1-1-2014

Compounds, learning mechanisms, and the continuity hypothesis in language acquisition

Jessica Gamache
Michigan State University, gamache1@msu.edu

Cristina Schmitt
Michigan State University, schmit12@msu.edu

Compounds, learning mechanisms, and the continuity hypothesis in language acquisition

Abstract

Nobody denies that the input plays an important role in language acquisition, but the issue as to whether the input is sufficient to drive language learning is still a matter of debate. In this paper we examine children's acquisition of synthetic compounds in English and Dutch. Despite having necessarily different input, Dutch- and English-speaking children produce the same set of non-adult forms when acquiring synthetic compounds: *drive-truck* and *driver-truck,* but not *truck-drive*. In this paper we review three proposals for the English-speaking children's data and examine how they fair in light of the Dutch-speaking children's data. The proposals fall into two types: (i) input-driven proposals that argue that frequent, but unrelated, aspects of the input are causing the non-adult forms we see and (ii) grammar-driven proposals that argue that the children's non-adult forms are actually driven by the adult derivation. Given the inability for the two experience-driven accounts to explain why Dutch- and English-speaking children produce the same non-adult forms, we will ultimately claim that only a proposal that relies on the grammar explains the data at hand. More specifically we argue that children proceed from their earliest non-adult productions to the adult *truck-driver* form in a manner consistent with a strong version of the continuity hypothesis. Rather than being approximations of the adult forms that are affected by other constructions in the input, the forms that children produce are steps in the adult derivation of synthetic compounds. As children learn more about the structure and can confidently advance the structure without missing any of the adult features, the forms progress towards the adult *truck-driver* form.

Compounds, learning mechanisms, and the continuity hypothesis in language acquisition

Jessica Gamache and Cristina Schmitt

1 Introduction

Nobody denies that the input plays an important role in language acquisition, but the issue as to whether the input is sufficient to drive language learning is still a matter of debate. In recent work, Perfors et al. (2011) argued that, given sufficient data, a Bayesian learner can arrive on hierarchical representations in language. If correct, Perfors et al. showed that a key component of language, binary merge, does not need to be innately-specified, but rather can be extracted from the input. Berwick et al. (2011) point out, however, that a Bayesian learner simply chooses one grammar from pre-specified set of grammars, one of which was a hierarchical grammar in the case of Perfors et al.'s study. In other words, children could choose a hierarchical grammar based on the input *but only if a hierarchical grammar were pre-specified as a possibility*. Assuming that we are endowed with a linguistic capacity that includes an ability to sort through the input for the relevant information, we still need to understand how much and what kind of information taken from the input is used by children as they acquire their native language.

In this paper we examine children's acquisition of synthetic compounds in English and Dutch. Across a number of studies English-speaking children have been shown to reliably produce a particular pattern of non-adult forms: *drive-truck* and *driver-truck,* but not *truck-drive* (Clark et al. 1986, Nagpal and Nicoladis 2009, Gamache and Schmitt to appear). This pattern of non-adult forms has led researchers to propose accounts that are mostly experience-driven and place almost all the weight on aspects of the input in general, not necessarily compound structures per se (Clark et al. 1986, Nagpal and Nicoladis 2009) and also accounts that rely on children's understanding of the derivation of compounds (Gamache and Schmitt to appear).

The experience-driven proposals vary in terms of how much they depend on particular aspects of English: one account relies on the fact that English is an SVO language (Clark et al. 1986) and the other on the fact that English contains a particular set of deverbal compounds (Nagpal and Nicoladis 2009). Interestingly, Dutch-speaking children produce the same set of non-adult forms when acquiring synthetic compounds (Brisard et al. 2008), despite the fact that their input necessarily differs from that of English-speaking children, at least with respect to surface word order.

In this paper we examine Dutch compound acquisition data in light of these three proposals. Given the inability for the two experience-driven accounts to explain why Dutch- and English-speaking children produce the same non-adult forms, we will ultimately claim that only a proposal that relies on the grammar explains the data at hand. More specifically we argue that children proceed from their earliest non-adult productions to the adult *truck-driver* form in a manner consistent with a strong version of the continuity hypothesis (Pinker 1984). Rather than being approximations of the adult forms that are affected by other constructions in the grammar, the forms that children produce are steps in the adult derivation of synthetic compounds. As children learn more about the structure and can confidently advance the structure without missing any of the adult features, the forms progress towards the adult *truck-driver* form.

Section 2 describes the English- and Dutch-speaking children's data. In Section 3 we present our analysis of the English-speaking children's non-adult forms, as well as the competing analyses, and extend each to the Dutch data. Finally, in Section 4 consequences for theories for acquisition are discussed.

2 Children's Synthetic Compounds

It is well known that children are conservative in their use of the grammar and frequently produce omission errors but rarely commission errors (Snyder 2007). Rather than produce commission errors, children's forms are not too off target. This, however, might be a function of free speech data where avoidance of a form is always an available strategy. For this reason, free production largely tells us one of two things about the current state of a child's grammar: (i) children know

and produce the adult form or (ii) children do not produce the adult form, but may have anywhere between no and adult-like knowledge of its properties. In order to examine children's knowledge of a form prior their acquisition of all of its features, elicited production tasks can be used to elicit otherwise avoided forms and get a snapshot of a child's current representation.

A number of researchers have used elicited production to examine children's synthetic compounds (English: Clark et al. 1986, Nagpal and Nicoladis 2009, Gamache and Schmitt to appear; Dutch: Brisard et al. 2008). The general format of these studies is as follows. A small number of primes are first used to introduce the child to the target form, as in (1). Next, children are shown images and prompted to come up with a name for the pictured person or machine, as in (2).

(1) Example prime: This is a man who always reads book. We could call a man who always reads books a *book-reader.*

(2) Example prompt: This is a man who always cuts apples. What could we call a man who always cuts apples? (target: *apple-cutter*)

For English, the results of Gamache and Schmitt's (to appear) study are presented in Table 1. Forty-eight English-speaking children participated, with sixteen children in each of the 3-, 4-, and 5-year-old age groups. Each child was prompted to produce twelve synthetic compounds, six for humans (agents) and six for machines (instruments).

The results of this study showed that English-speaking children become more proficient synthetic compound producers around age five. In addition to producing the target synthetic compound form, some children used other non-target but nevertheless adult forms, such as simple *–er* nominals (*driver*) and noun-noun compounds (*truck-man*). The younger children produced a constrained set of non-adult forms: children produced verb-noun (VN) *drive-truck* and verb-*er*-noun (V*er*N) *driver-truck,* but noun-verb (NV) *truck-drive* was almost completely unattested. The results of this study differ very little from the findings of Clark et al. (1986) and Nagpal and Nicoladis (2009).

	Form	Example	3-year-olds		4-year-olds		5-year-olds	
			%	(N)	%	(N)	%	(N)
Forms with V and N	NV*er*	*truck-driver*	23	(45)	38	(73)	72	(139)
	V*er*N	*driver-truck*	07	(13)	07	(13)	03	(6)
	VN	*drive-truck*	04	(7)	09	(18)	04	(8)
	NV	*truck-drive*	01	(1)	00	(0)	01	(1)
Adult-like, non-target forms	V*er*	*driver*	07	(13)	07	(13)	01	(2)
	NS	*truck-man*	07	(14)	04	(8)	05	(9)
Other	---	---	51	(99)	35	(67)	14	(27)
		Total *N*	192		192		192	

Table 1: Distribution of production forms (percentages and Ns) by age group for English study.

	Form	Example	3-year-olds	4-year-olds	5-year-olds
			%	%	%
Forms with V and N	NV*er*	*appeleter*	28	65	69
	V*er*N	*eterappel*	14	06	04
	VN	*eetappel*	25	18	16
	NV	*appeleet*	03	00	05
Other	---	---	35	11	06
		Total *N*	80	80	80

Table 2: Distribution of production forms (percentages) by age group for Dutch study.

The results for Dutch (Brisard et al. 2008) are presented in Table 2. Twenty-four Dutch-speaking children participated, with eight children in each of the 3-, 4-, and 5-year-old age groups. Each child was prompted to produce ten synthetic compounds. Like the English-speaking children,

Dutch-speaking children become more proficient synthetic compound producers over time. Before producing adult-like forms, Dutch children also produced VN and V*er*N forms but again almost never produced NV forms. Note that the Dutch-speaking children's rate of adult-like forms goes up earlier, but this could be due to the lower number of both items and participants tested.

While the details of the design and materials differ slightly, the results of the previous studies are consistent: both Dutch- and English speaking children (i) regularly produce order errors where the verb shows up before the noun (VN and V*er*N), and (ii) almost never produce non-adult forms with NV order but no –*er*.

3 Analyzing Children's Synthetic Compounds

There have been three different proposals to account for the English-speaking children's non-adult forms: (i) children's non-adult forms are driven by the sentential word order of English (Clark et al. 1986); (ii) children's non-adult forms are driven by other deverbal structures in English, such as *dump-truck* (Nagpal and Nicoladis 2009); and (iiii) children's non-adult forms are driven by the derivation of the adult form (Gamache and Schmitt to appear). We will first discuss our analysis of the English-speaking children's data and show how it can straightforwardly be extended to the Dutch-speaking children's data. We will then present the two others approaches and see how they fair in light of the Dutch data.

3.1 Children's Forms as Steps in the Adult Derivation

In Gamache and Schmitt (to appear) we proposed that English-speaking children's non-adult forms are steps in the adult synthetic compound derivation. In other words, the only forms that children produce are steps that exist in the adult grammar, albeit are not produced by adults.

We assumed a Distributed Morphology-type analysis (Halle and Marantz 1993), with the structure being built as in (3). First, the verb and internal argument are merged, leading to the *drive-truck* form. Next, -*er* is merged into the structure, nominalizing *drive-truck*. *drive* then incorporates into –*er,* leading to the *driver-truck* form. Finally, *truck* moves to the specifier of the *drive*(*er*) head leading to *truck-driver.*
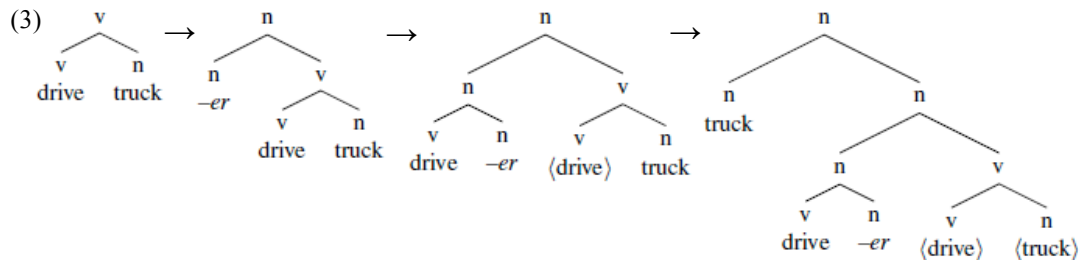
The analysis proposed above brings synthetic compounds closer to noun-noun compound recent analyses (Delfitto 2009, Keyser and Roeper 1992). In many analyses of noun-noun compounds, the head *house* and modifier *dog* are first merged leading to *house-dog*. Next, the modifier *dog* moves to the left of the head *house* leading to *dog-house.* It could be argued that the movement of the modifier in noun-noun compounds and the internal argument in synthetic compounds are both the same movement. In both cases some EPP-like feature forces movement of the modifier to the left of the head noun, which then allows the compounds to abide by the obligatory right-hand head rule in English (Williams 1981). A similar notion is discussed in Keyser and Roeper (1992).

In addition to this analysis of synthetic compounds having the ability to explain the non-adult forms that children produce and bring the derivations of noun-noun and synthetic compounds in line, it is also an improvement over recently proposed structures (for example, Harley 2009) as it also accounts for (i) the thematic restriction between the verb and the internal argument and (ii) the lack of **to truck-drive, *to book-read* kinds of verbs in English.

In summary, according to our analysis children's slow acquisition of the structure of synthetic compounds is due to their slow acquisition of certain properties of the structure. Aside from its

morpho-phonological form as the suffix /ɚ/, children much learn that –*er* is agentive and its syntax has an EPP-like feature that drives the movement of the internal argument.

3.1.1 Extending Our Analysis to Dutch

Our analysis of English-speaking children's non-adult synthetic compound forms proposes that they are driven by the adult derivation of synthetic compounds. Therefore, if two languages share a common synthetic compound structure, it would be expected that child speakers of both languages would produce the same non-adult forms. If two languages do not share a common structure, child speakers of the two languages should produce a different set of non-adult forms.

   Our analysis can be straightforwardly extended to Dutch with one key assumption: Dutch and English synthetic compounds have the same syntactic structure. With the assumption that Dutch is underlyingly SVO, and therefore Dutch and English have the same synthetic compound structure, it then follows directly that Dutch- and English-speaking children should produce the same non-adult forms. That is, given that Dutch- and English-speaking children are targeting the same adult form, with the same derivational steps, their non-adult forms, which we argue are steps in the adult derivation, should be the same. This analysis matches the data that we see in Tables 1 and 2.

   The assumption that Dutch and English share the same synthetic compound structure is closely tied to a related debate in the field about the word order of Dutch: is it underlyingly SOV, as was historically thought, or SVO? We are working under the assumption that Dutch is SVO (Zwart 1993, Kayne 1994), and in fact, the forms produced by the Dutch-speaking children offer further support for this claim. In both languages there is a pattern of VN-ordered forms, but it is actually the Dutch-speaking children who appear to be producing these forms more often. The use of VN *drive-truck* but not NV *truck-drive* forms in the Dutch-speaking children's speech supports the hypothesis that rather than going directly from NV *truck-drive,* which might be the base structure if Dutch were SOV, to *truck-driver,* children are actually beginning with VN *drive-truck,* then building V*er*N *driver-truck*, and finally NV*er truck-driver*.

3.2 Competing Analyses

While our analysis of children's non-adult synthetic compound forms focuses on children's building of the adult structure, the other two proposals to explain these forms focus on the frequency of other forms in the input. The frequency argument in both cases suggests that particular aspects of English that are frequent in the input affect the acquisition of synthetic compounds. These frequency accounts will be discussed in turn, first in their ability to account for the English data, and then the Dutch data.

3.2.1 The Influence of Sentential Word Order

The two attested non-adult forms follow the normal clausal order of English. Both VN *drive-truck* and V*er*N *driver-truck* place the internal argument after the verb as they would be in a sentence such as 'Bill drives a truck.' Given the frequency with which children see the verb and internal argument in VN order, and also the early age at which clausal word order is acquired, Clark et al. (1986) claimed that these non-adult forms are caused by a reliance on sentential word order. It is only after children acquire –*er* that they begin to change the order of the verb and noun to begin to reflect the ordering in the synthetic compound as opposed to the sentence.

   While Clark et al.'s approach is intuitive and leads to a good approximation of the English-speaking children's data, it critically relies on the fact that English-speaking children hear VO frequently in their input and produce VN-ordered synthetic compound forms. Dutch, whose surface word order alternates between VO and OV, is a good test case for this theory: given that the input children receive is a mixture of OV and VO, Clark et al.'s proposal would predict that children's non-adult forms should also be a mixture of NV and VN forms.

   We can see from Table 2, however, that this is not the case: Dutch-speaking children produce an abundance of VN forms, but not NV forms. How then could Clark et al.'s proposal be saved? One could imagine that the input to child contains mostly simple sentences that include only a subject, verb, and an object, and therefore would have the word order SVO. If this were the case then Dutch-speaking children, under Clark et al.'s proposal, would not be expected to produce NV

forms. However, Evers and van Kampen (2004) report that 45% of the input to Dutch-speaking children is OV, resulting from the high usage of modals with children. The input to English-speaking children, on the other hand, is nearly 0% OV. Given this difference in input, and Clark et al.'s proposal that sentential word order drives children's non-adult forms, Dutch-speaking children should produce more NV errors than English-speaking children. This prediction, however, does not hold. In fact, despite the Dutch-speaking children only receive 55% VO input, they produce *more* VN forms than the English-speaking children who receive nearly 100% VO input. Therefore we conclude that Clark et al.'s proposal does not hold cross-linguistically. While the intuition that sentential word order affects children's non-adult forms is on the right track, it appears to not be sentential word order, but rather the underlying structure of the verb and internal argument, that forms the basis of the non-adult forms that children produce.

3.2.2 The Influence of Other Constructions

Nagpal and Nicoladis (2009) argued that it is the frequency of other deverbal constructions, rather than the frequency of sentential word order, that leads to the non-adult forms that English-speaking children produce. Many constructions in English have the word order verb-noun, such as compounds like VN *dump-truck* and V*ing*N *reading-lamp.* This order, verb-noun, is also the order of the verb and internal argument in the non-adult forms that English-speaking children produce. According to Nagpal and Nicoladis' claim, children produce the non-adult forms that they are because they are interchangeably using the compound structures leading to incorrect constructions.

Let's consider what it would mean for children to be using these constructions interchangeably. First, the way in which adults and children assign interpretative roles to compounds must be different. Namely, adults have a single interpretation that they assign to each compound-type, while children must allow for multiple interpretations to be mapped to multiple compound-types. Second, given the looser interpretations assigned to each type, children would be expected to both produce VN and V*ing*N when targeting NV*er* and also NV*er* when targeting VN and V*ing*N. Finally, if either of these does not hold, then the competing compound-type should be at least equally frequent, if not more frequent, than synthetic compounds in the input in order to have this asymmetrical effect on them. We will address each of these points in turn.

To begin, if children produce the incorrect structure (for example, the word order and morphology of *dump-truck* when they want to say *truck-driver,* leading to *drive-truck*) then they must be primarily taking into account the order of the constituents (verb, noun) rather than the relation that holds between the constituents and the meaning of the morphology that they contain. Considering just the deverbal compounds, NV*er truck-driver,* VN *dump-truck,* and V*ing*N *reading-light,* each has different relations that hold between the constituents and different morphology. Synthetic compounds are interpreted with a function-type relation (a *truck-driver* is a person who has the function of driving trucks). The *–er* morphology represents the agent of the activity. For both *dump-truck* and *reading-light* there is a different relation that holds: the head noun is used for the purpose of verb-*ing*. A *reading-light* is a light that is used for reading and a *dump-truck* is a truck that is used for dump(ing). *Reading-light* contains *–ing* morphology and *dump-truck* contains no morphology. For children to be producing VN or V*ing*N structures when the target is NV*er* they must be allowing for a looser interpretative role assignment between the constructions.

Assuming that it is the case that children allow multiple interpretations for each compound construction, children should produce a large set of non-adult forms formed by crossing all of the possible combinations of word order and morphology. That is to say, if VN and V*ing*N constructions interfere in children's production of NV*er*, as Nagpal and Nicoladis have claimed, then NV*er* should also interfere in children's production of VN and V*ing*N. This claim predicts that children would produce a number of forms that are not attested in the literature. Taking, for example, compounds like VN *dump-truck* and VingN *reading-lamp* we would expect the following non-adult forms in Table 3.

Looking first at the predicted forms for the *truck-driver* target, we know from the production studies discussed above that the greyed forms are attested in children's speech. However, two logical possibilities *truck-driving* and *truck-drive* are not attested in any of the production studies to date. Moreover, while there are no production studies of VN and VingN compounds, the non-adult form types for *dump-truck* and *reading-lamp* are not discussed in the literature, despite being quite

salient (for example, *lamp-reader* in the place of *reading-lamp*). In other words, there appears to be a unidirectionality of the VN and V*ing*N compounds affecting NV*er* compounds, but NV*er* compounds not affecting VN and V*ing*N compounds.

Target	Word order	Morphology		
		-er	*-ing*	*-Ø*
truck-driver	VN	driver-truck	driving-truck	drive-truck
	NV	truck-driver	truck-driving	truck-drive
dump-truck	VN	dumper-truck	dumping-truck	dump-truck
	NV	truck-dumper	truck-dumping	truck-dump
reading-lamp	VN	reader-lamp	reading-lamp	read-lamp
	NV	lamp-reader	lamp-reading	lamp-read

Table 3: Possible non-adult forms based on word-order and morphology of NV*er*, VN, and V*ing*N.

Let's consider how it could be the case that children are loosely assigning interpretations to each compound construction, but yet they are only unidirectionally producing non-adult forms from V*ing*N and VN compounds to NV*er* compounds, but not the reverse. One possibility is to consider the relative frequencies of these constructions. If VN and V*ing*N compounds are more frequent than NV*er* compounds, it could be the case that VN and V*ing*N compounds affect children's production of NV*er* compounds, but NV*er* compounds have no effect on children's production of VN or V*ing*N compounds. Our corpus analysis does not support this claim. Table 4 presents the results of our corpus analysis in which examined all of the compounds in the input to both Adam and Sarah from age 2;3 to 4;6 in the Brown (1973) corpus on CHILDES (MacWhinney 2000). Notably, all deverbal compounds were very infrequent in the input when compared to noun-noun compounds. Relative to each other, slightly more VN compounds were used than NV*er* compounds, but in general, the frequencies in terms of types and tokens are similar.

Compound	Example	Adam	Sarah
NV*er*	*truck-driver*	15 (103)	8 (34)
VN	*dump-truck*	18 (58)	18 (77)
V*ing*N	*reading-lamp*	6 (51)	8 (24)
NN	*book-shelf*	200 (~1000)	175 (~700)

Table 4: Type (and tokens) of compounds in adult speech in Brown (1973) corpus.

Nagpal and Nicoladis claimed that English-speaking children's non-adult forms are due to the influence of other forms in the input. When considering all of the predictions of this claim, we see that this analysis of the children's non-adult forms does not hold in English. First, it is unlikely that children ignore the meaning of each compound type when producing NV*er* compounds. Second, while a subset of forms predicted by Nagpal and Nicoladis' analysis are attested, there is an entire set of predicted forms that are not attested. Lastly, while the lack of predicted forms could be due to VN and V*ing*N forms being highly frequent in comparison to NV*er* forms, we see in Table 4 that this is also not the case. While VN and V*ing*N forms are asymmetrically influencing the NV*er* forms, they are no more frequent in the input to the children. Given these issues with the analysis of Nagpal and Nicoladis, we conclude that competing constructions cannot account for the non-adult synthetic compound forms that English-speaking children produce. For the same reasons, Nagpal and Nicoladis' analysis is not able to account for Dutch, which has a similar set of "competing constructions" and similarly lacks a number of non-adult forms produced by children that would give support to this claim.

3.3 Discussion

In this paper we compared the analyses of the non-adult synthetic compound forms produced by Dutch- and English-speaking children. These forms, VN *drive-truck* and V*er*N *driver-truck*, have been analyzed in three ways: (i) as steps in the adult derivations (Gamache and Schmitt to appear),

(ii) as carryovers from the frequent sentential word order (Clark et al. 1986), and (iii) as carryovers from competing deverbal compounds (Nagpal and Nicoladis 2009). In this section we have shown that the full set of predictions of the two frequency-based accounts (sentential word order and competing deverbal compounds) are not attested in Dutch- and English-speaking children's speech. The word-order approach fails to account for why Dutch-speaking children produce more VN forms than English-speaking children, but no NV forms, despite their sentential input being 45% OV. The competing deverbal compound approach does not seem to make the right predictions either. We conclude that a frequency account is not tenable, while the data from both the Dutch- and English-speaking children supports the hypothesis that children's non-adult forms are steps in the adult derivation, built in a continuous manner as they acquire all of the properties of the synthetic compound structure.

4 Consequences for Theories of Acquisition

In this paper we examined the extent to which children's non-adult synthetic compound forms could be explained by a number of different acquisition theories. We presented the results of previous elicited production studies from Dutch- and English-speaking children and showed that child speakers of both languages produce particular forms to the exclusion of other, possible forms. Specifically, child speakers of both Dutch and English produce VN *drive-truck* and V*er*N *driver-truck*, but (largely) fail to produce NV *truck-drive*. We then went on to argue that, while previously proposed frequency accounts explain some subset of the data, the hypothesis that children are continually attempting to master the adult form by building up the adult derivation is best supported by both the Dutch and English data.

From an acquisition perspective, the results highlight the short-falls of frequency alone as an explanation for children's behavior in cases in which non-adult forms are produced and cannot be associated to the particular construction nor with other related constructions. Rather, these frequency-based accounts described how children *fail* to acquire synthetic compounds. Missing from both of these theories is how children use the relevant information in the input to ultimately learn the synthetic compounds structure. This is a notion that is explored in detail by Crain (2012). According to our proposal, children acquire synthetic compounds, and language more generally, by acquiring evidence and producing forms that are in line with the adult derivation, albeit not the target adult derivation.

References

Berwick, Robert, Paul Pietroski, Beracah Yankama, and Noam Chomsky. 2011. Poverty of the stimulus revisited. *Cognitive Science* 35:1207–1242.

Booij, Geert. 1988. The relation between inheritance and argument linking: Deverbal nouns in Dutch. In *Morphology and Modularity*, ed. M. Everaert, A. Evers, R. Huybregts, and M. Trommelen, 57–74. Dordrecht, NL: Foris.

Booij, Geert. 2009. Compounding and construction morphology. In *The Oxford Handbook of Compounding*, ed. R. Lieber and P. Stekauer, 201–216. New York, NY: Oxford University Press.

Brisard, Frank, Eva Laarman, and Elena Nicoladis. 2008. Clausal order and the acquisition of Dutch deverbal compounds. *Morphology* 18:143–166.

Brown, Roger. 1973. *A First Language: The Early Stages*. Cambridge, MA: Harvard University Press.

Chomsky, Noam. 1980. *Rules and representations*. New York, NY: Columbia University Press.

Clark, Eve, Barbara Hecht, and Randa Mulford. 1986. Coining complex compounds in English: Affixes and word order in acquisition. *Linguistics* 24:7–29.

Crain, Stephen. 2012. *The Emergence of Meaning*. Cambridge: Cambridge University Press.

Delfitto, Denis, Antonio Fabregas, Chiara Melloni. 2009. Compounding at the interfaces. In *Proceedings of NELS*.

Gamache, Jessica, and Cristina Schmitt. To appear. Children's forms as derivational steps: external evidence for a new synthetic compound structure. In *Proceedings of the 2012 Chicago Linguistic Society Meeting*.

Gamache, Jessica, Kyle Latack, Mina Hirzel, and Cristina Schmitt. To appear. Noun categories in children's production of noun-noun compounds. In *Proceedings of the 2013 Generative Approaches to Language Acquisition Meeting*.

Halle, Morris, and Alec Marantz. 1993. Distributed morphology and the pieces of inflection. *The View from Building 20*, 111–176.

Harley, Heidi. 2009. Compounding in distributed morphology. In *The Oxford Handbook of Compounding*, ed. R. Lieber and P. Stekauer, 129–144. New York, NY: Oxford University Press.

Kayne, Richard. 1994. *The Antisymmetry of Syntax*. Cambridge, MA: MIT Press.

Keyser, Samual J. and Thomas Roeper. 1992. Re: The abstract clitic hypothesis. *Linguistic Inquiry* 23:89–125.

Lieber, Rochelle. 1983. Argument linking and compounding in English. *Linguistic Inquiry* 14:251–286.

Lieber, Rochelle. 1992. *Deconstructing Morphology*. Chicago, IL: The University of Chicago Press.

MacWhinney, Brian. 2000. *The CHILDES Project: Tools for Analyzing Talk. Transcription, Format, and Programs*. Routledge.

Nagpal, Jaya, and Elena Nicoladis. 2009. Why are noun-verb-er compounds so difficult for English-speaking children? *Mental Lexicon* 4:276–301.

Perfors, Amy, Joshua Tenenbaum, and Terry Regier. 2011. The learnability of abstract syntactic principles. *Cognition* 118:306–338.

Pinker, Steven. 1984. *Language Learnability and Language Development*. Cambridge, MA: Harvard University Press.

Selkirk, Elisabeth. 1982. *The Syntax of Words*. Cambridge, MA: MIT Press.

Snyder, William. 2007. *Child Language: The Parametric Approach*. Oxford: Oxford University Press.

Tomasello, Michael. 2000. The item-based nature of children's early syntactic development. *Trends in Cognitive Sciences* 4:156–163.

Williams, Edwin. On the notions "lexically related" and "head of a word". *Linguistic Inquiry* 12:245–274.

Zwart, Jan-Wouter. 1994. Dutch is head initial. *The Linguistic Review* 11:377–406.

Department of Linguistics and Languages
Michigan State University
East Lansing, MI 48824
gamache1@msu.edu
schmit12@msu.edu