconceptions on the data. On the other, in more modern Chomskyan fashion, they know that description cannot be done in the absence of a theory and that the more articulated their theory the deeper the questions they can ask. The sign languages of the world that have been well studied resemble each other much more closely than do spoken languages that are unrelated to one another. Elsewhere (Aronoff, Meir, Padden, & Sandler, 2004; Aronoff, Meir, & Sandler, 2005) we have argued that the newness of individual sign languages and the visual medium through which they are transmitted together make unrelated sign languages more similar to one another than spoken languages are. This means that sign language researchers, on first encounter with a language, come armed with fairly strong expectations.

The language that our group has been working on for the last several years was completely undescribed and unrecorded before we began our research. All that we knew when we first entered the Al-Sayyid Bedouin village was that a sign language was in use in the community (Scott et al., 1995). We knew that, although the language was only in its third generation, it was so widely used among both deaf and hearing members of the community that it was viewed simply as a second language of the Al-Sayyid village (Kisch, 2004). We subsequently determined that it fully met the communicative needs of its users, was autochthonous, and different in structure and

lexicon from surrounding spoken and sign languages (Sandler, Meir, Padden, & Aronoff, 2005).

Our previous work as a group on the morphological systems of other sign languages had dealt with verb agreement and classifier systems (Aronoff, Meir, Padden, & Sandler, 2003). These two types of morphological systems are both very similar across all sign languages and very different in sign languages from their counterparts in spoken languages; in other words, they are morphological hallmarks of sign languages. We accordingly set out to focus on just these systems in Al-Sayyid Bedouin Sign Language (henceforth ABSL), expecting quite naively that ABSL, if it had any structure, would have these two systems. Very quickly, though, we learned that the language of the second generation of ABSL users, the group that we have studied most closely, has no verb agreement and very few classifiers, indeed almost no morphology (Aronoff, Meir, Padden, & Sandler, 2004).

Instead, we found robust structure in an area where we had not thought to look initially, because it was not an area where previous research had revealed properties that were especially characteristic of sign languages: word or constituent order within clauses. As reported previously (Sandler, Meir, Padden, & Aronoff, 2005), ABSL has very robust and regular word order, a fact that is of interest not simply because ABSL is a sign language, but also because it is a new language. In this paper, we refine our earlier findings and respond to a suggestion that several colleagues have made about them: that the word order regularities we observed may not be syntactic, but rather discourse-driven.¹ We also return to the question of the status of nominals in these structures, whether they are in fact subjects and objects or more appropriately labeled as semantic or

discourse roles such as agent, patient, topic, background or foreground.

We will show first that the system of verbs in ABSL provides evidence for syntactic categories in the language, specifically the categories of subject and object. We will then show that there are order effects at the discourse level, but that these can be quite neatly distinguished from the syntactically-based order, so much so that the discourse effects actually provide additional evidence for our original syntactic claim.

Method

Subjects

We have identified three generations of signers. Deafness appeared in the community in the fifth generation after the community was founded. In that generation, there were fewer than ten deaf individuals, all of whom are now deceased. Apart from reports that they did sign, and one very short videotape record of one of these individuals, information about their language is limited. We report here on nine signers of the second generation, eight deaf and one hearing, all currently in their thirties and forties, except one in her twenties. The third generation of signers, ranging from teenagers to young children, is not included here.

Data elicitation and analysis

All research was conducted in signers' homes in the village. For all elicitation tasks, the signer addressed another signing member of the community, to ensure that their language was produced in a communicative context to a competent user of ABSL.

Signers provided spontaneous narratives in response to a request to recount a personal experience, and they described short video clips created to elicit descriptions of single

events portrayed by actors.² All responses to these tasks were videotaped and transcribed, and comprise our corpus.³ The transcriptions consist of glosses for each individually identifiable sign production. The narratives were translated into Hebrew by a trilingual hearing signer and subsequently into English by the authors.

Signs were assigned to constituents according to both semantic and prosodic criteria. The utterances were divided into sentences based on signs for actions or events, each of which was classified as the predicate nucleus of a sentence. We classified other signs as noun arguments, adjectives, numerals, and negative markers, based on their meanings. Subjects (S), objects (O), and indirect objects (IO) were identified depending on their semantic roles in a clause and the standard mapping of these roles onto syntactic functions.

Constituency was further determined by careful observation of prosodic cues. Major breaks in the utterance were identified by shifts in the rhythm marked by a pause or lowering of the hands, together with a change in head or body position and facial expression. These same prosodic cues to major constituent breaks occur in Israeli Sign Language (henceforth ISL) (Nespor & Sandler, 1999), and we have observed them in other sign languages as well. Examples of the way in which we applied these prosodic criteria in our analysis of ABSL are provided below.

Semantic criteria alone allowed us to provide an unambiguous syntactic parse for most sentences. But some could only be parsed correctly by attending to prosodic criteria and comparing them with the translation that our consultant provided independently. One signer, for example, describing his personal history, produced the following

string: MONEY COLLECT BUILD WALLS DOORS. The first prosodic constituent is MONEY COLLECT. Like the majority of sentences in our data, it is unambiguous: semantics, prosodic criteria (described below), and the consultant's translation, 'I saved money,' confirm that it is an OV sentence. It is the sequence BUILD WALLS DOORS that fully illustrates our methodology. The semantics indicates that WALLS and DOORS are patients, related to the verb BUILD. In principle, then, this sequence could be an example of a VO string, contrary to the pattern we have found generally in the language. However, the prosodic analysis indicates otherwise, and that analysis was confirmed by the consultant's translation, as we now demonstrate.

In our analysis, we applied criteria for determining prosodic constituency developed in a study on ISL (Nespor & Sandler, 1999), which depends on the observation that prosodic constituency, especially that of major constituents, is largely correlated with syntactic constituency in spoken languages (Nespor & Vogel, 1986). In the Nespor and Sandler study on ISL, major prosodic breaks (intonational phrases) were systematically marked by a combination of manual and nonmanual phonetic cues. Three distinct manual cues were found to mark prosodic breaks: (a) holding the hands in place, (b) pause and relaxation of the hands, or (c) repeating the final sign in the constituent. Nonmanual cues at the intonational phrase boundary included both (a) a clear change in head or body position, and (b) a concomitant change in facial expression, the latter interpreted by the researchers as sign language intonation (see also (Sandler, 1999; Sandler & Lillo-Martin, 2005; Sandler & Lillo-Martin, 2006)). Eyeblick also correlates reliably with intonational phrase boundaries in ASL (Baker & Padden, 1978; Wilbur, 1994) and in ISL (Nespor & Sandler, 1999). These breaks separate major prosodic/syntactic constituents, such as

topics, extraposed elements, and nonrestrictive relative clauses, from the rest of the sentence, and they separate sentences from one another. Just as phrase final lengthening and intonation excursions characterize Intonational Phrase boundaries across spoken languages generally, we proceeded on the assumption that the main cues associated with IP boundaries in other sign languages would help us in our analysis of ABSL as well.

The analysis of the string BUILD WALLS DOORS proceeds as follows (Sandler, Meir, Padden, & Aronoff, 2005). In this string, the nominals are semantically related to the verb; they are patients. Syntactically, however, the nominals could either be objects of the verb in the same sentence, i.e., *I built walls, doors....*, or, alternatively, they could be in a separate fragment, conveying a list – *I built. Walls, doors....*, -- on a par with *I began to eat/I ate. Chicken, pickles, corn...* Under the first interpretation, we have (S)VO order in a single syntactic unit. In the latter, we do not. Instead, the first sentence is just BUILD, and the last major prosodic constituent is the fragment WALLS, DOORS. Our prosodic criteria clearly selected the second structure. The break between BUILD and WALLS is characterized by holding the hands in position at the end of BUILD, and then moving the body first forward, then up, and enumerating the things being built, WALLS and DOORS. In addition to changes in manual rhythm, body posture and facial expression also changed at the boundary between BUILD and WALLS. The latter two are particularly reliable markers of intonational phrase boundaries in the ISL study. The facial articulation on BUILD was a contraction of the lower eyelid (Action Unit 7 in Ekman & Friesen's Facial Action Coding System (Ekman & Friesen, 1978). At the boundary between BUILD and WALLS, when the body posture changed by moving forward and up, the lower eyelid contraction changed to neutral, and the eye gaze also

shifted, making eye contact with the addressee. That is, manual and nonmanual prosodic cues indicated clearly that the words WALLS and DOORS were not in the same major constituent as BUILD, and the string is parsed as [V]. [Noun, Noun]. Crucially, the prosodic analysis shows that it would be erroneous to parse this string as a [VO, O] sentence in which WALLS and DOORS are the objects of BUILD in the same clause. Our analysis, that the string represents a sentence consisting of a verb followed by a list fragment, was confirmed by our third criterion, translation. The spontaneous audio-recorded translation of the string by the consultant on the project was as follows: *'I saved some money. I started to build a house. Walls, doors....'*

We describe our analysis of this string in considerable detail because it is instructive due to the potential ambiguity and the atypical word order of one possible interpretation. However, the vast majority of sentences in our data that included objects were unambiguous, and straightforwardly (S)OV. We compile and discuss these findings in detail later on, where we also further expand the relation between clause structure and prosody in our data.

Results: Verb types in ABSL and other sign languages

In order to present our findings for ABSL, a brief discussion of verb types in American Sign Language (ASL) and other well-studied sign languages will be instructive. In ASL, verbs divide into three major classes: spatial, agreement and plain (Padden, 1988). The same general type of system is found in nearly every sign language described in any detail to date (Sandler & Lillo-Martin, 2006). Spatial verbs are those that incorporate fine distinctions of location and movement throughout the signing space, e.g. DRIVE-TO

and MOVE. In such signs, the movement begins at some location and ends at a different location, depicting the direction of motion of an entity.⁴

Verbs of the second category, agreement verbs, also involve path movement. But unlike spatial verbs, agreement verbs do not depict motion or location; instead they depict *transfer* from one entity to another (Meier, Cormier, & Quinto-Pozos, 2002; Meir, 1998, 2002). In ASL verbs like GIVE, SHOW, TELL, INFORM, AWARD, and SEND, the path movement is from the location of subject to object. In a subclass of verbs like BORROW, INVITE, COPY and RECEIVE, the path movement is *opposite*, from object to subject. Because the subject is the recipient and not the instigator of the transfer, these verbs are termed “backwards verbs.” Meir’s analysis (1998; 2002) describes the path movement of agreement verbs as from source to goal, capturing the direction of movement in both regular and backwards verbs.

In agreement verbs, a locus on or near the region of the signer’s chest marks first person. Any other locus around the body marks non-first person, including second and third person (Meier, 1990). Second person is typically directly opposite first person, with third person occupying all other spaces. Importantly, agreement verbs do not mark location, thus a locus on or near the signer’s body does not mean ‘near where I am,’ but first person. There is no contrast between a locus slightly lower or slightly higher on the chest region where first person is marked. Likewise, there is no contrast in location slightly lower or slightly higher in the direction of non-first person. However, in spatial verbs, loci in the signing space are finely distinctive, where slight differences in locus may be used to encode a change in location. In agreement verbs, loci are categorical for person and number.

A third class of verbs, plain verbs, is so named because these verbs do not mark location, position, person or number. Many of these verbs involve cognitive, emotive or experiencer states, as in the ASL plain verbs: THINK, LIKE, DRINK, CELEBRATE, and SUFFER. In these signs, differences in loci of the body and the signing space are only used for lexical contrast. We may treat plain verbs as a default category: a verb that does not fall into either of the other two categories, usually for semantic reasons, will be a plain verb.

The fact that many sign languages exhibit the same tripartite pattern suggests that this type of semantic organization may be general to sign languages because they have the potential for representing path, motion, and location (Meier, Cormier, & Quinto-Pozos, 2002). Indeed, when we began to collect data on verbs in ABSL, we expected to see all three types of verbs represented in the language. However, ABSL did not conform to our expectations.

Verb types in ABSL

To our surprise, instead of a tripartite division, we found a bipartite division in ABSL between verbs that depict motion and location and all other verbs. In other words, ABSL appears to have only the equivalent of two categories of verbs: spatial verbs and plain verbs. Verbs like GIVE and THROW, which semantically involve transfer from one entity to another and are typically agreement verbs in other sign languages, pattern like plain verbs in ABSL: they lack the fine locational distinctions seen in verb forms used to mark motion and location and they lack person marking as well. Instead, verbs that depict transfer from the subject to the object in ABSL involve movement from the center of the

body outward, regardless of whether the subject is first person or non-first person. For example, in the sentence MAN APPLE GIVE (‘The man gave an apple’), the signer notes the subject, MAN, then the object, APPLE, followed by GIVE in a short path movement extending outward from the body.

The form of ‘backwards’ verbs in ABSL, where the subject is not the source, but the goal of the transfer, e.g. CATCH, further supports the claim that the body marks subject but not first person in ABSL transfer verbs (and indeed generally in ABSL). In sentences with verbs like CATCH, the center movement is reversed and moves inward toward the body. This is true even when the subject is not first person, since the subject, represented by the body, is the semantic recipient. Most importantly, the system of verbs in ABSL provides evidence for the centrality of the notion subject in the language.

We now present an analysis of ABSL data to support our conclusion. ABSL signers were shown a set of 45 short video clips which depict a range of transitive and intransitive verbs across different semantic categories. From these we identified a subset of 11 as involving actions of transfer between two entities: GIVE, THROW, CATCH, TAKE, and FEED. We then analyzed a group of nine signers’ responses to these 11 elicitation clips, resulting in a total of 110 transfer forms produced by second-generation ABSL signers (which include repetitions and descriptions of single events with two clauses).⁵

Of the 110 transfer forms produced, 98 involved movement with respect to the body: center-out movement when the subject is the source (as in GIVE, THROW and FEED), or center-in if the subject is the goal (as in the backwards verbs TAKE and CATCH). There was little or no shifting of the movement to the side; instead the

movement was either center-out or center-in. The center-out/in movement appeared despite the fact that the action clips showed the actors as transferring an object from one side of the screen to the other. Signers did not mimic the direction of motion in the action clip; instead they used movement along their own central plane. Figure 1 below shows an action clip in which a woman gives a ball to a man. In her response, the signer indicates that the woman is to her right on the screen, and the man to her left, but her verb form did not make use of either of these locations; instead the movement of the verb GIVE was center-out. The signer's response is shown in Figure 2 below.



Figure 1. Woman gives ball to man.



STAND-right

STAND-left

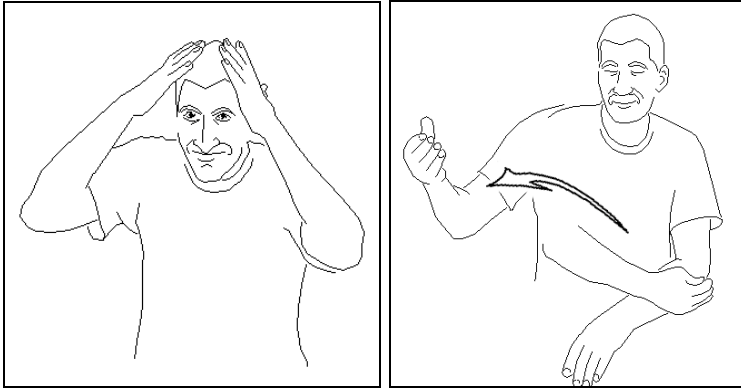
GIVE

Figure 2. ‘He’s standing here; she’s standing there. She gave (the ball) to him.’⁶

In a smaller number of responses (12 of 110), signers used a form with path movement not from the body, but from one side to the other. On closer analysis, we noticed that these involved holding or manipulating an object and moving it to another location. For example, five of these responses came from an action clip in which a man picks up a scarf lying on the floor and moves it in front of the woman who then accepts the scarf. This action is less like one of transfer than of picking up the scarf from its initial position on the floor and moving it to the woman’s location. The scarf was not initially in the possession of the man, but on the floor in front of him. We analyze these verb productions as spatial verbs, since they conform to those produced by the same signers in response to action clips in which an object is moving through space with no transfer involved.



Figure 3. Man moves scarf to woman.



SCARF

GIVE

Figure 4. ‘There’s a scarf; he handed (it) over (to her) (left to right).’

With respect to ABSL signers’ use of center-out/in movement in verbs of transfer, we conclude that their verb forms do not mark person. That is, signers did not vary the direction of the verb form when the person of the subject and object of the clause varied. The data show that using direction of path movement to depict person agreement as well as spatial motion is not common to all sign languages. ABSL exploits location and movement only for one class of verbs, those denoting motion in space. Verbs that involve transfer from one entity to another behave like the default class of plain verbs.

The generalization that unites ABSL plain verbs and verbs of transfer is that the body represents the subject argument. The body is the origin, the source and goal, and the location of the verb form itself. In all of these verbs, the body represents one particular argument participating in the event. It represents the agent in the verbs TALK and GIVE, patient in FALL-DOWN, experiencer in CRY, and recipient in CATCH and TAKE. In other words, the argument represented by the body can bear different thematic roles, depending on the particular verb. Instead of listing a variety of semantic roles that behave

alike with respect to these verb forms, the notion of subject is general to all.

Furthermore, the generalization expresses the fact that when there is both agent and patient in the clause as in PUSH, the body always represents the argument bearing the higher-ranking role, the subject. Non-spatial verbs in ABSL, then, can be characterized as a class of verbs for which the body represents subject (for a more comprehensive discussion, see Meir, Padden, Aronoff & Sandler (in preparation)).

We conclude that ABSL has two types of verbs that are comparable to the spatial and plain types in other sign languages. We also conclude that ABSL lacks person as a morphological category. Using evidence from generational change and child language acquisition in sign languages, Meier (2002) has hypothesized that the direction of change is toward increased use of space for verb agreement. Whether ABSL will develop person as an additional category at some point in the future is an open question.

Word order in ABSL

In previous work (Sandler, Meir, Padden, & Aronoff, 2005), we showed that ABSL developed fixed SOV word order within the span of one generation. Our corpus consisted of data from eight signers of the second generation, seven deaf and one hearing. In the current study, we expanded our data, by videotaping more signers of that generation, and by using additional elicitation material. The new material we created consists of 30 video clips, each depicting a single event. There are 6 types of events, defined by the number and type of arguments involved: 1 inanimate argument, 1 human argument, 2 arguments – 1 human and 1 inanimate, 2 human arguments, 3 arguments (2 human, 1 inanimate) and an event containing a spatial argument (location or path).⁷

Four signers of the second generation were videotaped describing the actions in this set of video clips (three female and one male). The female signers are all sisters. Two are in their forties, and have had only negligible exposure to other spoken languages. The third is much younger (in her late twenties), had 12 years of school, has some knowledge of the spoken Arabic dialect used in the village, and reads and writes Hebrew. The male signer is in his late thirties, and, like the two older sisters, does not know Arabic or Hebrew.

Evidence for clauses

One of the challenges in analyzing a new language is to provide evidence for clauses. We have previously offered an argument for constituency based on prosodic evidence.

Underlying our claim that ABSL has SOV word order is the assumption that the language has clauses; that is, that the signing sequence can be divided into units that are syntactic in nature, rather than rooted in semantic roles or the exigencies of conversation. Let us illustrate this problem. A sequence of signs such as MAN GIRL THROW can be interpreted as a clause containing a subject, an (indirect) object and a verb (SOV). We identify subjects as the arguments with the highest-ranking semantic role in the clause; objects are identified as the arguments with the lower ranking semantic role; indirect objects are identified as the (non-agentive) recipient arguments in clauses denoting an event of transfer. Why not refer to semantic roles directly, especially in a new language with simple syntax?

In our data, we find that the highest-ranking semantic role will function as subject, regardless of what role that is, while the next-highest will function as object. Hence, word

order generalizations that are expressed in syntactic terms are lost when we use semantic terms directly. For example, in one-argument clauses in ABSL, the sole argument shows a uniform behavior with respect to word order, that is, it appears before the verb, irrespective of its semantic role. Subjects can be agents as in FEED, TAP, PUSH, TEAR, RUN, patients in FALL, CRY, ROLL, recipients in CATCH, TAKE; or experiencer in SEE, BE-ANGRY. Similarly, the object can have one of several semantic roles: patients in TEAR, PUSH, PUT, DRAG, recipients in FEED, THROW(-TO); themes in LOOK-AT; or locatives in TAP. In addition, as shown above, the role of the body in the form of verbs in the language can only be captured by referring to the notion of 'subject'. As we pointed out above, the body in plain verbs does not represent first person, but rather the highest ranking semantic role participating in the event, that is, the subject argument.

Alternatively, word order in ABSL might be interpreted as driven by discourse, introducing one argument, then another, and then signing the predicate that relates the two arguments. In the latter analysis, one might argue that the structure of the sequence is: Topic, Topic, Predicate. If that interpretation is correct, then the claim that the signs constitute one syntactic unit cannot be maintained.

What kind of evidence can be used to distinguish between the syntactic and discourse-based analyses? Semantic criteria are of no help; the fact that three signs are semantically related does not necessarily indicate that this relationship is syntactic. Markers of syntactic dependencies, such as case markers or agreement morphemes have not been attested in the language so far; moreover, they are predicted not to occur in a new language, since the development of inflectional morphology takes time (Aronoff, Meir, Padden, & Sandler, 2004).

As we showed above for the sequence BUILD WALLS DOORS, one point of entry into the structure of the language and whether it is syntactically driven, is prosody. We use prosodic cues to determine whether or not a stretch of semantically related signs forms a clause: a stretch of signs is analyzed as a clause only if the signs form one major prosodic unit.⁸ To illustrate our method further, consider two responses to a clip showing a woman giving a shirt to a man. One subject signed the following sequence:

GIRL INDEX

BOY

GIVE SHIRT GIVE

This stretch of discourse consists of three prosodic units, marked by major breaks in the signing, of the kind described earlier. For this reason, we do not regard the string as a single clause with S IO V O V order, but rather as three separate discourse units or clauses, more or less equivalent to: “There’s a girl there, and there’s a boy, and an action of giving a shirt occurs”. Only the last prosodic unit, GIVE SHIRT GIVE, contains both a noun and a (repeated) verb. It is analyzed as VOV.


A second signer responded to the same clip as follows:

MAN STAND-HERE

WOMAN SHIRT GIVE

MAN TAKE

This sequence also comprises three prosodic units. The first unit consists of two signs,

MAN and a  hand-shape in neutral space, localizing the man ('A man standing

here'). The second unit consists of three signs signed with no prosodic break between them, analyzed as one clause with SOV word order. The third unit consists of two signs, and is analyzed as an SV sequence.

Results. The data were segmented into prosodic units by researchers of our team independently and by the whole team together. For word order purposes, we included only those prosodic units that consist of at least two signs, where one is a noun and the other a verb. Out of 287 prosodic units, 150 units consisted of at least a noun sign and a verb sign, and consequently were regarded as clauses.⁹ The following graph shows the count for each word order type:¹⁰

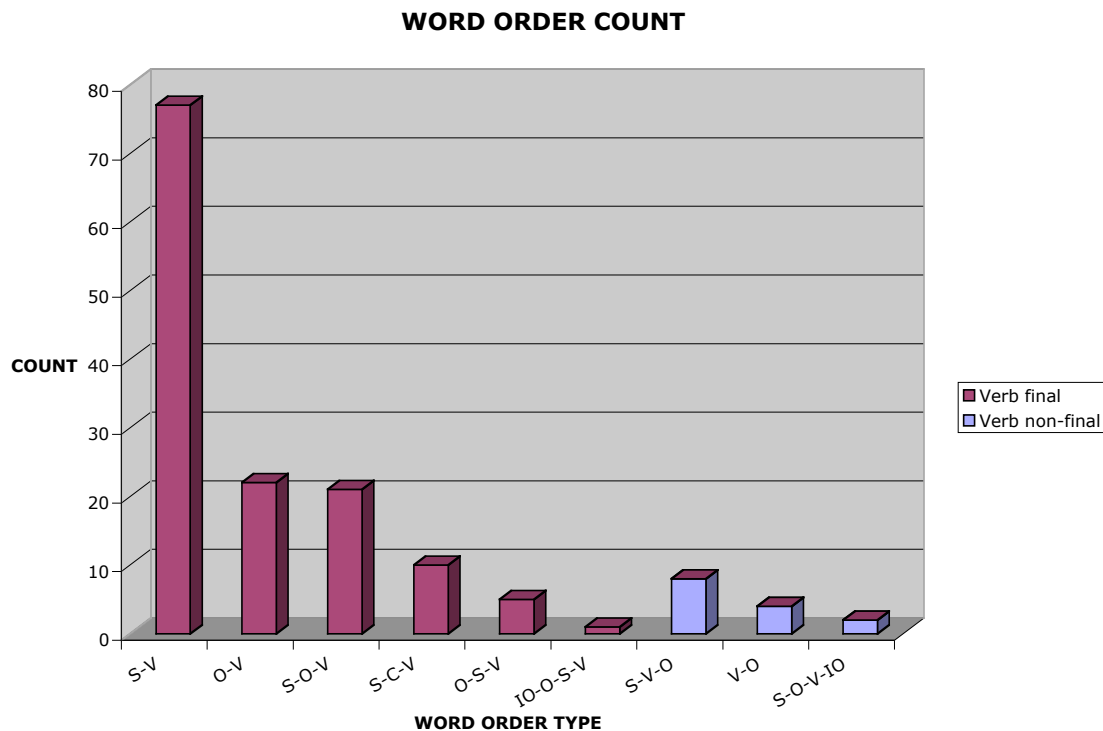


Table 1. Frequency of clauses by word order type.

These results support our earlier findings: word order in second generation signers is

predominantly verb final. Out of 150 clauses, 136 are verb final. In transitive clauses, containing both an S and an O, we find that SOV is the predominant word order, supporting our earlier findings.

Seven of the eight SVO clauses were signed by the younger signer. As we discuss below, this signer has different word order than other second generation signers, perhaps because she is influenced by her knowledge of the local Arabic dialect and Hebrew, whose basic word order is indeed SVO. As for the five OSV clauses, the addressee did not understand the signer for three of them, and the signer responded by reverting to standard SOV order.

Another observation about the syntactic structure of ABSL is the signers' tendency to prefer single-argument clauses. Eighteen of the 30 video clips show events that involve two or more participants. Thus in principle we would have expected to get 72 two- or three-argument clauses in response to those clips. However, out of the 208 clauses describing the 18 transitive events, 98 contained one argument, and only 44 contained two or three arguments.¹¹ ABSL signers do not often use two-argument clauses, especially when both arguments are human. In such cases, they tend to break the event into two clauses, with two verb signs, each predicated of a different argument. Thus, an event in which a girl feeds a woman may be described as: WOMAN SIT; GIRL FEED. An event in which a man throws a ball to a girl can be rendered as: GIRL STAND; MAN BALL THROW; GIRL CATCH.¹² This tendency is characteristic of all signers, though there are certain differences among them, to which we turn now.

Differences among signers. There are clear differences among the signers in terms of

word order. The two older female sisters as well as the male signer show clear preference for verb-final order: 21 sentences were SOV, 4 are OSV and only one SVO. The younger sister, on the other hand, shows preference for SVO order: 7 of her 11 transitive clauses are SVO.

As noted above, this might very well be due to the fact that she had more schooling, has been exposed to Signed Hebrew, and is literate in Hebrew. Further support for the effect of schooling on word order comes from observing the word order of the children of one of the second generation signers: those children who have attended school for several years and have been exposed to Signed Hebrew or Signed Arabic use SVO order. By contrast, a younger child who has not yet attended school, as well as one of the hearing children, who were not exposed to signed Hebrew or signed Arabic, use SOV order.¹³

In other respects, the two older sisters differ from each other. One shows a clear preference for breaking an event into one-argument clauses. In her description of the 18 transitive clips, she uses 62 clauses, of which 36 are one argument clauses and 10 are two-argument clauses; that is, only 16.1% of her clauses in this task are two-argument clauses. The other older sister, as well as the younger sister, use only 35 clauses to describe these same clips (that is, they are less repetitive), and the percent of the two argument clauses is much higher (31.4%).

The clause structure of the single male signer in this study is much less clear. In many cases it is difficult to identify clauses at all. His signing is less fluid, and has many prosodic units consisting of only one sign, many repetitions and many cases of what seem to be false starts or afterthoughts. He seems to be constantly negotiating with the

addressee to make sure that he got the point across. Additionally, many of his signs for actions are mimetic, involving the whole body. ABSL has lexical signs for LOOK, RUN, FALL, SLEEP, STAND, which are used by the other signers, but this particular signer often uses mimetic depictions of these actions rather than the lexicalized signs. For example, to describe a clip in which a seated man stands up, this signer actually stood up from his chair. In those cases where clauses can be clearly identified, however, the predominant word order is SOV (8 clauses, vs. 3 clauses of OSV).

Choice and order of arguments in units larger than the clause In contrast with the consistency found in word order within a clause, discourse units larger than the clause exhibited considerable variation. As pointed out above, signers often use one-argument clauses, and when describing an event involving two or three arguments, they may break down the description into several one-argument clauses. Breaking an event into sub-events in this way presents the signer with certain choices, such as which participant to introduce first, and which verb to use in order to describe the non-active participant. Interestingly, though all signers use such sequences, the order in which the participants are introduced, and the particular way in which the event is broken down into clauses, vary greatly.

Consider, for example, the responses to a clip in which a man is showing a picture to a woman:

Signer 1: MAN SIT. WOMAN SIT. MAN PICTURE SHOW.

WOMAN LOOK.

Signer 2: WOMAN LOOK. MAN PICTURE SHOW.

Signer 3: GIRL INDEX. BOY INDEX. SHOW-PICTURE. GIRL
LOOK.

Signer 4: MAN WOMAN SIT. MAN PICTURE SHOW WOMAN.

Each signer employs a different order in introducing the participants and their actions. The first signer starts with the man sitting; the second begins with the woman looking; the third introduces the woman and then the man, followed by the event of showing the picture; and the fourth describes the man and the woman sitting, and then signs the picture-showing event.

Similarly, when describing a clip of a woman giving a shirt to a man, each signer described the event differently:

Signer 1: MAN TAKE. WOMAN GIVE.

Signer 2: MAN STAND. WOMAN SHIRT GIVE. MAN TAKE.

Signer 3: WOMAN ONE GIVE SHIRT. MAN TAKE.

The responses to some clips were more uniform. The events presented in these clips typically have one participant who is stationary, or passive, while the other participant is active. In such cases, there is a tendency in the data to introduce the stationary participant first, and then to describe the active participant and the action. For example, when describing a man tapping a girl on the shoulder, three signers located the girl (or child) first, and then described the man tapping:

Signer 1: CHILD THERE. MAN SHOULDER TAP-OTHER.

Signer 2: GIRL STAND-THERE. MAN TAP-OTHER SHOULDER
TAP-OTHER.

Signer 3: GIRL STAND-THERE. MAN SHOULDER TAP-OTHER
TAP-OTHER.

Similarly, when responding to a clip showing a woman taking a pair of scissors from a girl, all signers first described the girl holding the scissors, and then the woman approaching her and taking the scissors. Responding to a clip showing a girl feeding a woman, three of the four signers first described the woman sitting at the table, and then the girl feeding her.

It seems that the principle governing the order of introducing the participants in the above cases is that stationary participants, who constitute the background of the event, are introduced first. The principle could be stated as “background precedes foreground” (Talmy, 1983). Notice, though, that this principle is cognitive in nature, not linguistic. Crucially, it contradicts the clause-internal word order rule in ABSL, since the stationary object, which is mentioned first, is usually the patient argument, and hence the syntactic object. Thus, if an event is described in a sequence of clauses, signers often describe the patient (stationary argument) first; but if the same event is described by a single clause, then the active argument, the agent, is introduced first, typically yielding SOV order.

Returning at last to the question of whether the order of arguments is driven by discourse or syntax, we find two different patterns of order of participants once we identify clauses: clause internal order is subject first, and is very consistent within and across signers, while the order of introducing the participants is governed by cognitive or pragmatic principles in sequences of clauses and is much more varied within and across signers.

These differences suggest strongly that ABSL has syntax, a structural level that cannot be derived from or motivated by principles from another domain. The particular SOV order of ABSL cannot be explained by resorting to cognitive principles such as 'background first', nor can it be explained by discourse principles such as 'topic first', as the subject argument is not necessarily always the topic in these descriptions. Our conclusion is that ABSL has developed syntax as an autonomous level of linguistic structure by the second generation of its existence.

Coppola & Newport (2005) also found evidence for the primacy of the notion of subject in a new linguistic system. Using a series of elicitation tasks given to three homesigners, they found that homesigners consistently signed the subject, but not the topic, in initial position before the verb within a clause. Both studies, then, Coppola & Newport's and the study presented here, demonstrate that the notion of subject captures important structural generalizations even in very young linguistic systems.

Conclusion

When we first encountered ABSL, we were excited to learn what this brand-new language might tell us about the emergent properties of sign languages, about which we already had fairly strong expectations. Instead, we found that ABSL reveals more about new languages, spoken as well as signed. Like other new languages, it has little if any morphology, a fact that is attributable to its newness (Aronoff, Meir, Padden, & Sandler, 2004; Aronoff, Meir, & Sandler, 2005). It also has a robust, albeit simple, syntactic structure (Sandler, Meir, Padden, & Aronoff, 2005). Certain aspects of this syntax have already been noted in connection with other new languages. For example, Givón (1979)

remarks that pidgins, children's language, and informal language all show a preponderance of one-argument clauses. What we have now shown is that the rules governing this syntactic structure can be quite readily disentangled from, and indeed can run directly contrary to, more general cognitive and discourse-pragmatic factors, even in a brand-new language.

References

- Aronoff, M., Meir, I., Padden, C., & Sandler, W. (2003). Classifier complexes and morphology in two sign languages. In K. Emmorey (Ed.), *Perspectives on Classifiers Constructions in Sign Languages*. Mahwah, NJ: Lawrence Erlbaum.
- Aronoff, M., Meir, I., Padden, C., & Sandler, W. (2004). Morphological universals and the sign language type. In G. Booij & J. van Marle (Eds.), *Yearbook of morphology 2004* (pp. 19-39). Dordrecht/Boston: Kluwer Academic Publishers.
- Aronoff, M., Meir, I., & Sandler, W. (2005). The universal and the particular in sign language morphology. *Language*, *81*(2), 301-344.
- Baker, C., & Padden, C. (1978). Focusing on the nonmanual components of ASL. In P. Siple (Ed.), *Understanding language through sign language research (Perspectives in neurolinguistics and psycholinguistics)* (pp. 27-57). New York: Academic Press.
- Coppola, M., & Newport, E. (2005). Grammatical subjects in home sign: Abstract linguistic structure in adult primary gesture systems without linguistic input. *Proceedings of the National Academy of Sciences*, *102*(52), 19249-19253.
- Ekman, P., & Friesen, W. (1978). *Facial action coding system*. Palo Alto, CA: Consulting Psychologist Press.
- Givón, T. (1979). From discourse to syntax: Grammar as a processing strategy. In T. Givón (Ed.), *Discourse and syntax*. New York: Academic Press.
- Kisch, S. (2004). Negotiating (genetic) deafness in a Bedouin community. In J. van Cleve (Ed.), *Genetics, disability and deafness* (pp. 148-173). Washington, DC:

- Gallaudet University Press.
- Meier, R. (1990). Person deixis in American Sign Language. In S. Fischer & P. Siple (Eds.), *Theoretical issues in sign language research* (Vol. 1: Linguistics, pp. 175-190). Chicago: University of Chicago Press.
- Meier, R. (2002). The acquisition of verb agreement: Pointing out arguments for the linguistic status of agreement in sign languages. In G. Morgan & B. Woll (Eds.), *Directions in sign language acquisition* (pp. 1-25). Philadelphia: John Benjamins.
- Meier, R., Cormier, K., & Quinto-Pozos, D. (2002). *Modality and structure in signed and spoken languages*. Cambridge, UK: Cambridge University Press.
- Meir, I. (1998). *Thematic structure and verb agreement in Israeli Sign Language*. Unpublished Dissertation, Hebrew University, Jerusalem.
- Meir, I. (2002). A cross-modality perspective on verb agreement. *Natural Language and Linguistic Theory*, 20(2), 413-450.
- Meir, I., Padden, C., Aronoff, M., & Sandler, W. (in preparation). Body as Subject.
- Nespor, M., & Sandler, W. (1999). Prosody in Israeli Sign Language. *Language and Speech*, 42(2&3), 143-176.
- Nespor, M., & Vogel, I. (1986). *Prosodic phonology*. Dordrecht, Holland: Foris.
- Padden, C. (1988). *Interaction of Morphology and Syntax in American Sign Language*. New York: Garland Press.
- Sandler, W. (1999). Cliticization and prosodic words in a sign language. In T. Hall & U. Kleinhenz (Eds.), *Studies on the phonological word: Current issues in linguistic theory*. Amsterdam/Philadelphia: John Benjamins.
- Sandler, W., & Lillo-Martin, D. (2005). *Sign language and linguistic universals*.

- Cambridge: Cambridge University Press.
- Sandler, W., & Lillo-Martin, D. (2006). *Sign language and linguistic universals*.
Cambridge: Cambridge University Press.
- Sandler, W., Meir, I., Padden, C., & Aronoff, M. (2005). The emergence of grammar:
Systematic structure in a new language. *Proceedings of the National Academy of
Sciences, 102*(7), 2661-2665.
- Scott, D., Carmi, R., Eldebour, K., Duyk, G., Stone, E., & Sheffield, V. (1995).
Nonsyndromic autosomal recessive deafness is linked to the DFNB1 locus in a
large inbred Bedouin family from Israel. *American Journal of Human Genetics,*
57, 965-968.
- Senghas, A., Coppola, M., Newport, E., & Supalla, T. (1997). Argument structure in
Nicaraguan Sign Language: The emergence of grammatical devices. In E. Hughes
& A. Greenhill (Eds.), *Proceedings of the Boston University Conference on
Language Development, 21*. Boston: Cascadilla Press.
- Talmy, L. (1983). How language structures space. In H. Pick & L. Acredolo (Eds.),
Spatial orientation: Theory, research and application (pp. 225-282). New York:
Plenum.
- Wilbur, R. (1994). Eyeblinks and ASL phrase structure. *Sign Language Studies, 23*(84),
221-240.

Notes

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² Not all signers participated in both tasks.

³ We are grateful to the Language and Cognition Group at the Max Planck Institute for Psycholinguistics in Nijmegen, The Netherlands for providing some of the video clips used in our work.

⁴ We use the terms *movement* for the signifier and *motion* for the signified.

⁵ We appreciate Shannon Casey's assistance in transcribing signers' responses to these clips.

⁶ Illustrations are by Meir Etedgi of the Sign Language Research Lab at the University of Haifa.

⁷ Thanks to Ann Senghas for help in designing the new materials. We also thank the Sageev family for starring in our video clips.

⁸ By 'major prosodic unit', we refer to Intonational Phrases (IPs) or higher units, and exclude smaller prosodic breaks which more or less correspond to phrases rather than clauses.

⁹ The remaining 137 units consisted either of single noun or verb signs, or of sequences

without verbs, such as noun + location or noun + description. A small number of elicitations were unclear, and were excluded.

¹⁰ In the order type labeled “SCV”, the C stands for a complement of the verb which is not the patient argument, such as an instrument ('feed with a spoon') or location ('tap somebody on the shoulder'). Such arguments, whose syntactic role is still unclear, pattern with the patient argument (the syntactic O) in that they precede the verb.

¹¹ The remaining 66 clauses do not contain a N and a V sign, and are therefore irrelevant to the present discussion.

¹² Senghas reports a similar structure in older signers of the new Nicaraguan Sign Language (Senghas, Coppola, Newport, & Supalla, 1997).

¹³ The educational backgrounds of the deaf villagers, and the degree to which they are exposed to other languages, varies. Our field records include this information which, though relevant, cannot be discussed in detail here, due to lack of space.