The acquisition of polysynthetic languages

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To appear in Language and Linguistics Compass, 2013

Abstract

One of the major challenges in acquiring a language is being able to use morphology as an adult would, and thus a considerable amount of acquisition research has focused on morphological production and comprehension. Most of this research, however, has focussed on the acquisition of morphology in isolating languages, or languages (such as English) with limited inflectional morphology. The nature of the learning task is different, and potentially more challenging, when the child is learning a polysynthetic language – a language in which words are highly morphologically complex, expressing in a single word what in English takes a multi-word clause. To date there has been no cross-linguistic survey of how children approach this puzzle and learn polysynthetic languages. This paper aims to provide such a survey, including a discussion of some of the general findings in the literature regarding the acquisition of polysynthetic systems.

1 Introduction

Children in all cultures grow up learning language. By the age of five, they can communicate effectively in their native language or languages, although they still have a
considerable amount to learn. Learning the morphology of a language is a difficult task even for languages with small amounts of morphology and as a result, considerable acquisition research has focused on morphological production and comprehension.

Much of the literature has highlighted the challenges for learners. In Brown’s (1973) seminal research on the acquisition of morphology in English, he showed that semantic and formal complexity (on the basis of his own intuition) are causally related to the acquisition of morphemes and the development of more complex constructions. However, languages vary enormously in terms of their morphological structures, and it cannot necessarily be assumed that the challenges for learners, and the processes by which morphology is acquired, holds across all morphological types.

It is common in morphological typology\(^1\) to categorise languages in terms of the amount of obligatory morphology – the morpheme to word ratio. *Isolating* or *analytic* languages fall at one end of this continuum, having few or no bound morphs. These ratios are very low (1:1 in the extreme) such that each morpheme constitutes an independent word. Vietnamese is often cited as such a language. Since this is a continuum, many languages fall somewhere in between, with languages like English falling towards the isolating end of the continuum, with some bound morphology, albeit rather limited. *Synthetic* languages fall at the other end of this continuum, with high morpheme-to-word ratios and therefore greater morphological complexity.

A polysynthetic language is an extreme type of *synthetic* language which is capable of expressing all arguments morphologically, so that a single verb can express what would in English take a multi-word clause (Evans and Sasse 2002, also Baker 1996).

\(^1\) Although, not unproblematic (see Bauer 2003: 232ff).
Polysynthetic languages therefore achieve very high morpheme-word ratios through both agglutination and fusion (see below) and include morphological processes such as pronominal affixation, the incorporation of nouns for arguments, direct sub-categorization of arguments in the root, or use of applicative affixes.

Among the languages that fall towards the synthetic end of the continuum (including polysynthetic languages), we can distinguish agglutinating languages at one end of a continuum from fusional languages at another. Agglutinating languages are those in which we find a clear separation of bound morphs such that each morph has one meaning and a clearly identifiable form. Swahili (and other Bantu languages) is a classic example of this morphological type. In fusional languages there is no simple one-to-one correspondence between morph and function, such as in Greek and Latin.

In terms of acquisition research, much of the focus on the acquisition of morphology has been on languages that fall more towards the isolating end of the continuum, such as English, and there has been comparatively little work examining the process by which children learn synthetic languages, especially polysynthetic languages, yet we may hypothesize that the learning task may be substantially more challenging in these cases.

This is an area which cries out for investigation. In 1989, Mithun noted that opportunities for studying the acquisition of polysynthetic languages are diminishing due

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2 Not all polysynthetic languages exhibit fusion though all exhibit considerable agglutination. Because ‘agglutinating’ languages have relatively high word-to-morpheme ratios, they are also relevant to researchers concerned with the acquisition of complex morphology.
to language death and that “[t]here is much to discover in little time” (1989: p.286). Two decades later, this is even more imperative since many of the world’s polysynthetic languages are either endangered (e.g. the North American language of Dene Suliné - Chipewyan (Rice, Libben and Derwing 2002)) or are under threat (e.g. the Australian language Murrinh-Patha (Kelly, Nordlinger, Wigglesworth 2011)). As Evans and Levinson argue, to fully understand language processing, we must understand how children learn languages with structures that “vary in every possible dimension” (2009: 431) and how greater knowledge of this might contribute to what we understand about the potential universals that children bring to the task of language learning.

For children, learning a morphologically complex, polysynthetic language resembles a great big jigsaw puzzle with no picture key. Peters (1997), in a discussion of the ease or difficulty for children in learning different languages, asks how is it possible for children to acquire West Greenlandic at all. This is because West Greenlandic is a highly polysynthetic language with over 300 inflectional affixes, and a further 4-500 derivational affixes, all bound morphemes, which children appear to acquire between the ages of 2 and 5 (Fortescue and Lennert Olsen 1992).

To date there has been no cross-linguistic survey of how children approach this puzzle and learn polysynthetic languages. This paper aims to provide a brief overview to some of the general findings regarding the acquisition of polysynthetic systems. Given the small amount of available research in this area, we also draw where relevant on acquisition research focusing on other synthetic languages such as Bantu languages (e.g. Deen 2005, Demuth 1992). Although not technically polysynthetic in the sense of Evans and Sasse (2002), these languages typically have high morpheme-to-word ratios and so
present many of the same morphological challenges to the language learner.

2. **Acquisition of complex morphology**

It is no surprise that polysynthetic languages have not been the subject of much acquisition work, given that so few are adequately described even from an adult usage perspective. Indeed, much of the language description work, and particularly the acquisition research, on polysynthetic languages focuses around how these fit into or support theoretical linguistic positions of innateness and universality, since their complexity provides opportunities to assess cross-linguistically what appears to be universal about acquisition, and what is language-specific.

For example, Baker (2001, p. 655) notes that the existence of such languages “forces one to ask how is it that human linguistic capacities are articulated enough to account for the ease of language acquisition and yet flexible enough to generate languages that are superficially so different”. This review will not engage with the debate about how these languages are learned; rather it will describe how researchers have presented the unfolding of morphology in the language production of young users and some of the more relevant questions the research raises. The studies reported here are drawn together because they focus on complex morphology in acquisition. The selected studies are not intended to be exhaustive but rather to represent work across a broad array of morphologically complex languages. The majority of these studies are investigations of specific morphemes and each has different foci with little overlap in the specific areas of investigation. All engage briefly with how the language fits with reported underpinnings of word learning, so we begin with a brief look at theories of lexical
2.1 Theories of word learning

Much of the acquisition research that describes or explains how children come to learn new words, along with all their attendant morphology, takes one of three positions: (1) there are constraints on lexical acquisition around whether words refer to whole objects, whether word relations are taxonomically linked on the basis of like kind versus thematically linked, and whether children expect words to refer to only one object (Markman and Hutchinson 1984, Markman 1992, Smith 2000) and these are perhaps associated with a specialized language-learning faculty (Carey 1978, Gleitman 1990) such as an innate substantive element of bare roots/stems (Pinker 1989); (2) word learning is part of the ongoing development of general cognitive capacities (Bloom 2000); (3) word learning is an integral part of social interaction and is mediated through spontaneous everyday conversation (Tomasello 2000). Regardless of the position taken, an implicit assumption in this research is that cognitive-based findings regarding more isolating languages are likely to hold across all languages, despite the fact that many of the world’s languages are vastly different in prosodic structure, lexical forms and especially the notion of what constitutes a word. The role of memorization and rote learning, as noted by Fortescue and Lennert Olsen (1992), may be more challenging in polysynthetic languages given the sheer magnitude of stems, affixes and endings that combine in myriad ways.

The role of perceptual salience (sometimes used interchangeably with phonological salience) is often discussed in research examining early language, however the term is
rarely defined. Perceptual salience is the ease of processing of acoustic properties by the human auditory system (Leonard, McGregor and Allen 1992) whereby syllables with primary or secondary stress are more noticeable that their unstressed counterparts, and are considered more salient to children in the early stages of language learning resulting in the earlier production of stressed syllables. Peters 1983, 1985 has shown that initially children may rely more heavily on perceptual salience around prosodic structures in their early learning. Research into morphological acquisition is heavily focused on anglo-centric baselines such as Brown’s (1973) groundbreaking research into the acquisition order of the first fourteen morphemes in English. Similar orderings have been attested cross-linguistically suggesting that this approach works well for analyzing more isolating languages. While there is still some debate regarding the cognitive versus linguistic and social accessibility of such morphemes (e.g. Larsen-Freeman 2007), one area that would benefit from further investigation is the acquisition order of these morphemes in more complex languages. As already noted, because there is not a lot of comparable data across the small number of polysynthetic acquisition studies, acquisition order is not a useful means of presenting the data. Instead, although somewhat artificial, since some researchers focus their study on languages within loosely similar geographical locales (e.g. Courtney & Saville-Troike 2002, Strömqvist & Ragnarsdóttir 2000) geographical boundaries form the framework here for investigating polysynthetic first language acquisition.

2.2 Cross-linguistic studies
Studies in this overview include acquisition of forms in: languages of North, Central, and South America (Mohawk, Navajo, Tzeltal, Quiché, and Quechua, as well as Eskimo-Aleut languages (Inuktitut, Greenlandic), and Bantu languages (Sesotho, Siswati, Swahili). While not all of these languages may be considered polysynthetic, they are all highly morphologically complex, which warrants their inclusion in this discussion. Many of the studies incorporate longitudinal data, but typically for only a small number of children. While there is little direct comparability across the studies, patterns in results are evident across several of the studies and will be discussed below.3

2.2.1 Languages of the Americas

In this section we focus primarily on key studies of the acquisition of Mohawk, Quechua, Navajo, Tzeltal and Quiché. There have also been some studies on the acquisition of Cree dialects, including Oji-Cree (e.g. Upper and McKay 1987, 1988) and North-Eastern Cree (e.g. Brittain et. al. 2007, Terry 2010, Rose and Brittain 2011), but space precludes discussing these in further detail here.

Mohawk

Mithun (1989) studied the acquisition of Mohawk across five children aged around 1;9-4;9. She found that their earliest meaningful productions were segmentation of full words at a phonological level, independent of the morphological status of the syllable. Words developed leftward from the penultimate or antepenultimate syllable with the stressed

3 Throughout the paper children’s ages are given as follows: 2;1 = 2 years 1 month of age.
syllables added in these slots being produced first. Coda syllables were then added, confirming importance of the ends of words (see Bloom 2000 for discussion of similar findings in English).

This leftward movement leads the child next to the discovery of a system of pronominal prefixes. At this stage of production distinctions expressed by adults in affixes were either omitted or expressed analytically, external to this word. Mithun concluded that when utterances were complex enough to include pronominal prefixes as well as roots, the child was ready to move on to the acquisition of the morphological system as distinct from the phonological system.

In the adult language children hear pronominal prefixes in nearly every utterance and so they serve as a good measure for determining the onset of morphological awareness or metalinguistic insights into the use of morphology. Mithun notes that perceptual salience appears key to the beginnings of the acquisition process.

**Quiché**

In a study of Quiché, a Mayan language spoken in Guatemala, Pye (1980) was also interested in perceptual salience and the role it plays in determining the order of acquisition of separate morphemes. In an examination of the language use of two children age 2;0 to 3;0 over a nine month period, he focused on the order of acquisition of the set of prefixes which mark the person/number of the core arguments of the verb.

As with Mohawk, Quiché Mayan displays a complex system of verbal inflection. In the active voice, prefixes to the verb root/stem mark five categories of tense-aspect-
mood and subject/object person/number agreement. If a verb is derived from a noun or adjective, a transitivizing suffix is affixed to the root to form the verb stem. This results in a highly complex verbal predicate for the child to unravel. Focusing on the semantic complexity of the prefixes, Pye found that there was no correlation between predictions about the order of acquisition on the basis of complexity (i.e. less to more semantically complex) and the order of acquisition. The child’s earliest utterances were always monosyllabic and followed a prompt of a stressed syllable from the adult speech regardless of where in the word that syllable fell, or the semantic context of the syllable. He did, however, find a relation between the early acquisition of person markers which fall wholly within a stressed syllable, as opposed to those that straddle syllable boundaries suggesting that, as with Mohawk, perceptual salience provides the underpinning of the acquisition process in Quiché.

Tzeltal

Tzeltal is a mildly polysynthetic Mayan language spoken in Mexico. Tzeltal sentences consist of verbs and associated morphology – roots plus ergative and/or absolutive marking plus aspect marking. The lexicon has a small number of roots with productive derivational morphology. Much of the derivational morphology applies to both nouns and verbs, except only verbs take obligatory aspect marking. Brown (1998) in a study of verb development in children aged 1;4-2;6, notes that while the language is potentially obfuscating, children tend not to have issues learning the noun/verb distinction and she posits that this is due to regularity of derivational morphology and large scale distributional properties. Productivity appears to be reached early (before
children have an MLU of 2.0), at least for certain morphemes such as absolutive suffixes, as well as the vowel-initial ergative cross-referencing affixes which indicate the basic argument structure of their verbs, and morphemes appear to be used correctly before children reach 2;6 (Brown, 1998, p.743). Brown argues that the improved productivity of the vowel initial affixes over consonant-initial affixes is a result of the salience of the former.

Brown (1998) discusses her findings in relation to the research showing noun dominance in Indo-European children’s language, which has been said to occur because of the concrete nature of nouns. However, research on non-European languages shows that this noun dominance may be language-specific, and that there is an “early verb explosion” in non-Indo-European languages (e.g. Korean). Brown also points out that input may play a role here: not only do Tzeltal caregivers not engage in object naming routines, but the child is more likely to be asked “What are you doing?” than “What is that?”.

**Quechua and Navaho**

Courtney and Saville-Troike (2002) investigated morphological development and the verbal complex in Quechua and Navajo, both of which have rich morphology. The language development of four Quechua-speaking children, aged 2;0 to 3;5, from an Andean community in Peru was examined. They were recorded over a five-month period. The Navajo data were collected from five Navajo speaking children aged 1;1 to 4;7 living in Arizona, over a two year period.
In opposition to Quechua, Navajo verb roots are word final. Despite these typological differences, the researchers found that even though adult input had forms consisting of two to six morphemes, but never bare stems, the youngest children in both languages extracted bare stems and produced them, but never did so with isolated affixes. In Navajo, where stems generally are single syllables, the children omit prefixes carrying semantic information in a perceptually salient position while in Quechua they omit CV syllables, which suggests that there may be an interaction between perceptual salience, and the perceptual salience of a morpheme and its semantic role.

Where prosody is concerned, both languages have the stem/root at the periphery of the verb, which is suggested as a factor that aids extraction although the primary prosodic cues differ (tone in Navajo, word stress in Quechua). The authors point out that, given the perceptual salience of some affixes, some children could be expected to produce bare affixes, but they never do. Quechua children appear to prefer monosyllabic allomorphs, while Navajo children are not likely to hear monosyllabic morphemes since well-formed verbs in Navajo cannot normally be monosyllabic. Results also show that Quechua and Navajo children extract roots/stems first, irrespective of whether they carry primary stress (before acquiring affixes), which suggests their acquisition does not follow through from word-specific paradigms to generalized patterns of inflection. Note that, as Courtney and Saville-Troike point out, this pattern of acquisition differs from that in Quiché and Mohawk, where early verb forms consisting of the stressed syllable are initially extracted, regardless of whether it is the root/stem. The acquisition patterns also follow findings for Inuktitut (e.g. Crago and Allen 1998). They conclude that their
findings for acquisition in Navajo and Quechua indicate that inflection cannot be a completely top down process.

In relation to how children learn accuracy of morpheme order, as we will see in Deen’s (2005, 2006) findings for Swahili, Navajo children never made errors in sequencing, and neither did the three youngest Quechua speakers. However, more proficient Quechua speakers, and adults (i.e. productive users of the language) did make sequencing errors.

2.2.2 Eskimo-Aleut languages

Turning now to studies of Eskimo-Aleut languages, the primary research on these polysynthetic languages has been work on Inuktitut and Greenlandic. In their research on the acquisition of Inuktitut, Allen and Crago (1992) and Allen and Schröder (2003) provide discourse related explanations for the patterning of acquisition, in particular of argument structure and causatives. Several of the patterns highlighted have been noted in West Greenlandic and Greenlandic, which are geographically similar polysynthetic languages (Fortescue 1985, Fortescue and Olsen 1992, Strömqvist and Ragnarsdóttir 2000).

Inuktitut

Allen and Crago (1992) and subsequent work by Allen (1995, 1996, 1998, 2007) has gone beyond looking at the acquisition of noun and verb categories and focused on how smaller verbal categories are learned. In particular, Allen’s research and Allen and
Schroeder’s (2003) study, looked at the acquisition of argument structure in extended discourse, as well as the acquisition of the causatives. In Inuktitut, causation can be expressed via two means, one analytic and one lexical. There are two verb categories for causatives; one has a morphological causative, and one takes either a lexical or morphological causative depending on the semantics. Allen and Schroeder’s (2003) study focuses on how and when children learning Inuktitut learn to categorize verbs into the two classes. The study used spontaneous speech data from two longitudinal studies of eight children aged 1;0-3;6, across two monolingual communities in arctic Quebec.

Allen found three stages of causative use. At stage one (children aged 1;0-2;8), children showed no understanding of morphological causatives and did not use them, but showed some rudimentary understanding of lexical causatives. Allen suggests that children are not likely to have understanding of verb categorization at this stage. At stage two (children aged 2;0-2;9), morphological causatives are used, but not in the adult form, as they either have no inflection, no verb root or are used in fixed form. The morphological causatives used at this stage are all imperatives or first person suggestions. Lexical causatives are used with a range of frequently used verbs. Allen notes some productivity for this category, but verbless forms also appear so she concludes that children are still not sure which verbs need morphological causatives and which need lexical causatives. At stage three (where children are 3;1-3;6), children used the forms in an adult-like way (although two children over-generalised at this period).

Allen concludes that acquisition of these forms in Inuktitut follows patterns seen for English and Hebrew, where children first use unanalysed chunks. Additionally, she notes verb-by-verb learning, and a pattern of learning consistent with a phasal view of
acquisition in which children go through well-defined general stages in their cognitive and linguistic development. Further, she suggests that the research would benefit from a study of input to compare whether use of causatives in the children’s language reflected what they actually heard in the input.

**Greenlandic**

As mentioned above, West Greenlandic is a highly polysynthetic language with a very rich and complex morphophonology. Words can have numerous derivational affixes, and also have obligatory inflectional endings, with complex attachment patterns. Fortescue’s (1984) study of West Greenlandic was a pilot study with data from one child (aged 2;3) as a first step in analyzing morphological development in Greenlandic Eskimo. Fortescue and Lennert Olsen (1992) used data collected by the latter from children between 2;2 and 5;2 to explore how the children acquired all the basic parameters of this morphology during this period. In summarizing their findings, Fortescue and Lennert Olsen argue that children during this period move from single-morph utterances which address specific pragmatic functions (such as hunger, rejection) to the acquisition of new affixes which they hypothesise are acquired initially in fixed familiar contexts, and then explored in other known contexts.

Children begin acquiring this complex morphology very early and Fortescue and Lennert Olsen argue that it may be the very combinatorial flexibility of the complex morphology that assists with this, together with the very clear cut distinction “between referring expressions (with distinctive nominal endings) and action/state expressions (with distinctive verbal endings), irrespective of the internal complexity of the
expressions themselves” (p. 215). They note that the complexity of the morphophonemic system must challenge the child’s memory, and point out that adults, unless specifically trained, are generally unable to isolate bound morphemes.

2.2.3 Bantu languages

The study of the acquisition of Bantu languages has largely been driven by the work of Katherine Demuth whose work has focused on Sesotho (Demuth 1998, Demuth and Ellis 2009). While Bantu languages share several typological characteristics, Demuth (2003) highlights differences in the ordering of nominal morphology and agreement and overall acquisition order, as well as identifying several gaps in the research to date. More recently, Deen (2005, 2006) has examined the acquisition of Swahili.

Swahili

Deen’s (2005, 2006) research into the acquisition of Swahili forms the basis for one of the most detailed analyses of the acquisition of a morphologically complex language. Deen studied four children (aged 1;8-3;2) and examined the early acquisition of inflection including subject and object agreement, mood and tense prefixes. Deen (2005) examines the data of two of these children, one between the ages of 1;8 and 2;2 and the other between the ages of 2;10 and 3;0, recorded fortnightly. In this study, Deen examined subject agreement. Swahili allows subject NPs to be omitted, and so subjects were identified by context, with unclear cases excluded. Of over 400 subject agreements found across the two children, only 6 were incorrect. He argues that the fact that the
agreements occurred correctly over a range of different verbs which also showed alternations in agreement suggests that, even at 1;8, the children must have an abstract rule operating.

Of particular interest for researchers investigating polysynthetic languages are his investigations into object agreement and nominal specificity. Object agreement in Swahili is obligatory when the object is specific, but is prohibited when the object is non-specific. Deen (2006) shows that children overwhelmingly provide object agreement in obligatory contexts when the object is a personal name, is topicalized, or refers to first/second person. He argues that this cannot be due to a general strategy of overusing agreement, since object agreement never occurs in contexts which are prohibited in the adult target language, and this pattern was found at all stages in the data, where the youngest child was aged 1;10.

**Sesotho**

Sesotho is a southern Bantu language, which, like other Bantu languages, has a complex inflectional system. The language has a noun class system in which the nominal stem is invariant, and has a set of singular/plural class prefixes with inflectional agreement associated with each noun phrase, and generally phonologically related to the noun class marker. The verbal complex encodes subject/object marking, tense/aspect and grammatical marking of functions such as passive, applicative, causative and reflexive (Demuth 1992). Demuth’s (1989, 1992, 1998, 2003) long-term research on Sesotho has largely come from her longitudinal spontaneous language recordings of four children in Lesotho, aged around 2;1-4;7. In general, Demuth has shown that Sesotho learners are
able to master complex grammatical constructions such as passives and relative clauses at an early age compared to English learners, with the spontaneous and creative production of passives, relatives clauses and left dislocated constructions before the age of three. In her study of applicatives, Demuth (1998) examined two children’s spontaneous speech interactions at ages 2;1-2;6 and 3;0-3;2 and showed that by 2;6, children were using the applicative productively as opposed to “as an unanalyzed, frozen form”. As Demuth (1992) argues, Sesotho children’s early acquisition of structures for which grammatical, cognitive or maturational reasons are normally provided for their later acquisition in Indo-European languages, points to the need for additional cross-linguistic research to determine whether differences in the acquisition of these constructions are grammatically driven (i.e. a similar acquisitional order is found, for example, in other Bantu languages such as Zulu) or cognitive/maturational which might result from frequency, or other effects.

2.3 Hooks to learning

We can see throughout this survey of polysynthetic language acquisition that for those languages where the identification of roots or stems is relatively easy, there are similarities in the acquisition process. Data from Quiché Mayan and Mohawk suggest that children learning these languages initially produce the most perceptually prominent units of speech and continue to rely on perceptual salience until the morphology is finally discovered. Although children learning Navajo, Inuktitut, Quechua and Tzeltal initially produce bare roots, which are not always the most perceptual units in these languages, perceptual salience appears to also play an important role in helping the child identify
these units. Initial productions consisting entirely of bare roots appear to occur only in languages in which there is some regular perceptual property that enables the consistent identification of the roots in the input. It may be that a major piece of the puzzle is missing here, that is the degree of fusion; in agglutinating languages it is very likely to be easier to identify syllable-sized morphemes than those which are not, and more difficult again where they are part of highly fused complexes.  

On the basis of Xanthos et al’s (2012) research which compared languages of varying morphological richness, it would appear to be the case that children’s acquisition of languages which exhibit morphologically rich inflectional systems correlate with the relative morphological richness of that language. Xanthos et al’s (2012) cross-linguistic study compared the longitudinal acquisition of nine children from nine different language backgrounds with varying degrees of morphological complexity using a mean size of paradigm index, where paradigmatic richness “refers to the tendency of a language to have a large number of formally distinct inflected word-forms per lemma” (2012, p. 464). Using this new measure, they conclude that there is a strong correlation between the morphological complexity of the input and the speed with which children acquire the morphological richness of the language.

This suggests it is not necessarily the case that greater morphological complexity leads to a more challenging task for the child. In fact it appears to be the case that the more morphology there is in a language, and therefore the more morphology the child receives in the input, the more rapidly the child acquires the morphology. This suggests that frequency may override morphological complexity in the acquisition process. But it

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4 We are grateful to one of our anonymous reviewers for this insight.
remains to be seen to what extent this is generalizable because we do not currently have access to the necessary data.

3. Conclusion

Although there is still much research to be done in the acquisition of polysynthetic languages, the existing literature reveals a number of interesting findings:

Firstly, the research suggests that a lot more work is needed in the area of perceptual salience to determine whether it is a primary factor driving early acquisition of polysynthetic languages. Courtney and Saville-Troike (2002) suggest that morphological factors drive the acquisition of Quechua and Navajo, with roots/stems being extracted in early verb forms irrespective of their perceptual salience. This raises the interesting question of what children do when the root/stem is discontinuous in the verbal word, as in the Australian language Murrinh-Patha (Nordlinger 2010).

Secondly, morphological complexity does not always lead to acquisitional complexity. In fact, Xanthos et al.’s (2012) study suggests that the more morphologically rich the language, the easier the morphology is to acquire. This concurs with Demuth’s (e.g. 1992) research showing the early acquisition of causatives and applicatives by Sesotho children. Such findings suggest that the relevant factor for acquisition may not be morphological complexity, but morphological regularity. Polysynthetic languages contain words with many morphemes, and expressing complex grammatical concepts, but may be relatively regular in the templatic sequence in which they are used.
Following from these above two points, on the basis of the study of these languages, it is not clear what the role of ‘chunking’ (storing unanalyzed exemplars or chunks) may play in the acquisition of polysynthetic languages. Researchers have suggested that children store their early uses as unanalyzed amalgams or chunks. These would be attested at the stage where the child stores whole units before having analyzed the unit into its smaller components. Peters (1983, 1985), Pinker (1989) and Slobin (1985) argue that the child extracts entire utterances from the speech stream before beginning the process of segmentation. If children do this, we would expect to find learners of languages with complex distributed morphology to be producing ungrammatical unanalyzed chunks on the basis of the speech context – a finding that does not appear strongly in the literature. In fact Rose and Brittain (2011) have suggested that such chunking plays a relatively minor role in the acquisition of Northern East Cree as merely the first step in order for the child to perform further grammatical analysis. It remains to be seen what the role of chunking is in other synthetic and polysynthetic languages.

Finally, studies such as Xanthos et al (2012) demonstrate the role that input may play in understanding children’s acquisition of complex morphology, highlighting the need for input-based research as well as acquisition based research of the type discussed here.

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