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On the Syntax-Morphology Interface in the Acquisition of French and English

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0. Introduction

When a child learning English acquires any of the commonly used argument structures that were analyzed in (Larson 1988a,b) as complex predicate constructions, the other members of this group appear in the child's speech soon afterwards (Snyder & Stromswold 1997; Snyder 1995a,b; Stromswold & Snyder 1995). Relevant constructions include double object and prepositional dative constructions, verb-particle constructions, make-causatives, perceptual reports, and put-locatives (1a-f).

(1) a. Mary picked the book up / picked up the book (Verb-Particle)
   b. Fred made Jeff leave. (Make-causative)
   c. Fred saw Jeff leave. (Perceptual report)
   d. Bob put the book on the table. (Put-locative)
   e. Alice sent Sue the letter. (Double Object Dative)
   f. Alice sent the letter to Sue. (Prepositional Dative)
   g. John painted the house red. (Resultative)

Similar though not identical patterns are attested in cross-linguistic variation. Notably, French and Spanish have been widely observed to contrast with the Germanic languages, in that they disallow even an apparent counterpart to the English verb-particle construction, make-causative, double-object dative construction, or resultative construction (e.g. Green 1973, Kayne 1984, Levin & Rapoport 1988). The acquisitional

1 Among the various types of dative constructions and verb-particle constructions found in English there exist additional acquisitional ordering effects, which are discussed in detail in (Snyder & Stromswold 1997), (Hyams, Schaeffer, & Johnson 1993), and (Bennis, den Dikken, Jordens, Powers, & Weissenborn 1995). On the Larsonian approach to English complex predicate constructions, see also (Marantz 1993), (Hale & Keyser 1993), and (Chomsky 1993), among others. For evidence that certain complex predicates and related constructions may exhibit a systematic acquisition relationship in L2 learning, see (Siabakova 1996).

2 Children's early knowledge of the English resultative construction has been difficult to assess, because of the relatively low frequency of the construction in the spontaneous speech of both children and adults. For purposes of cross-linguistic comparisons, however, the resultative is in several respects an ideal diagnostic for the availability of Larsonian complex predicates (Snyder 1995b).
evidence from English suggests that a single point of parametric variation is responsible for the availability of a large class of complex predicates in English, and indeed, a number of possible non-parametric explanations for the data have been empirically evaluated and rejected in (Snyder & Stromswold 1997). The acquisitional findings thus call into question the degree to which the English put-locatives, perceptual reports, and prepositional dative are in fact syntactically comparable to their apparent Romance counterparts.

The nature of the parametric variation responsible for these acquisitional and comparative findings has been investigated in (Snyder 1995b), where the following hypotheses are proposed:1

(2) a. English complex predicates necessarily form a morphological compound at some abstract level of grammatical representation.
b. The point of grammar that children are acquiring when they suddenly begin producing English complex predicate constructions, is the knowledge that the type of compounding required for complex predicates is available in English.
c. The relevant type of compounding is productive root compounding (or a subtype thereof).

The principal motivation for these hypotheses comes from the literature on complex predicate constructions in two languages closely related to English, namely Dutch and Afrikaans. In Dutch, Neeleman & Weerman (1993; cf. also Neeleman 1994) have observed that the word order possibilities for resultatives and verb-particle combinations are unusually restrictive (3a,b). Similar facts (4a,b) obtain in Afrikaans (LeRoux 1988). Both Neeleman and Le Roux analyze these facts as indicating that complex predicates in Dutch/Afrikaans are morphological compounds.

(3) (Neeleman & Weerman 1993:436)
a. ... dat Jan de deur (vaak) groen (*vaak) verfde.
that John the door (often) green (*often) painted
'...that John often painted the door green.'
b. ... dat Jan het meisje (vaak) op (*vaak) merkte.
that John the girl (often) up (*often) noticed
'...that John noticed the girl.'

(3) (Le Roux 1988:241)
a. Hy sal nie [die antwoorde by my e] kan af + kyk nie.
he will not the answers from me can off look not
'He will not be able to crib from me.'
he will not the answers from me off can look not
'He will not be able to crib from me.'

1 The search for a deeper explanation for the relationship proposed in (2), between compounding and complex predicates, is a major objective in (Snyder 1995a,b), but for reasons of space will not be discussed here.
In English, the possible intervention of the direct object between verb and particle in (1a), and the necessary intervention of the direct object between verb and adjective phrase in (1g), indicates that the verb and its associated predicate do not form a morphological compound at the point of phonological spell-out in English. Nonetheless, English complex predicates could in principle form a morphological compound at either an earlier or a later point in the syntactic derivation, and this is the hypothesis (2a,b) developed and tested in (Snyder 1995b).

More precisely, the hypothesis is that a single point of parametric variation is responsible for the availability, in English, of both productive root compounding and a sizable class of complex-predicate argument structures. Productive root compounding in English is most clearly attested in the form of nominal compounding (e.g. lunch box, student pay review committee), which is productive not only in the sense that large numbers of N-N compounds are found in the English lexicon, but also in the (critically important) sense that English-speakers can and do form novel (non-lexical) N-N compounds at will, with the expectation that such compounds will be immediately accepted as fully grammatical by other English-speakers. In this latter respect English contrasts quite dramatically with French, for example, where a limited number of nominal compounds can be found in the lexicon, but novel N-N compounds, and even semantic extensions of existing, lexical N-N compounds, are perceived as ungrammatical (Bauer 1978), or (at best) as attempts at the introduction of a new coinage.

Given the evidence from Dutch and Afrikaans, suggesting a relationship between complex predicate formation and processes of complex word-formation (compounding), and given the fact that English and French exhibit some of the best-studied contrasts with respect to availability of complex-predicate constructions, the contrast between English and French in the availability of productive (i.e. non-lexical) nominal compounding was hypothesized (2c) to be related to the same point of parametric variation. An assumption implicit to hypothesis (2c) concerns variability in the productivity of English root compounding across different lexical categories (e.g., the fact that N-N compounding is fully productive, while the productivity of P-N compounds, such as off-ramp, is much less certain). If (2c) is correct, then variability across categories in the productivity of "surface" compounding must not carry over to the productivity of the "covert" compounding attributed to English complex predicates, because complex predicate constructions minimally involve a verb, and surface verbal compounding, if productive in English at all, is considerably less so than nominal compounding. At this point we turn to empirical predictions for cross-linguistic variation and the acquisition of English and French. The implications of the hypotheses in (2) for theories of the syntax-morphology interface will be taken up again, albeit briefly, in the conclusions.

1. Predictions and Results for the Acquisition of English

The hypotheses in (2) make strong, testable predictions about the time course of language acquisition in children learning English. Most importantly, the age at which complex predicates are first used productively should correspond very closely to the age at which novel root compounds first come into use. In particular, no child should begin producing novel N-N compounds significantly later than the first complex predicate.

Furthermore, the hypotheses in (2) raise the question of exactly what lexical items participate in the covert compound involved, for example, in a double object dative (where, at least on the surface, there is only a single predicative head), and in resultatives such as (i), where the AP contains modifiers.

(i) John painted the house bright red with green stripes.

For discussion of these questions, see (Snyder 1995a,b).
constructions.\textsuperscript{3} This prediction was tested in (Snyder 1995b) using the spontaneous production data for ten children from the CHILDES database (MacWhinney & Snow 1985, 1990). For each child, the age of acquisition (measured as first clear, non-imitative use) was determined for each of the complex-predicate constructions (1b-g) that had been examined in (Snyder & Stromswold 1997). In addition, the age of first clear, non-imitative use of a novel N-N compound was determined for each child. The results for verb-particle constructions are representative, and are illustrated in Table 1.

Table 1. First verb-particle combination (x-axis) v. first N-N compound (y-axis), with ages in years.

The age of first clear use of a verb-particle combination (as well as the other complex predicate constructions examined) was extremely well correlated with age of first clear use of a novel (i.e. non-lexical) N-N compound. The correlation illustrated in Table 1 is robustly significant by linear regression test ($r = .98$, $t(8) = 12.9$, $p < .00005$), and remains statistically significant even when the variance attributable to various measures of general linguistic development (e.g. the age at which Mean Length of Utterance first exceeded 2.5 morphemes) has been removed by partial regression. Moreover, the ages of acquisition for N-N compounds and verb-particle combinations are not merely correlated, in the

\textsuperscript{3} Productive N-N compounding will be taken as the principal diagnostic for availability of productive root compounding more generally, given that other types of root compounding, at least in English, are to varying degrees more restricted. We expect, in other words, that N-N compounding will be the most sensitive indicator of whether root compounding of any sort is available as a productive option in the grammar. Furthermore, we expect that little if anything beyond the availability of productive root compounding is necessary for the child to begin producing N-N compounds, whereas complex predicate constructions require, to varying degrees, additional lexical and syntactic knowledge. Hence, we do not necessarily predict that every child learning English will begin producing complex predicate constructions at precisely the same age as novel N-N compounds, but we do predict that no child should acquire N-N compounding significantly later than the first complex predicate constructions.
statistical sense, but are very nearly identical for every child studied. The hypotheses in (2) are therefore strongly supported by the evidence from children's acquisition of English.

2. Predictions and Results for Cross-linguistic Variation:

The hypotheses in (2) also make strong predictions about patterns of cross-linguistic variation. In particular, if a single point of variation determines the general availability of both root compounding and complex-predicate formation (in at least the sense exemplified by the constructions in 1), then we predict that cross-linguistically, a given language should exhibit complex-predicate formation of the English type (e.g. the resultative, lg) if and only if it exhibits productive ("non-lexical") root compounding. N-N compounding will once again be chosen as the principal diagnostic for the more general availability of productive root compounding, on the grounds that at least in English, it is the most fully productive form of root compounding, and is therefore plausibly the most sensitive measure in other languages as well. We are not at present aware of any language that allows productive, but exclusively non-nominal, root compounding.

A cross-linguistic survey testing the above prediction for resultatives and novel N-N compounds was initiated in (Snyder 1995b), and new judgements from linguistic informants continue to be collected. The most current findings for the languages discussed in (Snyder 1995b) are presented in Table 2. A number of uncertainties are indicated in Table 2 by question marks. For example, Japanese appears to allow productive N-N compounding, but there exist some indications that it may be a more restricted grammatical option than in English. Furthermore, Hebrew and Arabic allow construct-state constructions, which resemble genitival-modifier constructions, and are normally distinguished from the (unproductive) N-N compounds in these languages (cf. Ritter 1991), but nonetheless share certain properties with N-N compounds (cf. Borer 1988). Two languages, Mandarin Chinese and American Sign Language (ASL) have been excluded altogether from Table 2, because of difficulties in evaluating whether their "resultative" constructions are comparable in relevant respects to that of English, and also because of difficulties in evaluating whether nominal compounding in Mandarin is fully productive for present-day native speakers.

An obvious difficulty is how to determine membership of a given grammatical construction in the relevant class of complex predicate constructions, given that the term "complex predicate construction" has been applied in a variety of ways by different researchers working on different languages. Moreover, this terminological ambiguity reflects real theoretical uncertainty, because even if one adopts a strictly Larsonian approach (which itself is actively debated), the syntactic analysis of candidate "complex predicates" has to be argued on a case-by-case basis. To render these difficulties more tractable, the grammaticality of an English-style resultative construction is proposed in (Snyder 1995b) as perhaps the best available, cross-linguistically applicable diagnostic for the grammatical possibility of "complex-predicate formation" in the sense of (Larson 1988a,b). Even this diagnostic, however, must be applied carefully; in the case of Korean, independent properties of the language render an English-style resultative impossible, and the availability of complex-predicate formation (in a Larsonian sense) has to be argued on different grounds.

Despite the conflicting reports from different linguistic consultants, the preponderance of available evidence certainly suggests that present-day Mandarin does have productive nominal compounding. Also, differences between the English and Mandarin resultative constructions are plausibly attributed to independent characteristics of Mandarin, rather than a lack of Larsonian complex-predicate formation. Evidence from Mandarin verb-particle and double-object constructions, in particular, lends support to such a view. In the case of ASL, there is relatively little evidence for productive nominal compounding, but disagreements exist as to which informants are properly viewed as native signers, and this clouds the issue to some degree. Furthermore, ASL expresses the meaning of an English resultative with a construction that is superficially ambiguous between a complex predicate and a bi-clausal structure; the proper categorization of ASL will therefore require further investigation.
Table 2. Main results of cross-linguistic survey.

<table>
<thead>
<tr>
<th>Resultatives</th>
<th>Novel N-N Compounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>YES</td>
</tr>
<tr>
<td>Dutch</td>
<td>YES</td>
</tr>
<tr>
<td>German</td>
<td>YES</td>
</tr>
<tr>
<td>Hungarian</td>
<td>YES</td>
</tr>
<tr>
<td>Kluner</td>
<td>YES</td>
</tr>
<tr>
<td>Japanese</td>
<td>YES?</td>
</tr>
<tr>
<td>Korean</td>
<td>N/A</td>
</tr>
<tr>
<td>French</td>
<td>NO</td>
</tr>
<tr>
<td>Spanish</td>
<td>NO</td>
</tr>
<tr>
<td>Russian</td>
<td>NO</td>
</tr>
<tr>
<td>Serbo-Croatian</td>
<td>NO</td>
</tr>
<tr>
<td>Hebrew</td>
<td>NO?</td>
</tr>
<tr>
<td>Arabic (Palestinian)</td>
<td>NO?</td>
</tr>
</tbody>
</table>

Thus, while the evidence in Table 2 is overwhelmingly consistent with the predictions of the hypotheses in (2), a general problem is indicated: How can we judge whether surface constructions in different languages are grammatically equivalent? This issue is central not only to the present project, but quite generally to research on the grammatical basis of cross-linguistic variation. One possible approach to the question, in our view, is to combine the standard informant data employed in comparative syntax with cross-linguistic acquisitional evidence. This approach is illustrated in the following section.

3. Predictions for the Acquisition of French

As discussed above, there is considerable comparative evidence indicating that French lacks any direct syntactic counterpart to the English resultative, verb-particle construction, or make-causative, and also that French lacks productive nominal compounding. Yet, there is some ambiguity as to whether French lacks all types of "Larsonian" complex-predicate formation. First, a number of the constructions in (1) do have apparent counterparts in French. For example, the English put-locative corresponds reasonably well, at first glance, to the French mettre-locative construction. Second, French has several constructions that correspond semantically to English complex predicates, and moreover exhibit properties of morphological word-formation, but are not directly comparable in their syntactic characteristics to the corresponding English complex predicates. Specifically, the French faire-causative corresponds semantically to the English make-causative, and has been analyzed (den Dikken 1990) as involving morphological compound-formation (i.e. of faire with another verb). Additionally, French has a sizable number of prepositional-prefix verbs (e.g. di Scullo 1994, in press) that correspond semantically to English verb-particle combinations. In principle, the French verb and its prefix could combine in a manner comparable to the "covert compound-formation" suggested above for the English verb-particle combination (and other complex predicates).

A further point of possible similarity between English and French is the availability in French of a highly productive N-de-N construction (e.g. jouet de bébé 'baby toy') that is a close semantic counterpart to the N-N compounding of English. While the French construction is not obviously a case of morphological root compounding, especially considering the obligatory presence of the genitive-marker de (or in some cases...
the "connecting" preposition à), one could perhaps speculate that the typical absence of a
determiner in the modifier (e.g. tasse de thé, *tasse du thé = 'cup of-the tea') reflects a
morphological requirement of some type, given that the modifiers in English nominal
compounds are also overwhelmingly bare, indefinite nouns.

A possible source of guidance is evidence from children's acquisition of French. In
general, we do not expect to be able to tell from acquisition data whether two
constructions in different languages are equivalent, but if we tentatively accept the
hypotheses in (2), and assume that some subset of complex-predicate constructions do
have a special acquisitional relationship to morphological compounding, then we can use
cross-linguistic acquisitional data to further restrict this hypothesis. For French, two
principal cases should be considered. First, it is possible that the French N-de-N
constructions qualify as root compounds in the relevant sense. In this case we predict
from (2) that the French candidates for "complex predicate" status are in fact complex
predicates in the relevant sense, and children learning French should acquire N-de-N
constructions at approximately the same age as these complex predicates. In particular,
no French child should acquire N-de-N constructions significantly later than the complex
predicates.

If this prediction is supported by the acquisitional evidence, then we will be led to
refine the hypotheses in (2) so that N-de-N constructions and faire-causatives, for
example, are clearly included among the relevant cases of complex-word formation and
complex-predicate formation. Alternatively, it is possible that the French candidates for
"root compound" status are not in fact root compounds in the relevant sense, and then the
hypotheses in (2) lead us to expect that, in the general case, children learning French will
acquire N-de-N constructions at significantly different ages than the putative complex
predicates.

To test these predictions, we performed a case-study using the longitudinal
corpus of spontaneous production data for a single child, Philippe (Suppes, Smith, &
Léveillé 1973). Philippe's transcripts were hand-searched in chronological order, until we
located the point where Philippe was regularly producing clear uses of the faire-causative,
the mettre-locative, and prepositional prefix verbs (in the sense of di Sciullo 1994), and
producing clear, novel (i.e. innovative) uses of the N-de-N construction. In addition,
Philippe's later transcripts (transcripts 12-22) were hand-searched for all clear uses of the
faire-causative, and all novel uses of the N-de-N construction, to obtain an estimate of
their relative frequency when both were clearly permitted by Philippe's grammar.
Philippe's earliest clear uses of faire-causatives and N-de-N constructions are provided in
Tables 3 and 4.6

Table 3. First clear uses of faire-causative.

| Phil 03: | 2;2.3 | c'est dur faire rouler tout seul la voiture |
| Phil 04: | 2;2.10 | faire tourner comme c'est la montre |
| Phil 08: | 2;3.7 | fait rouler les voitures dans le jardin |
|         |       | fais rentrer la chaise |

6 Both the mettre-locative and the prepositional-prefix verbs of French were attested in Philippe's earliest
data, prior to his first faire-causative. In the discussion below we choose to focus on the causative, because
this is the candidate complex predicate acquired most nearly at the same time as the N-de-N construction.
Yet, as will be seen below, the N-de-N construction is acquired still later than the causative.
Table 4. First clear, innovative uses of N-de-N.

| Phil 12: 2;6.20 | un volant de voiture | "de voiture" is redundant, and therefore probably Ph.'s innovation |
| Phil 14: 2;7.11 | une tête de bonhomme | |
| Phil 17: 2;8.1 | le wagon à gue | "crane car", apparently referring to a train-car (actually a tractor functioning as part of Philippe's train?) with a crane attached |
| Phil 19: 2;8.15 | un livre de renard | "a fox-book"; father converts "de" to "du" (full PP), suggesting that the original form was Ph.'s innovation |
| Phil 20: 2;8.22 | une locomotive de bébé | "a baby locomotive", on model of "des jouets de bébé", but apparently novel |
| Phil 24: 2;10.17 | des bateaux de crocodile | describing pictures of boats on his beadspread; Ph. uses "crocodile boats" for one type of boat; Mad. requests explanation, but gets none |

The main point to observe is that Philippe demonstrates productive use of both N-de-N and faire-causatives in his corpus, but N-de-N is acquired substantially later than faire-causatives. The first N-de-N construction follows the first clear use of a causative by approximately 4 months, and during these intervening months approximately ten hours' worth of Philippe's speech was included in the corpus. Moreover, Philippe employed some 11 clear uses of the causative prior to his first N-de-N construction. To calculate the probability of obtaining this pattern of results simply by chance, if the two constructions in fact became available in Philippe's grammar simultaneously, we need information about the relative frequency of the two constructions in Philippe's speech at a point when both constructions were clearly available in his grammar. Our analysis of
Philippe's later transcripts (tr.12-22) yielded a relative frequency of 2:1 precisely: 12 faire-causatives versus 6 novel N-de-N constructions. The probability of obtaining 11 uses of the causative before the first clear use of a N-de-N construction, simply by chance, is then given (by a two-tailed modified sign test) as \( p < .012 \), and the observed effect is therefore statistically significant.

Our case study of Philippe, though dependent on the data of a single child, yielded a clear result: Children learning French do not necessarily acquire the N-de-N construction as early as they acquire the putative complex predicate constructions examined. Thus, by the reasoning discussed above, our findings indicate that the hypotheses in (2) should be refined so as clearly to exclude the N-de-N construction from the relevant processes of root compounding, and so as clearly to exclude the French faire-causative, mettre-locative, and prepositional-prefix verbs from the class of complex predicate constructions that are rendered available by the proposed parameter.

4. Conclusions

Taken together with the acquisition data for English, the French data support the following conclusions. First, the acquisitional phenomenon observed in English is language-particular, as it does not hold true for French. Accordingly, the phenomenon cannot be attributed to maturational factors, for example, but instead clearly relates to the acquisition of a language-particular property of English. Second, the evidence from French allows us to refine the hypotheses in (2). The French N-de-N construction must not be a case of "root compounding" in the sense that is relevant in explaining the English acquisition data. Most probably, "root compounding" should be taken to exclude compounds dependent on any "connector" element such as de, and perhaps also compounds that are formally possessive (cf. Semitic construct states).

Finally, to the extent that the hypotheses in (2) continue to be supported by the acquisitional and comparative data, there are two immediate implications for theories of the syntax-morphology interface: First, the analysis of complex predicates as involving compounds, with subparts visible to the syntax, is problematic for stronger versions of the Lexicalist Hypothesis, but is central to the proposals in (2). The English complex predicate constructions in (1) do not plausibly contain a compound on the surface, and therefore any operation of compounding involved must apply either prior to phonological spell-out, with the components of the compound then becoming separated by syntactic movement operations (cf. Neeleman 1994 on Dutch V2 with complex predicates), or after phonological spell-out, with the elements of the compound being brought together by covert movement operations (cf. Baker 1988, and much subsequent work, on syntactic incorporation). In neither case can the subparts of the compound be invisible to operations of the syntax. Second, the existence of a point of parametric variation (productivity of root compounding) that is both directly relevant to cross-linguistic variation in syntax, and (apparently) irreducible to the properties of any single closed-class lexical item, is problematic for attempts to reduce all syntactic variation to "lexical properties" in the strictest sense of the term, although general parameters of compounding are still perhaps "lexical" in a broader sense.

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ON THE SYNTAX-MORPHOLOGY INTERFACE IN ACQUISITION 423


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