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Susannah Levi
Jennifer Loveless

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Table of Contents

Errata

There was a numbering error involving our two previous volumes of University of Washington Working Papers in Linguistics. The 1998 annual edition was published as Volume 16, which is correct.

However, a supplemental edition entitled "Ronga Linguistics" published in May, 1999 was also numbered Volume 16. This special edition should have been Volume 17.

Accordingly, the current publication is Volume 18.

We regret any inconvenience this may have caused.

Acknowledgments

Licensing arguments of N without inherent case

Victor J. Eskenazi

vesken@u.washington.edu

1. Introduction

Nominal complements of N have generally been assumed to be licensed by inherent case (see Chomsky (1986)). Under this conception, N assigns case to the complement in situ, relieving it of the need to raise to a case-marked position. This difference between N and structural case-assigners T and V correlates nicely with the apparent nonexistence of NP movement within NP (e.g., Raising, ECM, and Passive). However, Chomsky's (1995) minimalist framework introduces numerous technical innovations that lead us to reexamine the theory of inherent case with respect to N; reevaluation is also needed in light of the work on the internal syntax of DP, initiated by Abney (1987). In accordance with this goal, I present evidence in this paper showing that a certain amount of functional structure is required to license complements of N. In particular, I propose that complements of N can be assigned structural case in either [spec, DP] or [spec, NumP], just as direct objects can be assigned either nominative or accusative case in the specifier of IP or AgrOP, respectively (some arguments for NumP appear in Li (1998), Ritter (1995) and references cited there). From a theoretical perspective, this runs counter to previous analyses of "*of*-insertion" (Chomsky (1986a)), claiming instead that case assignment in DP is analogous to that in clauses: structural and inherent case are assigned in both domains.

The evidence for this claim comes from two kinds of phenomena. First, noun complements are prohibited in manner PP constructions such as *via interpreter*; objects of *via* and *by* may not contain D or Num and have several other unusual properties (described in the next section). These properties follow from the assumption that the prepositions *by* and *via* c-select NP, given Longobardi's (1994) theory of the referential function of D and the possible positions of modifiers in DP. Taken along with our assumptions concerning the case-assigning property of Num, the c-selection analysis will also account for (4) and (5), which poses a serious challenge to the standard inherent case account. Second, I will show that in examples from

Turkish, Korean and Chinese, the noun complement must raise out of NP for case; if the complement remains in situ, the result is an ungrammatical sentence. This behavior is totally unexpected on the view that N assigns inherent case.

2. Theoretical problems with the inherent case account

Before moving on to a discussion of the empirical problems for the inherent case account, there are some strong theoretical reasons to look for a better analysis. First of all, consider the pair in (1):

(1)   the city's destruction (= the destruction of the city)

        yesterday's destruction (≠ the destruction of yesterday)

Chomsky's theory has the unfortunate consequence of having to say that both possessors, *city's* and *yesterday's*, are assigned inherent Case (and hence theta-marked) by *destruction*. This is clearly off the mark in the latter case. Our approach offers a more satisfying account of the cases in (1), by claiming that both possessors, *city's* and *yesterday's*, are assigned structural Case. The analysis makes no particular commitment to theta relations that hold between *destruction* and its possessor.

Secondly, one very robust fact about verbs is that they only assign inherent/lexical case to their internal arguments. Further, to my knowledge, there are no examples in which more than one argument of the verb is marked with inherent case. Thus, even if we were to assume that external arguments could be assigned a theta role by the verb (which itself is controversial), inherent case would somehow have to be linked to only those theta roles that get assigned to internal arguments. However, consider the following example:

(2)   John's description of the facts

John is the agent in the describing event, an external argument (or not an argument of the noun at all (see Grimshaw (1990)). On Chomsky's theory, both *John* and *facts* are inherently case-marked; (2) would then be an example where a noun not only assigns inherent case to an external

argument, but also assigns inherent case to more than one argument. Neither of these possibilities is attested in the verbal domain, and there is little reason to extend the notion of inherent case to cover the nominal domain, save the need to explain how possessors and noun complements are licensed.

The idea of using inherent case to license *all* arguments of N arose prior to the DP hypothesis, and prior to the current trend of positing functional heads (e.g., AgrO, AgrS, Asp, Voice) that play a central role in licensing arguments. Given this backdrop, it is natural that some addition to Case theory was devised for the NP domain, but in a minimalist framework, it is unnecessary to maintain this mechanism for licensing arguments of N. The minimalist program would also appear to make the Case Filter obsolete; if DPs only raise to satisfy the requirements of functional heads (Tense being the prime example), can't we assume that arguments of N remain in situ because there are no functional heads within DP analogous to Tense? Perhaps D and Num have no features to check with arguments of N.

This is an empirical question, and as we will see in sections 3 and 5, there are strong empirical reasons to license arguments of N by checking features in spec of DP and NumP.

3. Syntactic properties of bare singulars

Singular count nouns must be accompanied by some sort of determiner in English:

(3)   Larry placed *(the) book on the table.
(4)   Sam is considered *(a) genius by his friends.

This requirement holds both for nominal arguments (3), and predicates (4). There are, however, a number of exceptions to the generalization expressed above:

Objects of manner PPs

(5)   Frank usually commutes by *train*.
(6)   The papers were sent via *messenger*.

Profession-class predicates

(7)   Nader was appointed *campaign-reform czar.*

Vocatives and appositives

(8)   Ok, *genius,* tell us how to do it.

Synthetic Compounds

(9)   Sandy doesn't much like *potato* peeling.

We'll begin by looking at the properties of just the bare singulars in synthetic compounds and *by-* and *via-*PPs, returning later to the cases in (7-8), which have somewhat different properties. The first thing to notice is that the bare singulars in these constructions cannot be modified:

(10)   He arrived by plane (*with four engines).
(11)   The papers arrived via (*speedy) messenger.
(12)   Each part was built by machine (*that no longer exists).
(13)   Miles is a book (*about whales)-collector (*about whales)

It is possible to have a full DP after *via,* subject to certain semantic restrictions (cf. (17)):

(14)   We heard, via rumor (*about John), that his mother is having an affair.
(15)   ?We heard, via a particularly nasty rumor about John, that his mother is having an affair.
(16)   ?We heard, via Sean's nasty rumor about John, that…
(17)   Nigel usually commutes via train/the morning train/*this train/??one of these trains.

Crucially, the PP modifier *about if John* is only acceptable accompanied by a determiner or possessor, as in (15,16).[1]

Next, note that it is impossible for any sort of bare noun to have an overt complement:

(18) Clinton communicated with the African leaders via eight interpreters of different Bantu languages.

(19) *Clinton communicated with the African leader via interpreter of Chichewa.

(20) Geoff is a convention observer (*of linguists).

    (cf. Geoff is an observer of conventions of linguists).

The postnominal PP in (18) differs from that in (15) with respect to the *'one* rule':

(21) I heard a rumor about Bob and he heard one about me.

(22) *I met an interpreter of English and she met one of Chinese.

This rule is known to apply to a constituent smaller than QP (consider, for example, *each one*, *every one*) but at least as big as NP (hence *one* replaces N and any true complement within N'). What this suggests is that the PPs in (18) and (22) are true complements, while those in (15) and (21) are actually modifiers.

The next fact about bare singulars concerns their referentiality: they cannot serve as the antecedent of a pronoun (the # below is meant to signify that an anaphoric relation between N and pronoun can only be established via accommodation).

(23) Max commuted by bus_i yesterday. #It_i was filthy.

(24) The contract arrived via $messenger_i$. #His_i name was Ted.

(25) Marty is $potato_i$-peeling at the moment. #It_i's a big one.

However, examples like (23) and (24) improve when the generic reading of the bare noun is emphasized:

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[1] Note that none of the properties below hold of bare plurals and mass nouns; I assume this reflects the

(26)   Max always commutes by train, because they're cleaner than buses.

(27)   Many who claim to have flown by lear jet$_i$ have never even seen one$_i$.

This suggests that bare singulars in manner PPs can denote a kind (and perhaps must in the case of *by*-PPs).

It is also true of bare singulars that they resist extraction:

(28)   *What$_i$ does Fred commute by t$_i$?

(29)   *Fax$_i$, I like to send important papers via t$_i$.

(30)   *By what$_i$ do you usually travel t$_i$?

We might conclude from (28) that the object of *by* can't be moved via A'-movement, but (30) suggests that *what* may be incapable of substituting for the bare singular noun, though at this point it's unclear why.

4.0 Potential analyses

In the next three sections, we will consider some potential analyses of the data in (10-30).

4.1 Evidence that by-PPs aren't lexically derived

The properties discussed above would be expected if phrases like *by train* were composed in the lexicon. Indeed, similar-looking phrases, such as *by heart* and *off hand,* do seem to be frozen expressions. There are some good reasons, though, to doubt this proposal.

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presence of an empty determiner, as argued by Longobardi (1994).

First, these bare objects can be conjoined:

(31) To be sure the news was received, we sent it by both e-mail and snail mail.

(32) He always commutes by either [train or bus].

(cf. *Dole's frequent use of off [hand and color] remarks ended up hurting him.)

If the *by*-PP in (31) were lexically derived, it would be predicted to be ungrammatical, under the standard assumption that conjunctions only operate on syntactic constituents. Just as important, (31) and (32) are evidence against generating *by train* via (overt) syntactic incorporation: this theory would require adjacency between *by* and the bare N object, which is clearly not what happens in (31, 32).[2]

Secondly, these manner PPs are completely productive: any new form of transportation or communication can appear in this construction, which contrasts with some similar looking PPs which are definitely lexically-frozen expressions.

(33) *sent by fax, travel by lear jet, transmitted via satellite*

(34) **play a song by artificial heart/pig heart*

One last bit of evidence against the lexical approach comes from the contrast below:

(35) Many who fly by lear jet$_i$ today wouldn't have flown by one$_i$ 20 years ago.

(36) *Anyone who can play Mozart by heart$_i$ can play Beethoven by one$_i$ too.

The lexical approach leads us to expect an anaphoric island effect for both (35) and (36), but only the latter, which contains the frozen PP, bears this prediction out.

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[2] To avoid any uncertainty over lexical versus syntactic origin, I have been ignoring a large class of other PPs containing bare singulars (over budget, up to code, on alert, on target, on demand, etc.), which seem less productive than by?PPs, but certainly more transparent in meaning than by rote.

4.2 The c-selection analysis

A rather direct way of accounting for the data is to claim that *by* c-selects a bare NP, and *via*, either NP or a DP. This analysis succeeds in accounting for most of the observed properties of manner PPs. The impossibility of modifying bare singulars is predicted, if Longobardi (1994) and others are right in attaching attributive adjectives in the functional structure between D and NP; heavier modifiers such as PPs and relative clause are presumably right-adjoined to the same functional structure.

(37)   [DP D [#P [Adj [#P [#P # [NP N (complements)]] PP/RelClause]]]]

The analysis also predicts that bare singulars (=NPs) cannot serve as antecedents, assuming D to be the locus of reference (alternatively, we could assume that #P is the minimal amount of structure required for supplying a pronoun with an antecedent). The absence of a #P might also explain why **commute by trains* is ungrammatical, since #P is arguably required to morphologically express the plural. Further, the bare singular in *by train is* semantically unspecified for number (when one commutes by train, any number of trains might be involved). If Number is an interpretable feature and bare NPs lack this feature, then this semantic property of by train is expected under our analysis.

A c-selection analysis has been proposed by Longobardi (1996) for a similar set of facts in Italian. As in English, arguments in Italian generally require a determiner; (38) shows that this goes for objects of prepositions as well (Longobardi's examples):

(38)   *Gianni é a giardino/ufficio/treno.
       Gianni is at garden/office/train

(39)   Gianni é in giardino/ufficio/treno.
       Gianni is in garden/office/train

(39) represents an exception: the preposition *in,* like English *by* and *via,* allows a bare singular object. As seen in (40), *in* also allows DP (like *via*), and in this case, possessors and modifiers

are licensed; crucially, though, it is not possible to have a possessor or modifier in (41), where a bare NP is selected:

(40) Gianni é nel giardino pubblico/di Maria.
      Gianni is in-the garden public/of Maria
(41) *Gianni é in giardino pubblico/di Maria.
      Gianni is in garden public/of Maria

Given Longobardi's assumption that adjectives and possessors appear between D and NP, (41) is ungrammatical because there is no determiner position to for N raise to (and, in fact, the functional structure for the adjective and possessor is also missing). Longobardi (1994) suggests that modifiers of all kinds require the presence of a determiner, and an empty determiner is not an option here, since these, he assumes, are restricted to mass nouns and bare plurals.

   C-selection of NP leads to the prediction that the object of *in* should itself be able to take an overt complement. Longobardi doesn't give examples of this, and it turns out to be too difficult to construct plausible examples with *in*. However, the facts from English ((18-20) above) show that the prediction is incorrect:

(19)   *Clinton communicated with the African leader via interpreter of Chichewa.
(19') Clinton communicated with the African leader via an interpreter of Chichewa.

In order to express what (19) is trying to say, an overt determiner is required, as in (19').

   What we lack at this point is a real explanation of why complements and modifiers of N require the presence of a determiner; in other words, what rules out structures like (19) below? Ideally, this explanation should also account for the other unexplained properties of bare singulars observed in (10-20).

(19)   PP
                    ⟋‾‾‾⟍
              P   NP
              via   ⟋‾‾‾‾⟍
                   N   PP
              interpreter   ⟋‾‾⟍
                         of Ancient Egyptian
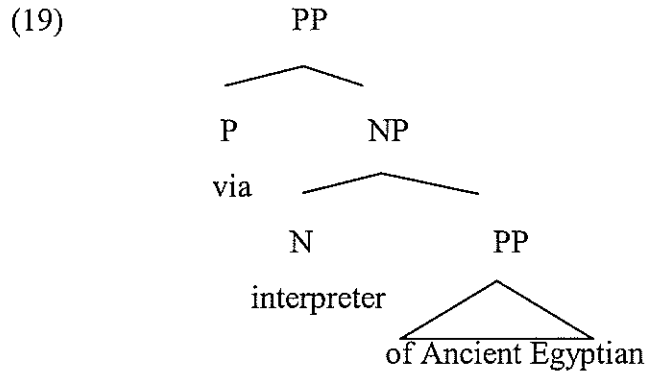
5.0 Licensing complements of N

The issue of how nominal complements of N are licensed is a particularly murky one. Chomsky (1995, Chapter 1) proposes that N and A assign inherent genitive case to their complements; how this translates into checking theory is far from clear. I want to propose here that complements of N are not assigned inherent Case, but structural Case. Thus, in parallel with verbal arguments, they must raise to the specifier of some functional projection, either by Spell-out or LF. Within the Minimalist framework, the entire issue of inherent case has been left unresolved; indeed, the old conception of inherent case can't be easily integrated into a feature checking framework such as the MP.

Aside from the problems this raises within the Minimalist framework, we should question the validity of extending what is generally meant by inherent Case (i.e., Case associated with a specific theta role) to N complements. While just a small subset of verbs assign inherent Case, all deverbal nouns are standardly assumed to only assign inherent Case; yet the internal theta role assigned by *solution* and *solver*, for example, is presumably no different than the one assigned by *solve* (which assigns structural, not inherent case). Therefore there is no reason to suppose that inherent Case plays any part in licensing N complements in such instances. Parallelism among the lexical categories was the major insight behind X-bar theory in Chomsky's *Remarks on Nominalizations*. Thus the standard account of casemarking complements of N represents an unjustified departure from Chomsky's earlier insight.

5.1 Crosslinguistic Considerations

Assuming for the present that N complements do have to raise for feature checking, we'd expect to find some languages that meet this requirement in overt syntax, and others that do it in LF. The question then is, can we find examples of the complement raising above N to [spec,FP]? There is evidence for this in languages such as Chinese, Korean and Turkish:

(42)   [$_{NumP}$ [Na-sho sh]$_i$ huanmiou te   [$_{NP}$ chieshi t$_i$]]   pei tueihuai.
       that-CL   poem ridiculous Gen interpretation Psv rejected
       'A ridiculous interpretation of that poem was rejected.'   (Chinese)

(43)   Elton John-eyuyhan [nolay-uy]$_i$ say [$_{NP}$ t$_i$ chuyip-un] sengkongecki-et-ta.
       Elton John-by   song-Gen new   recording-Top   successful-Past-Ind
       'Elton John's new recording of the song was successful.'   (Korean)

(44)   Hasan-in [benim komputer-i] yeni calinma-si
       Hasan-Gen my computer-3sg recent theft-3sg
       'Hasan's recent theft of my computer'   (Turkish)

As the word order in these examples suggests, the DP complement of the N raises to a position between N and D. The position of the adjective rules out the possibility that the complement is base-generated to the left of N. It is also notable that in Chinese and Korean, the complement cannot appear between the adjective and N. In Turkish, the order [Adj Comp N] is possible, but only if the adjective is understood as modifying the complement 'computer', not the selecting noun 'theft':

(42') *Huanmiou te [$_{NP}$ chieshi   na-sho   sh]   pei tueihuai.
       ridiculous Gen   interpretation that-CL   poem Psv rejected
       (same meaning as (42))   (Chinese)

(43')   *Elton John-eyuyhan say [$_{NP}$ nolay-uy]$_i$ chuyip-un]   sengkongecki-et-ta.

       Elton John-by   new song-Gen   recording-Top   successful-Past-Ind

       'Elton John's new recording of the song was successful.'   (Korean)

(44')   Hasan-in [yeni komputer-i] calinma-si

       Hasan-Gen recent computer-3sg theft-3sg

       #'Hasan's theft of the recent computer'   (Turkish)[3]

This suggests that the complement of N must overtly raise over the adjective to some specifier position. I propose, then, that the structure of the DP in (44) is the following:
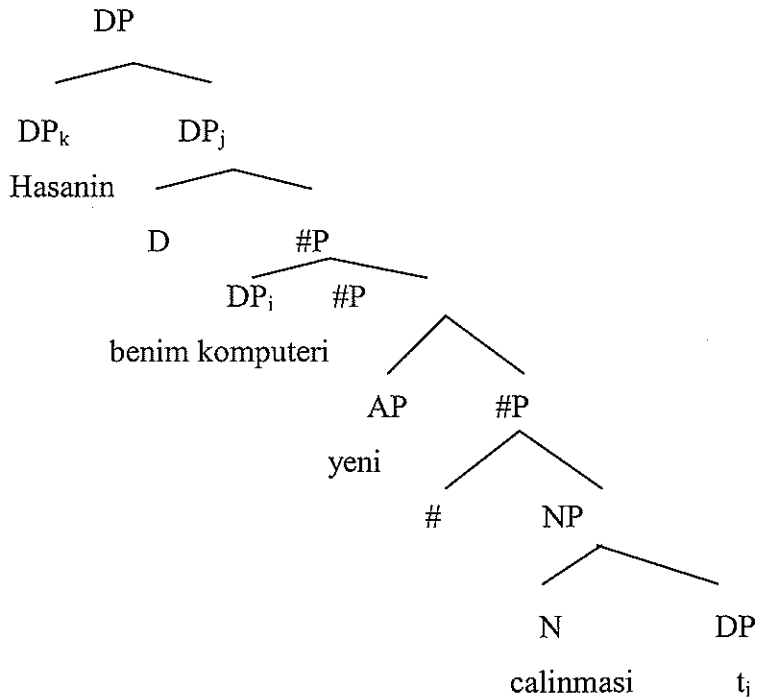
Now let us consider what happens when, for whatever reason, there are no functional projections above N. As argued in Longobardi (1994), referential arguments have two ways of being licensed: either by incorporation into another lexical head, such as V or P, or by N raising to D. Since we are considering arguments with no functional structure, that means the only possibility

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[3] I would like to thank my informants, Soowon Kim (Korean), Chia-hui Huang (Chinese), and Dilara Blake (Turkish).

for licensing would be N to V/P incorporation. The consequence of these assumptions is that if a noun appears in a structure lacking #P and DP, then any referential argument of that N cannot be licensed. The implication goes as follows:

(45)   If N has a complement, #P is required above N.

       If there is such a #P, there must also be a DP.

The claim that there cannot be a #P without DP is based on the assumption that # would block incorporation of N into a higher lexical head, leaving only one other option for licensing N, namely raising to D. The intuition here is that lexical heads can move through other heads within their own extended projection for feature checking, but incorporation is a more restricted process, in that nouns can only incorporate into other lexical heads. The intuition has been codified as the Proper Head Movement Generalization (see Baker (1995: 284) for discussion):

Proper Head Movement Generalization
A lexical category cannot move into a functional category and then back into a lexical one.

The implication in (45) requires some qualification: we haven't yet discussed measure phrases (e.g., [The book weighs *five pounds*]), which I assume to be bare #Ps. Since these are non-referential, there is arguably no DP present, and the noun apparently doesn't incorporate, given the possible presence of numerals. I will assume that it is a special property of #Ps that they can be interpreted as measure phrases, and that this method of interpretation is distinct from the method utilized for both referential arguments and bare NP predicates. It is then predicted under our analysis that measure phrases, as #Ps, may be modified (the nouns are typically not complement takers, i.e., not derived from verbs). Although semantic situations involving modification of MPs are often implausible, there are limited examples of modification (e.g., *He ran five long miles*).

To summarize this section, we've argued that complements of N are not assigned inherent Case, but structural Case, which is checked in the specifier of #P. We examined evidence from Turkish which suggested that raising of the complement can occur in overt syntax, in contrast to English, which takes place during the computation to LF. This theory of

licensing in DP provides an answer to the puzzle concerning complements of objects of *by* and *via* PPs (see (18, 19)), and gives a more principled account of *of*-insertion, i.e., one that treats verbs and the nouns derived from them in a similar fashion.

6. Licensing arguments in derived nominals and gerunds

It has been a long-standing puzzle why Raising in derived nominals is ungrammatical:

(46)   *This led to John's appearance to have won.

(47)   This led to the appearance that John had won.

(48)   *John$_i$'s belief [t$_i$ to be intelligent]

(49)   the belief that John is intelligent

(50)   John$_i$ is believed [t$_i$ to be intelligent].

There is nothing wrong with (46) semantically, as the paraphrase in (47) shows. Similarly, we might expect (48) to be as acceptable as (49), given the grammaticality of the sentential equivalent in (50).

One approach to (46), going back to Ross, is that movement out of N complements leads to illformedness. In somewhat more formal terms, we can assume that the IP complement of N constitutes a barrier to movement, for reasons having to do with what is sometimes referred to in the literature as the "inherent defective nature of N." Chomsky (1986:36) suggests that N is not a proper governor. Grimshaw (1990) and Cinque (1990) both propose that N is a defective theta marker; for Cinque, the notion 'barrier' is defined as an XP "that fails to be directly selected by a category nondistinct from [+V]" (p. 55), which has the consequence that complements of N are always barriers.

If the IP complement of N in (46) and (48) is a barrier, we expect A-movement across this IP to lead to strong ungrammaticalty (an ECP violation), since A-movement is subject to stricter locality constraints than X-movement. Here, let us follow Rizzi's (1990) view that every link in an A-chain requires antecedent government, which depends on there being no barriers and no potential landing sites between the head and tail of the chain. A'-chains, on the other hand, only suffer subjacency effects when an argument crosses a barrier.

Now consider another difficult puzzle about derived nominals:

(51) *The appearance of John to win
(52) *Mary's belief (of) John to be intelligent
(53) *The belief of John to be intelligent

The impossibility of *of*-insertion in contexts like (52) is unexpected; this example would not seem to involve raising out of IP, and these nouns trigger *of*-insertion in other contexts (I am grateful to Kyle Johnson for pointing out the significance of these two puzzles to me). The standard account of (51-53) proposes that *of* realizes inherent Case, which is only assigned to an argument of N, not *John*, the subject of *win*. This certainly doesn't follow from anything outside the theory of *of*-insertion.

Under our current assumptions, we can explain the phenomena in (51-53) just as we explained (48); in (52), *John* must raise to [spec,#P] for Case in LF. This means *John* must cross an IP barrier on its way to a Case position:

(53)

```
              DP
            /    \
         DP       DP
        Mary's   /  \
                D    #P
                    /   \
                   #     NP
                        /   \
                       N     IP
                     belief  / \
                            /   \
                           /_____\
                   (of) John to be intelligent
```
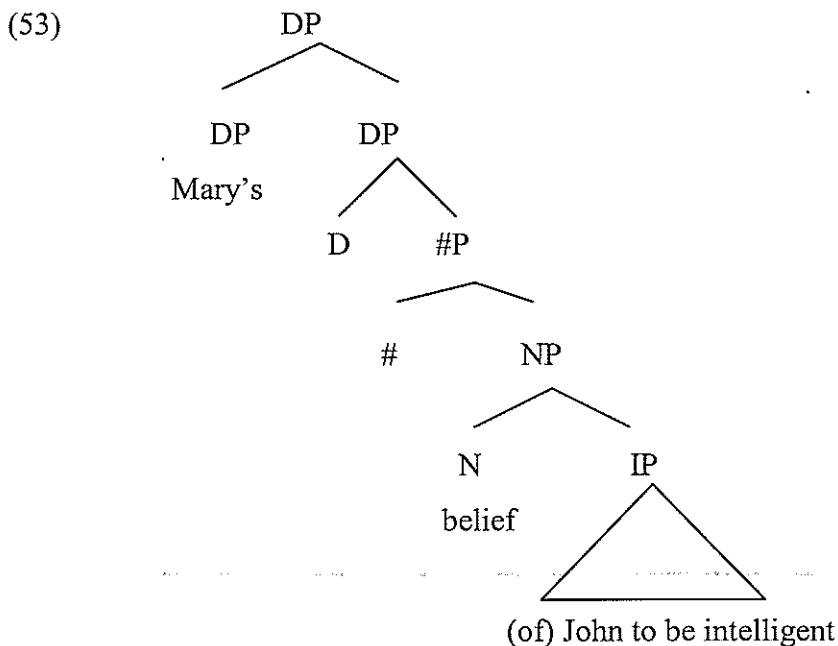
The landing sight for *John* in (48) and (52) differs slightly (specifier of DP and FP, respectively), but the result of crossing IP in each case leads to an ECP violation.

In addition, we should expect a contrast among the gerund counterparts of the derived nominals above, specifically between the *of*-ing type and the Poss/Acc-ing type. In the former case, the infinitival clause is a complement of N, while in the latter case, this IP is a complement of V (hence it wouldn't constitute a barrier to movement). This prediction is borne out:

(54)   *This led to the appearing of John to be intelligent.

(55)   *John$_i$'s believing [t$_i$ to be intelligent] is unfounded.

(56)   *The considering of [John rude] is unfair.

(57)   * John$_i$'s considering [t$_i$ (to be) rude] is unfair.

(58)   We remember John$_i$('s) appearing [t$_i$ to be intelligent].

(59)   We remember them/their believing [John to be intelligent].

(60)   Our considering John (to be) rude is unfair.

(61)   John$_i$'s being considered [t$_i$ (to be) rude] is unfair.

(54) is predicted to be bad for the same reason as (51): when *John* raises at LF for Case, it crosses an IP barrier (the structure is [$_{NP}$ N$_{ing}$ IP]. The same problem occurs in (55), which is the counterpart of (48), **John's belief to be intelligent*; here, the noun *believing* fails to L-mark its IP complement, making any raising out of IP illformed. (56) and (57) illustrate similar points for the small clause predicate *considering*.

When Poss/Acc-ing gerund counterparts are constructed, they are fully grammatical. This is presumably because *appearing* and *believing* in (58, 59) are verbs; therefore each counts as an L-marker, whereas N does not. As the pair in (60, 61) shows, Poss/Acc-ing gerunds license the infinitival or small clause subject via accusative case; when passivization removes this possibility, *John* must raise out of the lower IP for Case reasons. In both cases, IP is not a barrier, since V L-marks IP in the structure [$_{DP}$ D [$_{AgrOP}$ AgrO [$_{VP}$ V$_{ing}$ IP]]].

Thus, we find indirect but strong evidence for the existence of a functional projection in which *of*-marked DPs are licensed: this analysis allows us to give a unified explanation for two puzzling phenomena (the impossibility of Raising and *of*-marking in certain derived nominals), without resorting to unmotivated assumptions about inherent Case.

7. Some potential counterexamples

Recall the data in (7-8):

<u>Profession-class predicates</u>

(7)   Clinton appointed Nader *campaign-reform czar.*

(7a)   For their children's sake, Linda and Bob named Alex *guardian.*

<u>Vocatives and appositives</u>

(8)   Ok, *genius,* tell us how to do it.

(8a)   Few of us ever got to know Katherine Janeway, *gardener* and *pasta-lover.*

Like the manner PP construction, these examples constitute exceptions to the general
requirement that English count nouns have an overt determiner. It turns out they are also
exceptions to the correlation we've seen between overt D on the one hand, and modifiers and
complements on the other:

(62)   Linda and Bob named Alex *guardian of their children.*

(63)   Sally was elected *(the) smartest student in the class.*

(64)   *(*A/this) dear friend,* can you spare some change?

(65)   Katherine Janeway, *(a) tireless defender of the homeless,* is nowhere to be found.

The italicized nominals in (62) and (63) are titles; the appearance of a determiner here is usually
optional. This generalization only holds when the italicized string appears within the small clause
complement of *appoint, elect, name,* etc. (cf. I *consider John *(the) smartest student in class),* so
there is nothing inherent about the bare nouns in (62) and (63) that makes them immune to
having a determiner.

Apparently, this verb class selects a nominal small clause that denotes a property, but
the property generally only holds for one individual at a time; further, the property must be

temporary (cf. *I appoint John Max1 a person)*. These predicate nominals are also exceptional in other ways: unlike complements of the *consider-class, they* are resultatives; and, as Stowell (1989) observed, they can be headed by *as*.

I cannot offer any explanation of these exceptional properties here, but I do want to suggest an answer to the problem presented in (62). We said before that the #P that licenses the complement of a noun can be present when this noun heads a referential argument, but not when N is non-referential, as in *by train* and *goat-herder;* in the latter case, #P would arguably block incorporation of N into V or P. However, for predicate nominals, there is no a priori reason to expect N to raise, and even if it did raise, the motivation for this would be distinct from the motivation for N-to-D raising (one likely possibility is raising of N to some other functional head, perhaps Pred, following Bowers (1993)). Therefore, we have no reason to claim that #P *couldn't* intervene between N and the verb that s-selects the whole predicate nominal.

This explanation essentially carries over to the cases in (64) and (65) as well. Vocatives and appositives are adjuncts, hence they too escape the N-raising requirement argued for by Longobardi; in fact, there is no real evidence that they are DPs. However, nothing rules out the possibility that they contain a functional projection, assuming it serves some purpose, such as licensing a complement of N, as in (51). These data are therefore not counterexamples, but an additional source of support for the analysis we've proposed: we expect cases like these to allow complements and modifiers without an overt determiner.

It should be pointed out that my analysis predicts that any sort of modifier should be allowed in (7-8) (e.g., AP, PP, etc.); this prediction holds true for appositives and vocatives, but not always for small clauses.

(66)   Linda and Bob named Alex (?new) guardian of their children.
(67)   *Nader was elected new president.
(68)   Roger was appointed temporary chair.

There seem to be some subtle semantic distinctions at play here, having to do with the question of what is an appropriate modifier for a nominal denoting a title. I will therefore assume that these facts can be handled outside the syntax.

Another question that arises from the discussion of (7-8) is whether the object of *by* and *via* is simply a predicate; if this were the case, we could no longer distinguish it from the predicates in (7), and its syntactic properties would no longer be accounted for. There is a clear difference, though, between objects of manner PPs and nominal small clauses: the NPs in small clauses have additional functional structure above them (such as Pred or Voice) which allows the noun to get interpreted as a predicate without incorporating; this structure provides a position for the subject of the small clause as well. Bare NP objects, on the other hand, do not have any functional structure above them and never license subjects; their only option is to incorporate into the P or V that selects them. We can assume that they lack this functional projection, be it PredP or VoiceP, precisely because NP is c-selected. Placing a Pred/VoiP below *by* or in a synthetic compound would ultimately lead to uninterpretability, since PredP and VoiceP denote states/events, and what *by* is looking for is an entity (e.g., *plane)* that denotes some mode of transportation.

8. Conclusion

In this paper we've examined a number of constructions from a range of languages, and found a striking similarity which binds them together. The exceptional aspect of some of the constructions (particularly English and Italian manner PPs) derived from necessity: we needed to find special contexts that allowed a determiner to be omitted, and crucially, that determiner had to normally be obligatory in the language in question. The property which all of these constructions shared was a correlation between the presence of DP, and the possibility of modifiers and complements of N.

We also found that a relatively simple assumption about how complements are licensed, in combination with Longobardi's assumption about the position of nominal modifiers, fully accounted for this correlation, even correctly predicting cases where complements should be possible *without* the presence of DP. This analysis also provided a more elegant proposal for English bare singulars in manner PPs. The ungrammaticality of examples like *via interpreter of Chichewa* provided particularly strong evidence for the analysis. Just as important, our theory avoided two serious theoretical problems facing the inherent case account: the lack of a real theta relation in the DP *yesterday's destruction*, and the fact that inherent case is never assigned to

external arguments in the verbal domain, while this is assumed for the NP domain by Chomsky's (1986) account. Finally, our analysis provided a new perspective on some old puzzles concerning Raising out of derived nominals; an advantage of our theory was a more principled account of *of*-insertion in derived nominals, in comparison with previous analyses.

There remain some areas for further exploration: can we show that #P is the functional projection responsible for licensing noun complements? More also needs to be said about the variation that is found in predicate nominals: why is the vacuous determiner required in most nominal small clauses, optional in the *vote*-class and prohibited in vocatives? Is the presence of the determiner here semantically governed?

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Person Distinction of
American Sign Language Pronominals

Susannah V. Levi

svlevi@u.washington.edu

0. Introduction

The issue of personal pronouns in American Sign Language (ASL) has been debated for over ten years. In particular, the discussion has centered on how many distinctions of person (e.g. first, second, third) exist in ASL. Several theories have been used to examined this question and have produced a variety of solutions (Padden 1988, Meier 1990, Lillo-Martin and Klima 1990). Using the Dependency Theory (Fiengo and May 1994), I will show that both the singular and the plural pronominals in ASL do not distinguish between first, second, and third person.

1. The ASL Pronominal System

1.1 Background

To begin, it is important to understand the nature and the form of pronominals in ASL. For those readers who are not familiar with the ASL pronominal system, I will begin with a few terms adapted from Lillo-Martin and Klima 1990 which explain and clarify the notion of a personal pronoun in ASL.

(1)   a.   A *personal pronoun* is an "index finger directed toward a point in space" (Lillo-Martin and Klima 1990: 191).

        b.   This point is called a *referential locus* or *R-locus.*

        c.   The collection of R-loci in a signing utterance is called the *Frame of Reference.*

        d.   Each R-locus is assigned a *referential index* or *R-index.*[1]

Personal pronominals work in the following manner. If the referent is present, the signer will point towards the referent. The presence of the referent suffices to establish him or her in the signing space. On the other hand, if the referent is not present, an arbitrary R-

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[1] This referential index is a semantic constituent and should not be confused with the R-locus, which is a lexical constituent.

locus is established in the signing space that represents the referent. The signer points towards this R-locus when referring to the referent.

There are several ways to establish a personal pronoun in the signing space for a non-present referent.[2] The signer can sign the name of the referent and then point to a location in the signing space. This location is now associated with the referent until the conversation changes. A variant of the above method is to sign the name at the point in space, thus establishing the referent at this point. Another method of establishment is through verb agreement. The direction of the agreement establishes the referent at this position. All of these methods are used to establish a referent in the signing space. Crucially, a personal pronoun can only be used if it has been established. Without nominal establishment, the pronoun is meaningless.

Lillo-Martin and Klima 1990 introduce three aspects of the ASL pronominal system that may cause problems for an analysis using standard theoretical linguistic principles. The first potential problem is the possibility for an infinite number of pronominals. Between any two distinct R-loci, it is possible to establish another distinct R-locus. Under this assumption, the lexicon houses an unlimited number of distinct pronominal signs. The arc around the signer would contain a potentially infinite number of pronominals, each differing from one another by only a fraction of a degree.

The second potential problem for ASL pronominals is their lack of ambiguity. In English, for example, the sentence in (2) is ambiguous, while its ASL counterpart is not.

(2)   Margaret thinks she is ugly.

In English, the sentence can either mean Margaret finds herself unattractive, or it can mean that Margaret finds someone else unattractive. In ASL, however, the pronoun *she* will be directed towards a particular point in space and will therefore not be ambiguous.

The third potential problem is the possibility of a *Shift of Reference*. In ASL, signers can shift their body position, thereby changing the position of all of the established R-loci. A similar effect is created in English by use of a direct quotation.

(3)   a.   Laurence said that he wants to leave.
        b.   Laurence said, "I want to leave."

In (3b), the pronoun *I* is interpreted as referring to *Laurence*, even though someone else is uttering the sentence. In ASL, this is done via a shift of reference. The signer will move

to the location associated with Laurence or simply change the angle of signing. Thus, the pronominal sign pointing towards the signer is no longer interpreted as referring to the signer, but as referring to Laurence.

It is important to notice that there are two types of shifting, linguistic shifting and non-linguistic shifting. The former is produced as discussed above. The signer shifts his or her body position which in turn causes all of the R-indices to shift. That is, linguistic shifting affects the interpretation of the R-indices. Non-linguistic shifting, on the other hand, does not affect the interpretation. An example of non-linguistic shifting would be two signers conversing while walking around. Though the signers may turn their body positions to look around or to follow the curve of the path, they do change the location of the R-indices. If they have shifted to the extent that it is no longer clear where a referent is located, the signer can reestablish the R-locus.

1.2 Previous Analyses

Analyses of the number of pronominals in ASL begins with Padden 1988. In her book, she posits three distinctions of person in ASL pronouns. Her descriptions are listed below.

(4)　　a.　　*1person*: near the signer's body.　　　　　　(Padden 1988: 28)

　　　　b.　　*2person*: in direction of addressee (either real or discourse marked).

　　　　c.　　*3person*: the agreement marker will have the same locus point i in neutral space as the assigned 3person nominal locus point i.

In this analysis, first person refers to the signer, second person refers to another present party, and third person refers to non-present people. Padden does recognize the potential for an infinite number of personal pronominals, but dismisses it as a peripheral issue because only four or five are ever used at once in a conversation (Padden 1988: 30). Padden bases her assumption of the number of pronouns on the directionality of the pronoun. Under her analysis, the possibility of a pronoun sign, which can point towards the signer, the addressee, or a non-present referent, implies that there must be a three way distinction.

A second analysis proposed by Meier 1990 posits only two distinctions of person in ASL pronouns. He proposes a division of pronouns into two classes: first person and non-first person. He bases the existence of the first person pronoun on the fact that the first person plural is not simply a compound formed from the first person singular and the

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[2]All of these methods of nominal establishment are adopted from Bellugi et al. 1987.

plural morpheme. He further argues that the first person pronoun is motivated by the shift of reference, or *role-playing*. Because points directed toward the signer can refer either to the signer or to the *quoted* signer (in the shifted frame), Meier argues that the first person pronoun is distinct from the others. He further argues that there is no distinction between the second and third person pronouns because of the overlapping points. Because the second person can be standing at any point in the signing space not occupied by the signer, the second person pronoun is indistinguishable from the third person pronoun. Furthermore, Meier mentions some agreeing verbs which cannot take a first person object, but can take either a second or third person object. Under his analysis, the existence of these verbs illustrates the two way distinction of ASL pronominals.

A third analysis proposed by Lillo-Martin and Klima 1990 utilizes a syntactic theory introduced by Roberts 1985 known as the Discourse Representation Theory (DRT). This approach deals with discourse as a separate level of representation occurring after S-structure. Under Roberts' analysis, a *Discourse Representation Structure* (DRS) is assigned to each *segment*, where a segment can be one sentence or several sentences. An example of a DRS is given in (5).

(5)   Pedro owns Chiquita. He beats her. (Lillo-Martin and Klima 1990: 197)
        Discourse Representation Structure

| $x_i\ x_j$
Pedro owns Chiquita
Pedro (x_i)
Chiquita (x_j)
x_i owns x_j | 'Pedro' is associated with x_i
'Chiquita' is associated with x_j |
| He beats her
x_i beats her
x_i beats x_j | 'he' is interpreted as x_i
'her' is interpreted as x_j |

Roberts claims that at S-structure, the NPs *Pedro, Chiquita, he,* and *her* have the indices i, j, k, and l, respectively. At S-structure, the indices in the two sentences are not related. At the DRS, however, the indices become associated with the above reading. Roberts further claims that this approach predicts that two coindexed NPs could be noncoreferential and that two noncoindexed NPs could be coreferential.[3] The level of DRS is what determines whether or not two NPs are coreferential.

Using this approach, Lillo-Martin and Klima confront the three unusual aspects of ASL presented in section 1.1. They reject the notion that there is an infinite number of distinct pronominals in the ASL lexicon. Instead of viewing the pronouns as distinctions

of person, they posit that the "pronominal distinctions in ASL represent a *free* partitioning of certain areas of space into *meaningful* distinctions in form" (Lillo-Martin and Klima 1990: 198). Under this analysis, ASL has only one pronoun (glossed PRONOUN) that has infinitely many R-indices. In ASL, these indices are overtly marked, contrasting with spoken languages where indices are generally covert. Hence, the first, second, and third person pronouns differ only in their R-index. At PF, these distinct R-indices are represented by distinct R-loci. That is, if two PRONOUN signs have the same R-index, they will be signed at the same R-locus.

Using the idea that there is only one pronoun in ASL and Discourse Representation Theory proposed by Roberts, Lillo-Martin and Klima rectify the other two unusual aspects of the ASL pronominal system. First of all, Lillo-Martin and Klima show that ambiguity does indeed exist in ASL. Both of the sentences in (6) are ambiguous (Lillo-Martin and Klima 1990: 200).

(6)   a.   Mary thinks that she has the mumps, and Alice does too.

     b. $_a$MARY, $_b$ALICE. $_a$PRONOUN THINK $_a$PRONOUN HAVE MUMPS, $_b$PRONOUN SAME.

The sentences in (6) can either mean that Alice also thinks that Mary has the mumps (Strict Reading) or that Alice thinks that Alice has the mumps (Sloppy Reading). In the Discourse Representation Theory, Roberts claims that the pronoun *she* from (6a) is c-command bound in the sloppy reading and not c-command bound in the strict reading, thereby accounting for the two interpretations. Lillo-Martin and Klima posit that the DRS is relevant to ASL pronominals on the basis of this example.

Secondly, they propose that DRT can account for the shift of reference in ASL. At S-structure, R-indices are assigned to NPs. Then at DRS, the equation shifts by some parameter, such as $x_i = x_j$. Hence, in the shifted frame we interpret an R-index with a discourse referent of different R-index. Therefore, two signs with the same R-index can have different referents and be noncoreferential. By the above analyses, Lillo-Martin and Klima show how it is possible to account for the three unusual aspects of ASL pronominals.

2. Dependency Theory

Before continuing further into the analysis of ASL pronouns, I would like to offer a brief introduction into a new theory of reference proposed by Fiengo and May 1994.

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[3]See Lillo-Martin and Klima 1990 for further discussion.

They propose separating the job of the referential index into two distinct parts. They posit a system whereby a subscripted index (called the *indexical value*) is subject to Binding Theory (BT) (Chomsky 1980), while the superscripted index (called the *indexical type*) is not. This superscripted component is subject to what they call Dependency Theory (DT). NPs with an indexical type α are independent, while NPs with an indexical type β are dependent on another NP for their reference. Thus, under this theory of reference, BT constrains elements syntactically, while DT shows the way reference is determined and the source of the referent. A brief example is illustrated in (7).

(7) a. John$^{\alpha}_1$ saw his$^x_{\#}$ mother.

In (7), there are three possible interpretations of the NP *his*. It can have the indexical pair $(\alpha, 2)$, $(\alpha, 1)$, or $(\beta, 1)$. The indexical pair $(\beta, 2)$ is not possible because an NP cannot be dependent on another NP for reference but have independent reference at the same time. Therefore, we have only the three possibilities listed above. The first possibility means that the pronoun is not dependent on any previous NP for its reference and it is not coindexed with any other NP. The second indexical pair means that the pronoun is not dependent on a previous NP for reference, but it is coindexed with (and therefore coreferent with) another NP. This is similar to the old analysis of accidental coreference (Higginbotham 1985). The third ordered pair means that the NP is dependent on another NP for reference and therefore is forced to receive the same indexical value. Notice that in both cases of an indexical value of 1, Principle B of the BT is satisfied.[4]

The example in (7) illustrates that English has occurrences of both α and β indexical types. In particular, names always have an α indexical type, pronouns can have either α or β, and anaphors have β. When a sentence involves a plural pronoun with a split antecedent, the indices are added to one another. With the reading that *they* refers to *Joan, Mary,* and *Sally*, we get the indexation in (8).

(8) Joan$^{\alpha}_1$, Mary$^{\alpha}_2$, and Sally$^{\alpha}_3$ said they$^{\beta}_{1+}{}^{\beta}_{2+}{}^{\beta}_3$ bought a house.

Lastly, in DT, the form of the pronoun at PF is not pertinent to its interpretation at LF. That is, only the subscripted elements are relevant at LF.

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[4] Principle B states that a pronominal must be free within its governing category (Chomsky 1981).

3. Dependency Theory and ASL

Now the question is, what does Dependency Theory predict about the number of personal pronouns in ASL? We will soon see that DT, like Discourse Representation Theory proposed by Roberts 1985 and 1986, predicts only one pronoun in ASL. We saw in section 2 that English has pronouns with an indexical type of α or β. ASL, on the other hand, is more restricted. Because all pronouns in ASL must be established in the signing space and therefore must have an antecedent, *they all receive a β indexical type*. To see that this is the case, it suffices to recognize that a pronominal is meaningless if no R-locus has already been established in the signing space. In other words, a pronoun in ASL cannot be assigned an indexical type α, because it is dependent on a previous NP (via nominal establishment) for its reference. Therefore, ASL pronouns differ only in their indexical value.

We now consider the indexical value. To see that the DT predicts only one pronoun form in ASL, we must consider the shift of reference. If a sentence like (9) can be signed in two different ways but that have the same indexical pair, then these two pronouns must actually be the same.

(9)   x went to the store.

In other words, if an index finger directed toward the signer and an index finger directed toward a point in space can both convey the meaning that the same person went to the store, then the two pronouns are not distinct.

To see how this works, we must consider an example. If the signer establishes *John* at a location to the right of the signer, a pronoun directed towards this location will have some index, call it j. In other words, the pronoun will have the indexical pair (β, j). When the signer shifts so that the pronoun pointing towards the signer no longer means *I*, but rather *John*, the pronoun also carries with it the indexical pair (β, j). The β comes from the fact that all ASL pronominals are dependent. The j comes from the understanding that this pronoun (the index finger pointing at the signer) refers to *John*, and not to *I*. Since the internal ϕ-features of the pronoun are not relevant to its interpretation (only the pair consisting of the indexical type and value are relevant), the pronouns are one and the same. Thus, first and third person are not distinct. Similarly, for the ASL sentences that correspond to the English translations in (10), the same pronominal is used in both. That is, the index finger points toward the R-locus for John.

(10) a. I told John, "You are mean."
      b. I told John that he is mean.

Hence, by transitivity, first equals second equals third person pronouns. This means that the DT predicts only one pronoun in ASL which can have infinitely many indexical values. In this way, we see how the ASL pronoun pointing towards the signer, but with the index *j* for *John*, and the pronoun pointing towards the R-locus assigned to *John* are one and the same. They only differ phonologically in their orientation.

Furthermore, the non-singular pronouns neatly conform to this model. Consider the situation where the signer establishes *John* at an R-locus to the right and *Mary* in front, while the addressee is on the left. If the signer wishes to express the idea *we*, meaning *John and I*, he or she will use the K-handshape and will move it between the R-locus for *John* and the R-locus for the signer. In this way, the pronoun takes on these two R-indices. To sign *they*, meaning *John and Mary*, a similar method is used by moving the K-handshape between the R-loci referring to *John* and to *Mary*. To refer to *you*, meaning *the addressee and Mary*, the K-handshape is moved between these two R-loci. As was the case with the singular pronoun, the plural pronoun overtly shows reference. In ASL, a plural reference often has a split antecedent, as in the English example in (8). By moving the handshape (K for two people, 3 for three people, etc.) between the R-loci, the plural pronouns, *we*, *you*, and *they* (discussed above) all carry the same form and only differ in which R-indices are picked up. That these plural pronouns have the same form is further evidence that the plural pronouns do not inflect for person.[5]

The absence of multi-person pronouns does not imply a lack of the conceptual distinction of person. Despite the fact that ASL has only one pronoun, it is clear that signers understand the distinction between the signer, the addressee, and non-present referents. In fact, there are spoken languages which exhibit a pronoun much like the ASL pronoun discussed above. One such example is the case of the Japanese pronoun *zibun*. This anaphor can have first, second, and third person antecedents and mean *myself*, *yourself*, and *himself* respectively.

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[5]There is an alternative sign for *we*, signed with the G handshape touching two points on the signer's chest. However, a native ASL signer informed me that this sign is not ASL, but rather signed English.

(11)   a.   **Zibun**-wa   gakusei-desu   (Mariko Yanagawa, personal communication)

I-topic   student-be (polite)

"I am a student."

    b.   Anata-wa **zibun**-o nikun-de i-ru (M. Yanagawa, personal communication)

you-topic self-acc. hate-Prog-Pres

"You hate yourself."

    c.   John$_i$-wa   **zibun**$_i$-o   nikun-de i-ru   (Ueda 1986)

John-topic self-acc.   hate-Prog-Pres

"John hates himself."

Hence, we see that it is possible for languages to have one pronoun which can refer to the first, second, or third person.

4. Conclusion

I have shown that the Dependency Theory proposed by Fiengo and May offers new insight into the discussion of ASL pronominals. I briefly discussed three prior approaches to pronouns in ASL. Each one of these analyses predicted a different number of personal pronouns in ASL–three by Padden 1988, two by Meier 1990, and one by Lillo-Martin and Klima 1990. What I have shown is that the Dependency Theory also predicts the existence of only one personal pronoun in ASL. Furthermore, plural pronouns in ASL conform freely with the conditions of split antecedents, as proposed by the Dependency Theory. The existence of the Japanese pronoun *zibun* in section 3 shows that it is not impossible for spoken languages to also contain such a pronoun.

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Functional categories and the acquisition of object clitics in L2 French

Julia Herschensohn

herschen@u.washington.edu

0. Introduction [1]

The acquisition of L2 functional categories is a topic of importance to both syntax and morphology, for in minimalist terms morphological features of functional categories are the motivating force of the syntax. The topic raises two questions: first, whether L2ers can acquire categories that are absent in the L1; and second, how the acquisition proceeds. The first question relates to the issue of UG access in L2 acquisition since scholars who espouse both no access and L1 only (partial) access predict that L2ers cannot acquire such functional categories. The second question contrasts two approaches to L2 functional categories put forth in recent work, the Full Functional (White 1996) and the Incomplete Functional (Vainikka & Young-Scholten 1996). In this paper I report on the acquisition of L2 French clitics by two anglophone subjects studied longitudinally. Assuming that French clitics are heads licensing *pro* in argument position, I propose four realizations of development of L2 object clitics that support the Full over the Incomplete Functional approach. I first review the contrasting theories, then present the collected data, and finally discuss theoretical implications.

1.0. Theory

1.1. L2 Functional categories

Two approaches to the role of functional categories and morphological inflection in the emerging L2 grammar are put forth in recent studies. One is the *Incomplete Functional* whereby the early L2 grammar has initially only lexical projections that

correlate with incomplete morphology (Eubank 1993/94, Vainikka & Young–Scholten 1996) The second is the *Full Functional* whereby the early L2 grammar may access all functional projections, which are not directly dependent on the mastery of morphological inflection (Grondin & White 1996, Schwartz & Sprouse 1996, Lardière 1998). I detail the two approaches below.

The Incomplete approach posits two important assumptions, that functional categories in L2 are initially underspecified and that their activation is directly linked to the specification of morphology. Vainikka & Young-Scholten use longitudinal data from adult L2ers (with Turkish and Korean as L1) learning German to argue for a weak continuity approach to the initial state. They propose that the initial L2 grammar is incomplete with respect to functional categories (cf. Radford 1990), but that L1 lexical categories and headedness can transfer to the L2. They propose that the early interlanguage (IL) grammar—which overtly lacks IP, CP, agreement, complementizers, verb raising and overt subjects—develops at a subsequent stage into one which has all of those features. The early L2 grammar would then resemble the VP stage exemplified in the early stages of the child's truncation period. Their Minimal Trees Hypothesis, proposing that L2 functional categories develop gradually in the L2 grammar, has been challenged (Epstein et al. 1996) on the grounds that it cannot account for L1 transfer effects or for the ongoing / eventual acquisition of L2 categories. A second incomplete approach is that of Eubank who proposes a "defective" L2 initial grammar that is not that of the L1, maintaining that functional categories, while they can transfer from L1, have underspecified (or inert) features. He finds that L2ers show a clustering of acquisition features, namely, verb raising with the acquisition of tense, a fact that he attributes to the specification of tense in the L2 grammar.

In contrast, the Full Functional approach incorporates three crucial characteristics, Missing Inflection (Lardière 1998) and Full Transfer, Full Access (Schwartz & Sprouse 1996). This approach maintains that the L2 grammar begins with "the entirety of the L1 grammar" (i.e. Full Transfer) that is restructured due to failure to assign a representation to input data. The L2er has Full Access to all UG possibilities although they are not

necessarily employed. Activation of functional categories is not dependent on acquisition of L2 morphology; rather, L2ers' production of morphological errors is attributed to problems in mapping between syntax and morphology. Lardière argues that such difficulties are related to processing and morphological spell–out on the part of the L2er. "It may be this mapping itself—in the morphology or PF component—which is imperfectly acquired, and from which the status of syntactic phrase structure might therefore not be reliably inferred." (Lardière 1998, 2) The missing overt morphological features may be phonetically unrealizable in fossilized grammars with impoverished morphology, rather than representing a mismatching of phi features in the syntax. The two approaches make quite distinct claims and predictions. I turn now to French object clitics.

1.2 French object clitic pronouns

French clitic pronouns are dependent on a verb (usually preposed it), strictly ordered, phonologically unstressed, subject to liaison / elision, and in complementary distribution with their stressed counterparts (e.g. *me / moi*).[2]

(1) Clitic pronouns

    a. Il ne me le donne pas. 'He doesn't give it to me.'

    b. *Il ne le me donne pas.

    c. Il me l'a donné. 'He gave it to me.'

    d. Il ne l'a donné qu'à moi. 'He gave it only to me.'

    e. *Il ne l'a donné qu'à me.

English, on the other hand, has pronouns that resemble DPs syntactically and phonologically—they receive stress and are placed in the same positions as full DPs. They can be assumed to be in determiner position and to project as full DPs (Reinhart & Reuland 1993, 658).
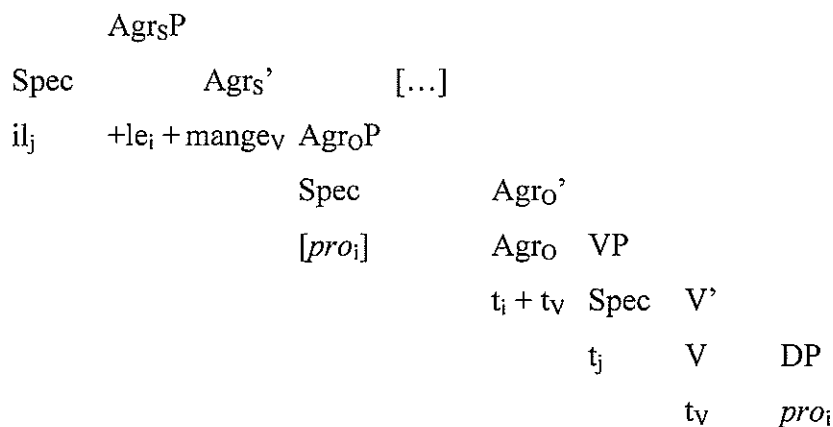
(2)   [DP pronoun [NP ....e ....]]

Hawkins, Fritz Newmeyer and Karen Zagona for useful discussions.

[2] Kayne (1975) notes several syntactic traits of clitics such as their inability to be conjoined or separated from the verb:*Je le et la vois. 'I see him and her.'; *Il, paraît-il, est parti. 'He, it seems, has gone away.'

There are significant differences between French and English in the realization of pronouns and their checking in functional categories. English uniformly has covert movement of object DPs and LF checking of their features; pronouns are most often phonologically independent.[3] French has overtly raised agreement markers, clitics that are verb dependent, in addition to independent pronouns. Full DPs that are direct objects raise covertly (at LF) in both English and French to Spec AgroP to check objective case, since there is no strong feature of Agr_O forcing overt movement. On the other hand, French and English pronouns show distinct behavior. French object clitics can be analyzed as agreement morphemes (Suñer 1988, 1998) generated in Agr_O, licensing and identifying *pro* in the argument position by the phi-features of the clitic, as required (Rizzi 1986).[4]

To illustrate this analysis, in (3) the verb raises by head movement from its position in VP. Direct object *pro* forms a chain linking its base position to the Spec of AgroP where its (case and phi) features are checked for case and agreement with the clitic *le* originating in the head Agr_O. At LF direct object *pro* (depicted in brackets) raises to the object agreement node to check features and case.

(3) Il le mange. 'He eats it.'

$$Agr_SP$$

Spec	Agr_S'	[...]
il_j	$+le_i + mange_V$ Agr_OP	
	Spec	Agr_O'
	$[pro_i]$	Agr_O VP
		$t_i + t_V$ Spec V'
		t_j V DP
		t_V pro_i

---

[3] Schwartz (1998) discusses English clitic pronouns which serve as "transfer models" for French clitics in the corpus analyzed by White.

[4] Cf. Roberge 1990, Auger 1995, Bonet 1995, Sportiche 1996, Herschensohn 1996 for discussions of clitics that includes two object agreement nodes (accusative and dative).

The anglophone French L2er must learn the phonological, morphological and syntactic differences between English and French. White (1996, 336) describes the significance of this task for the L2 researcher:

> If an L2 learner of French shows early evidence of syntactic clitics and their projections, this suggests that potential functional categories made available by UG but not instantiated in the L1 can be triggered on the basis of L2 input. Furthermore, if clitic projections are available from the earliest stages, it would support the hypothesis that there are no qualitative changes in the IL grammar with respect to properties of functional categories.

On the assumption that clitics head functional projections, White argues convincingly that anglophone children learning French acquire clitic projections early and are thus not restricted to their L1 inventory of functional categories.[5] Hence, she argues against the "maturation" approach to functional categories of Vainikka & Young–Scholten and for availability of UG to the L2er.I turn to my current study.

2.0. Empirical data

2.1. Current study

The data I examine are produced by two anglophone subjects, 16–17 years of age, one of whom, "Emma" continues her study of French in an American academic setting, while the second "Chloe" spends six months in France as a student in a French lycée. The corpus consists of three tape-recorded interviews with each subject conducted before, during and after the period of immersion of the second subject.[6] The format of the interview includes simple present tense topics and non–present tenses as well as activities that elicit use of object pronouns. The transcriptions were verified by a phonologist who specializes in French. The two teenage subjects are intermediate, even in the first interview, in that they productively use verbal inflection and use movement to CP in both questions and relative clauses. Their interlanguage grammars contain a range of finite forms, including even from Interview I, past and future tense. By the third interview their

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[5] Duffield et al. (1997) present experimental data supporting White's proposal for adult L2ers.

accuracy of verbal inflection is at 89% for Emma and 98% for Chloe, so they are far more accurate morphologically than Lardière's subject who shows 34% suppliance of tense in obligatory context.

As for object clitics, Emma and Chloe furnish a total of 25 contexts of obligatory use (Appendix 1), with four different types of realization of the pronouns, exemplified in (4) (the Roman numeral refers to the interview). The examples from the four types overlap in that they are not chronologically distinct (Appendix 2). The breakdown is as follows: four tokens (16%) of L1 transfer (in situ pronouns); nine tokens (36%) of object drop; four tokens (16%) of a clitic attached to a past participle; and eight tokens (32%) of target usage, attachment of the pronoun to the appropriate verb. Examples of each stage are provided in (4).

(4) Examples of L2 pronouns, Emma & Chloe

    Type One: L1 transfer

        a.   J'ai vu elle. = Je l'ai vue 'I have seen her.' (Emma I)

        b.   Il a demandé à moi. = Il m'a demandé. 'He has asked me.' (Chloe II)

    Type Two: object drop

        a.   T'as placé [*pro*] sur le lit. = Tu les a placées sur le lit. 'You have placed [them] on the bed.' (Chloe II)

        b.   Je n'ai pas vu [*pro*]. = Je ne l'ai pas vu. 'I haven't seen [it].' (Emma II)

        c.   Vous avez pris [*pro*] dans votre tête. = Vous les avez prises dans votre tête. 'You have taken [them] in your head.' (Emma II)

    Type Three: attachment to past participle

        a.   Vous avez la pris. = Vous l'avez prise. 'You have taken it.' (Emma II)

        b.   Il a les fini. = Il les a finies. 'He has finished them.' (Emma III)

        c.   Elles ont le quitté. = Elles l'ont quitté. 'They (f.) left it.' (Emma III)

    Type Four: target production

        a.   Je l'ai ruiné. 'I have ruined it.' (Chloe III)

        b.   Je vais le monter. 'I'm going to climb it.' (Emma III)

        c.   Nous nous réveillons à 2h. 'We get [ourselves] up at 2 a.m.' (Emma III)

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[6] The length of each interview increases during the six month period, varying from approximately 300 to 700 words (specifically, Emma 337, 525, 839; Chloé 465, 639, 789).

Although there is not a clear chronological distinction between the types—for example in the second interview Emma produces tokens of all four types—I have designated these types based not only on my own study, but on other research.

2.2. Other studies

Earlier studies provide data that resembles that of my subjects. Selinker et al. (1975) and Adiv (1984) both study anglophone children in French immersion school settings in Toronto and Montreal respectively (5-6).[7]

(5)   Sample L2er clitic errors, L1 transfer (Selinker et al. 1975)

      a.   Je vais *manger des pour souper. (= en manger)

         I go to eat some for supper

      b.   Le chien *a mangé les. (= les a mangés)

         The dog has eaten them

      c.   Il *veut les encore. (= les veut)

         He wants them still

(6) Object drop (Adiv)

      La maman demande qui a mangé le gâteau et la petite fille répond:

      J'ai mangé (= je l'ai mangé)

      'The mom asks who ate the cake and the little girl answers: I ate'

The sentences in (5) show L1 transfer, while those in (6) show object pronoun omissions—unacceptable in the mature grammars of both L1 and L2. It is the most frequent of the four options chosen by my subjects who produce sentences such as those in (7).

(7) Type two, null objects[8]

      a.   Nous regarder [*pro*] seulement. 'We looked at [it] only.' (Emma II)

      b.   Tu as placé [*pro*] parterre. 'You put [it] on the ground.' (Chloe III)

Towell & Hawkins (1994, 137) suggest that L2ers "hypothesize, on the basis of the absence of phonetically specified pronouns in this position, that French has object *pro*."[9]

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[7] Véronique (1984) notes the same kinds of errors in his subjects whose L1 is Arabic.

[8] Emma uses a default infinitive instead of correct *avons regardé* 'have looked'.

The object drop phenomenon is also attested in L1 acquisition. Mĵller et al. (1996), who study the development of object clitics in a French-German bilingual child, Ivar, note that he uses object drop during a period of eight months (8).

(8) Examples of Ivar's null objects

        a. Non maman prend 'No mommy take'

        b. Veut Ivar 'Wants Ivar'

        c. Remets ici 'Put back here'

The third type, attachment to the past participle, is cited by Towell & Hawkins who describe clitic attachment to the past particple.[10] Emma gives several examples with this pattern, but Chloe doesn't (9), although both girls consistently accept this pattern on grammaticality judgement tasks.

(9) Third and fourth types

        a. Vous avez me donné le cassette. 'You have given me the cassette.'

           (Emma III)

        b. Je l'ai ruiné. 'I have ruined it.' (Chloe III)

The final type—correct target usage of object clitics with conjugated thematic verbs, auxiliaries and infinitival forms—is attested in my corpus, but is also well documented in the work of Towell, Hawkins & Bazergui (1996). They provide numerous examples of the development of obligatory clitic mastery by their longitudinal subjects. I now turn to a discussion of the data.

3.0. Discussion

Adapting elements of a morpho-syntactic treatment of clitics (Roberge 1990, Sportiche 1996), I assume French clitics—which identify and license *pro* in argument position—affix to the inflected verb in Agr_o functional projections and raise overtly with the verb to Agr_s. In contrast to French, the L1 English grammar has in situ pronouns that raise covertly to check case and features at LF. I will argue that the Full Functional but

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[9] They suggest that the French licensing of object *pro* described by Authier (1991) is a kind of trigger for the null object stage. While this explanation is theoretically appealing, it seems empirically unlikely since such constructions are not likely input to the L2 learner at this point.

not the Incomplete Functional approach is able to account for the empirical data and is preferable on theoretical grounds.

3.1. Incomplete vs. Full Functional

An application of the Incomplete Functional approach gives a questionable VP account of Types One and Two, presuming that all elements remain VP internal. These types require a truncation of projections to a VP, as (10) illustrates.

(10)   Types One and Two in terms of Minimal Trees

   a. Type One

       VP

       Spec   V'

       Le chien   V   DP

                  mange les

   b. Type Two

       VP

       VP   Adv

       Spec   V'   seulement

       nous   V   DP

            regarder   [null]

The proposal of the minimal trees outlined in (10) is only adequate for (10b) which has a default infinitive (no tense), but it is impossible for (10a) where the verb has tense, and for the examples that include auxiliary verbs such as (11).

(11)   Types One and Two with auxiliaries

   a. J'ai vu elle. 'I have seen her.'

   b. Je n'ai pas vu [0]. 'I haven't seen [it].'

The two sentences in (11) require higher functional projections for auxiliaries, negation and subject clitics. Similarly, while Type Three might be considered VP cliticization, it

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[10] Roger Hawkins (p.c.) has shared his unpublished data which shows this pattern by anglophone French L2ers both in production and in grammaticality judgement tasks.

still requires the projection of *aux* in a higher functional category, contradicting the assumption of "only lexical" projections.

In contrast, the Full Functional approach *predicts* Type One transfer and Types Two-Four availability of L2 functional categories and defective morphology (Missing Inflection). Assuming initial transfer, Type One French continues to use the English in situ pronouns as in (12) where the pronoun is an independent one whose features are checked at LF as in English.

(12) J'ai vu [$_{DP}$ elle]. 'I saw her.'

In Types Two and Three the Full approach posits an Agr$_o$ node that hosts the clitic (null in (13a), overt in (13b)) licensing [*pro*].

(13) Type Two, Three, null objects without and with clitic

        a. Je n'ai pas [$_{Agro}$ *e*]$_i$ vu [*pro*]$_i$. = Je ne l'ai pas vu. 'I haven't seen [it].'

        b. Il a [$_{Agro}$ les]$_i$ fini [*pro*]$_i$. = Il les a finies. 'He has finished them.'

The null clitic (13a) is an example of Missing Inflection due presumably to processing and production deficiencies on the part of the L2er. Attachment of the object clitic to the past participle shows that the IL grammar has not matured sufficiently at this stage to force movement of the clitic to TP / Agr$_s$. The final type (14) resembles that of the mature French grammar described in section one.

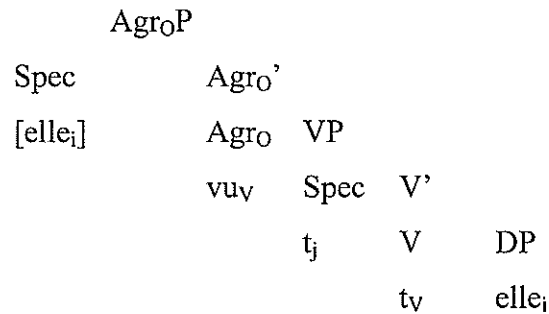(14) Je [l]$_i$'ai [$_{Agro}$ t$_i$] ruiné [*pro*]$_i$. 'I ruined it.'

According to this analysis, after a period of L1 transfer, anglophone French L2ers restructure their grammars because the L1 initial version cannot match the L2 input. Theoretically the Incomplete approach cannot explain the transition from one type to the next or the final mastery of L2 clitics, whereas the Full analysis posits UG constrained intermediate types that lead directly to a standard account of French clitics. Intermediate Types Two and Three are not random possibilities, but options predetermined by the functional projections.

3.2. Model derivations

The Full Functional proposal furnishes an interlanguage link between the L1 grammar which has in situ pronouns that raise covertly to check case and features at LF
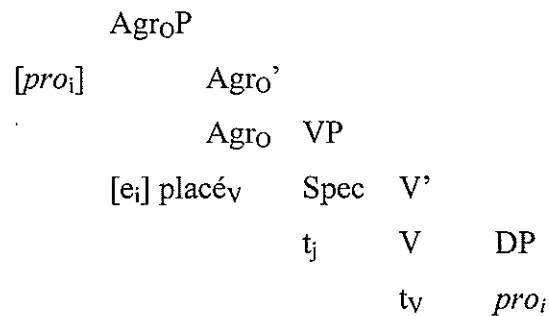
and the L2 grammar which has clitics that license object *pro*. The intermediate types have null or misplaced clitics. The trees in (15)-(17) demonstrate the three hypothetical types for such sentences, showing LF covert feature checking with the items in brackets (e.g. [elle], [*pro*]).

(15) Type One L1 transfer: J'ai vu elle.

```
                    Agr₀P
        Spec            Agr₀'
        [elleᵢ]         Agr₀   VP
                        vuᵥ    Spec   V'
                               tⱼ     V      DP
                                      tᵥ     elleᵢ
```

For Type One the L2er continues with the English system of in situ pronoun and LF checking of features. For Type 2 the IL grammar posits *pro* in the base objective position and allows the verb to license *pro*. For Type 3 the L2ers project clitic pronouns which are able to license object *pro*, but they do not raise the clitics to the conjugated verb.

(16) Type Two unlicensed *pro*: T'as placé *pro* sur le lit.

```
                    Agr₀P
        [proᵢ]          Agr₀'
                        Agr₀   VP
                        [eᵢ] placéᵥ   Spec   V'
                                      tⱼ     V      DP
                                             tᵥ     proᵢ
```

(17) Type Three clitic attachment to past participle Il a les fini [*pro*].

```
                    Agr₀P
        Spec            Agr₀'
        [proᵢ]          Agr₀   VP
```
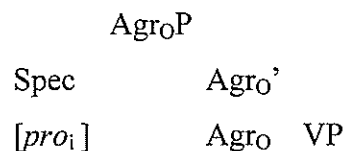
$$les_i + fini_v \quad Spec \quad V'$$
$$t_j \quad\quad V \quad DP$$
$$t_v \quad\quad\quad pro_i$$

Advanced L2ers are able to master completely the clitic and tonic pronoun distribution of French even though the English L1 pronominal system operates quite differently, an indication that they are able to acquire new settings for functional categories as well as new syntactic and morphological realizations of anaphoric elements.

4. Conclusion

The longitudinal data from two anglophone French L2ers demonstrating four types of clitic development support the Full Transfer over the Incomplete Functional approach while furnishing evidence of UG access in L2A. Given this analysis, I propose the following development for L2 clitics in my data. Type 1 continues with the English system of in situ pronoun and LF checking of features. Type 2 has *pro* in the base objective position, but no clitic to license it, a violation I attribute to defective morphology (Lardière). Type 3 demonstrates the licensing of *pro* by a clitic, but one which is attached to the verb that selects it, not the inflected one. Finally, type 4 sees correct production of object clitics in L2 French. The proposed treatment shows UG availability to intermediate and final stages of interlanguage grammar and also demonstrates that L2ers are able to master functional features and movement associated with them even when the L1 differs.

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Appendix: Tokens of object pronouns / clitics, Emma & Chloe

J'ai vu elle en septembre prochain. (Emma I)

Il a donné à moi. Il a demandé à moi.

T'as placé tes lunettes sur la table. T'as, T'as ré-, réplacé [*pro*] dans la tête, dans ta tête.

T'as placé [*pro*] sur le lit.

T'as placé [*pro*] dans un sac de quelque sorte. (Chloe II)

Oui, je l'aime beaucoup.

Ma petit soeur elle ne veut pas pour … elle veut pour me rester ici.

[plantes ramassées?]

Nous regarder [*pro*] seulement.

[études de biologie marine?]

Je veux les continuer.

Je ne n'ai pas vu [*pro*] "yet".

Elle a dit à moi que sa professeuresse est une femme qui est très grande et la mère de la professeur elle est grande aussi.

[Qu'est-ce que j'ai?]

Vous avez votre lunette.

[Qu'est-ce que je fais?]

Vous avez la pris.

[maintenant?]

Vous avez pris votre lunnet [lyne] dans vos sac.

[maintenant?]

Vous avez pris [*pro*] dans votre tête. (Emma II)

Je l'ai ruiné mon maillot de bain.

Et je reste avec eux pour une semaine. Et après ma mère me rejoindre.

Tes lunettes. Tu as placé [*pro*] par terre.

On ne me dit rien. (Chloe III)

Maintenant il travaille à Thriftway à West Seattle. Mais il va quitter [*pro*] bient⇔t.

Oui. Nous nous réveillons à deux heures.

Je ne sais pas si je vais le monter, mais je souhaite [*pro*].

Elles ont le quitté aussi.

[Il a fini ses études?]

Il a les fini.

Une cassette. Vous avez me donné le cassette. (Emma III)

Let It Green: The Ecoization of the Lexicon

Brad Benz
bbenz@u.washington.edu

Arguably, the "greenwashing" of the English lexicon began in 1969 when, according to the *OED2,* two West German environmental groups formed two political parties: the Green Campaign for the Future (*Grune Aktion Zukunft*) and the Green Lists (*grune Listen*). [1] Add to these groups the first "Earth Day" celebration on April 22, 1970, and perhaps the key "green" players are in place. If one of their goals was to raise awareness about the degradation of the environment--or "eco-consciousness"--then no doubt they were victorious, at least in terms of inserting green discourse into the language.

One such item, *eco-*, is firmly positioned in the lexicon. As early as 1972, *American Speech* documented the following examples: *eco-awareness, eco-house, ecomodel, econut, ecopolypse, and Eco-bag.* *Eco-* continues to be a popular first element in contemporary English and has become more diverse and flexible in its use as a combining form. A *Lexis-Nexis* search for *eco-* reveals that on October 27, 1998 London's *Daily Telegraph* ran a headline declaring "Energy Efficiency: Eco-homes return to the earth." Similarly, other eco-headlines read: "Eco-terrorists set major fire in attack on popular ski resort"; "German truckers battle 'eco-tax'"; and "Prairie Dog Symbolizes Plains Eco-War." Yet *eco-* is no longer solely rooted in the soil of environmental battles and has branched out and become a new line of marketing, as evidenced by the

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[1] The *OED2* defines *green* as follows: A. *adj.* 11. Of, pertaining to, or supporting environmentalism (esp. as a political issue);...The association of the colour *green* with the environmentalist lobby, esp. in Europe, dates from the early 1970s in West Germany, notably with the *Grüne Aktion Zukunft* Green Campaign for the Future, and the *grüne Listen* green lists (of ecological election candidates), both of which emerged mainly from campaigns against nuclear power stations.

"Ecomall" on the internet or the "Good Goods" mail order catalog which specializes in

eco-friendly "non-products" geared toward the consumers in the "eco-chic nineties."

Eco-chic? What is happening? Edward Abbey, green advocate and author of the

The Monkey Wrench Gang, would certainly be shaking his head in disgust: eco-friendly

consumer products for the eco-chic nineties? If the Green Party, the celebrators of Earth

Day, and proponents of eco-centrism like Abbey envisioned their work as promoting

green awareness, then perhaps they would consider *eco*'s position in the lexicon a small

victory; but they might also be puzzled by the all-things-eco credo which has proliferated,

for despite the high frequency of the bound morpheme *eco-,* these green rhetors might not

feel so victorious given the continued destruction of the Earth. That is, *eco-* no longer

solely refers to concern for the environment, primarily because savvy marketers have

exploited *eco*'s original green connotations and have affixed *eco-* to the front of their

products in an effort to sell more units, to increase consumption of their products--anti-

eco actions to say the least. As the saying goes: talk (or text) is cheap.

The *OED2* defines *eco-* as the "shortening of ecological, ecology, as in *eco-*

activist, one who actively opposes the pollution, or destruction by other means, of the

environment; *ecocatastrophe,* major damage to the environment, esp. when caused by

human activity."

The *OED2* also defines *ecocidal, ecocide, ecosystem, ecology,* and *ecofreak,* recording

the earliest written citation of the green *eco-* prefix as occurring on October 2, 1969,

when *eco-catastrophe* was used in the *New Scientist.* But it doesn't list *eco* as a free

morpheme. Other dictionary searches confirm this. For example, *Webster's New*

Collegiate Dictionary's entry for *eco-* reads: "comb[ining] form...1 : habitat or

environment <ecospecies>; 2 : ecology." So *eco-* remains a bound morpheme, according to the lexicographers. In terms like *eco-tourism, eco-catastrophe,* and *eco-activist,* the *eco-* prefix functions like a modifier, greening the root it is affixed to without changing the class of the word itself: *eco-tourism* is tourism linked to the local natural resources; *eco-activist* is one who campaigns in favor of the environment; *eco-catastrophe* is devastating damage to the environment. However, as *eco-chic* and *eco-nonproducts* reveal, *eco-* has moved away from its green connotation and into more commercial realms as *eco's* former green activism has become a new marketing slogan.

Eco- has been a combining form for nearly three decades; however, a search of the "General News" section of the *Lexis-Nexis* database for uses of *eco-* in major newspapers during April and December reveals the greening of the lexicon in the 1990s; and with 120 uses of *eco-* in majors newspapers in April 1998, it could be argued that *eco-* has never been more commonplace, that the language has never been greener, that environmentalists have "ecoed" the English language. A diachronic search for *eco-* using *Lexis-Nexis* starting in 1988 confirms this notion, as summarized in Table 1 and Figure 1.[2]

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[2] This search covers 23 international English language newspapers, all of which were archived into the *Lexis-Nexis* database by the end of 1989 (8 were added to the database between January and November 1989, making the counts for 1988 and April 1989 incomplete). The data includes other variables: when searching for *eco-,* the Italian semiotician/novelist Umberto Eco's name was frequently found, as were ECO acronyms for groups like the English Chamber Orchestra. These were tallied and subtracted from each

Table 1: Hits for *eco-* in selected *Lexis-Nexis* national newspapers, April and December 1988-1999

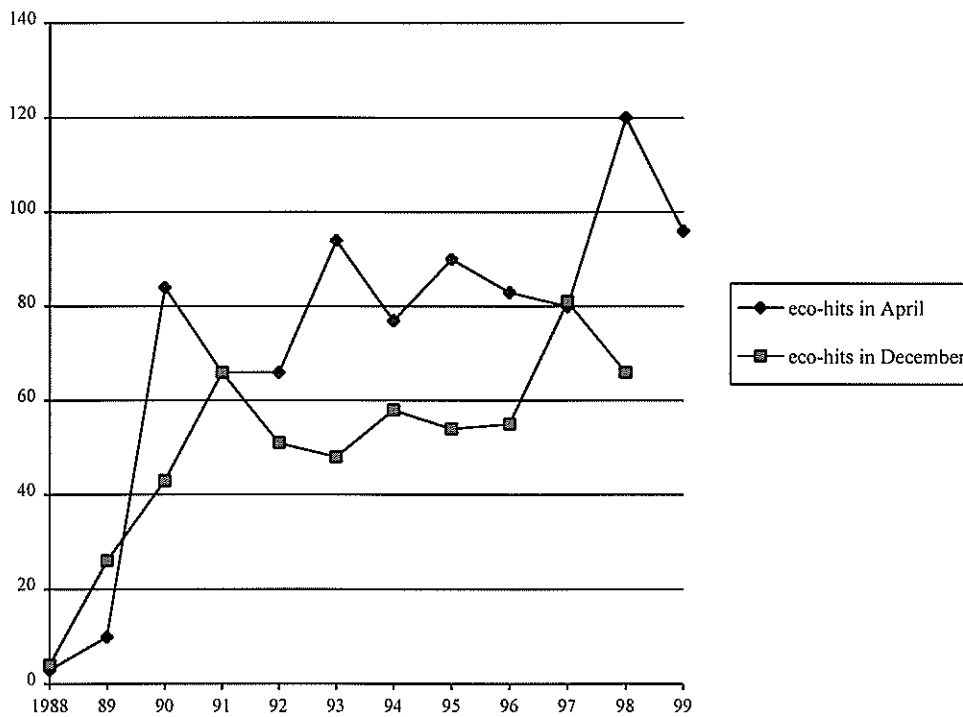| Year	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Eco-hits in April	3	10	84	66	66	94	77	90	83	80	120	96
Eco-hits in Dec.	4	26	43	66	51	48	58	54	55	81	66	

Fig. 1: Hits for *eco-* in selected *Lexis-Nexis* National Newspapers, April and December 1988-1999

Although the data covers only a small subset of the written language and is not infallible,

the numbers reveal that the appearance of *eco-* in selected major newspapers rises

month's *eco*-total. Similarly, the uses of *ecology, ecological,* and *eco-system* were not included in the totals. This methodology was also used when searching the *Seattle Times* corpus.

significantly after 1988, then stabilizes in the mid 1990s, and then appears to be

increasing again at the close of the decade. While the increase is not steady, with April's

hits fluctuating between the mid 60s and mid 80s and December's hits generally falling

between 40 and 60, the data nevertheless reflects the rise and subsequent stabilization of

eco- usage within the English lexicon in national newspapers.

A year by year search of a smaller newspaper corpus, the *Seattle Times*, reflects a

similar increased frequency of *eco-* in news reporting, as evidenced in Table 2 and Figure

2.[3]

Table 2: Hits for *eco-* in the *Seattle Times*, 1988-1998

Year	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Eco-hits	6	22	37	52	56	52	56	52	58	60	54

[3] Due to the sheer volume of the *Lexis-Nexis* newspaper corpus, the *Seattle Times eco-*search is more accurate. When cross-referencing the results from both searches, for example, in April 1990 the *Lexis-Nexis* search found 4 hits for *eco-*; whereas, the *Seattle Times* search found 6 hits for the same period. Thus, the smaller search appears more accurate.
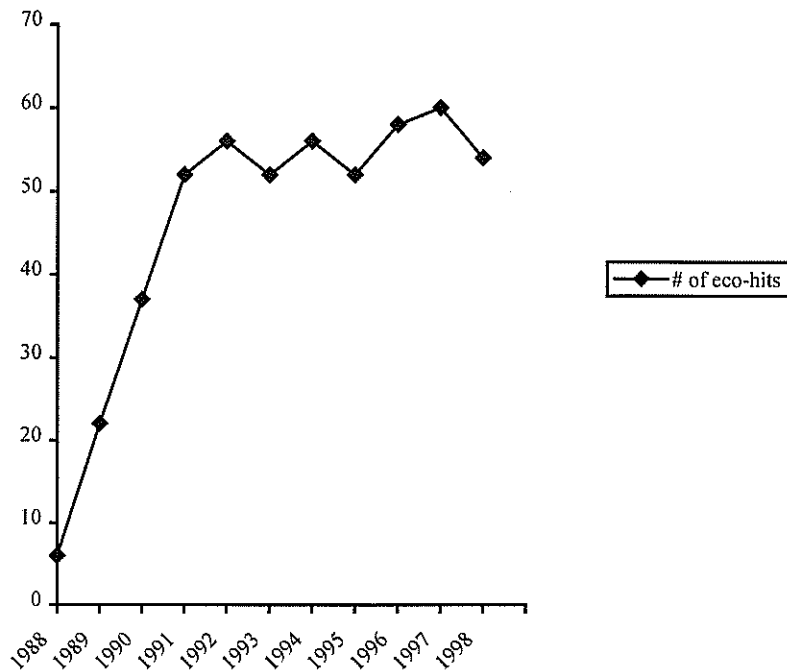
Fig. 2: Hits for *eco-* in the *Seattle Times*, 1988-1998

While usage stabilizes early in the 1990s (and with a bit more consistency than the *Lexis-Nexis* data), what is striking is the dramatic rise in frequency between 1988 and 1991, when *eco-* appearances climb from 6 to 22 to 37 to 52 hits in their respective years, and more than doubling between 1989 and 1991. This increase mirrors the growth in the *Lexis-Nexis* data for December 1989 to 1991, where the number of *eco-* hits grows from 26 to 43 to 66, again more than doubling between 1989 and 1991. While the data in both searches cannot and should not be considered totally systematic, it can be said that *eco-* began to take root in the English lexicon in the 1970s, and that *eco-* usage has blossomed in the English language newspapers since the late 1980s and early 1990s and shows no signs of disappearing, at least for now.

What sparked such an increase in the use of *eco-* during the 1990s? Speculation

points to several events, the most salient being the twentieth anniversary of Earth Day on

April 22, 1990. Many newspapers covered this event, and *eco-* often appears in the

discussions of the event. In the *Lexis-Nexis* newspapers search, 14 hits for *eco-* appear on

April 22, 1990--roughly 16 percent of the month's 84 *eco*-hits. The corpus research

suggests that Earth Day coverage accounts for a significant, if not overly excessive

number for the year.[4] Therefore, it could be argued that this international celebration

helped the environmental movement receive more attention in the media, which perhaps

promoted social awareness of green issues. In fact, in 1989, the year prior to Earth Day's

twentieth anniversary, the number of hits in the *Seattle Times* nearly quadrupled from

1988's 6 to 22. But the jump from 1989's 22 hits to 52 in 1991 seems more significant,

and might suggest that perhaps the twentieth anniversary of Earth Day boosted the

number of hits and elevated our eco-consciousness.

In the United States, several other events could have led to the greater frequency

of *eco-*, including the eco-catastrophic crash of the Exxon Valdez in 1989 and the passing

of the

Clean Air Act in 1990--perhaps George Bush's sole green act as President. Also, by the

fall of 1990, the controversy raging over the northern spotted owl peaked, when the U.S.

Fish and Wildlife Service listed the owl as a "threatened species," further igniting the

acrimony between loggers and environmentalists. Finally, a presidential election was

only two years away, and Democrats like Al Gore were agitating for greater

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[4] In the *Lexis-Nexis* search, minus Earth Day hits, April 1990 still has 70 *eco*-hits, larger than December 1990, as well as April and December 1991. Indeed, the number of Earth Day hits for *eco-* in 1990 might have been an anomaly: Earth Day 1991 has 8 hits for *eco-*; Earth Day 1992 surprisingly has no hits; Earth Day 1993 has 4, while Earth Day 1994 has 5 hits for *eco-*.

environmental protection. Certainly this list is short, incomplete, and highly speculative, but from a sociolinguistic perspective, it hints at some of the developments which might have contributed to the heightened environmental awareness in newspapers: an awareness which reached global proportions by 1992, when the first Earth Summit was held. In short, while present in written texts since the late 1960s, the use of *eco-* in major newspapers accelerated in the late 1980s and has not slowed down, as the results of the corpus search reflect.

The corpus data in Tables 1 and 2 confirms the dictionary's assertion that *eco-* is a bound morpheme. However, the *Lexis-Nexis* corpus search hints at the possible future for *eco-*, uncovering at least three convincing examples of *eco* as a free morpheme: a December 28, 1996 article by Christine Wheeler in London's *Times* with the headline "Eco Means Living with Tarantulas"; an April 19, 1998 article in the *New York Times* by Timothy Egan which reads "the critics of environmental restoration insist that the Endangered Species Act and other laws have elevated plant and animal concerns to a high altar of eco worship"; and an April 2, 1991 *San Diego Union-Tribune* headline which reads "Hey, there's an eco here!" Perhaps the morphemic liberation of *eco* has begun. In each case, *eco* seems to have become a freestanding noun. Wheeler's *eco,* functioning as the subject, appears to be an abstract noun. In Egan's article, it is not difficult to read *eco* as a noun, creating the

noun-noun compound "eco worship," analogous to the noun-noun compound "hero worship." Finally, the *San Diego Union Tribune's* headline employs the existential-there sentence, with *eco* functioning as the logical subject. Thus, the authors change the class of *eco,* employing it, not as a bound morpheme in its traditional combining form, but as a

free morpheme and a noun, possible (and perplexing) milestones in the greening of the

English lexicon. The question remains: what is an *eco*? As a noun, *eco* retains its green

connotations, sometimes specifically denoting something or someone concerned with the

preservation of the environment, and sometimes more abstractly referring to the

environment in general.

But why stop the liberation of *eco* at noun? How about *eco* as a verb? This, too,

might happen as its meaning is conducive to a functional shift. (e.g., *Before the couple*

moved in, they ecoed their new house: adding insulation in the attic, installing water-

efficient shower heads, and starting a compost pile. When the United States finally ecoes

its environmental reputation by reducing its energy consumption, only then can

Americans say that they are green.). It is easy to imagine some other predicate

possibilities for *eco*.

As a bound morpheme, the use of *eco-* is surprisingly diverse. *Eco-*

congregations, eco-groovy, eco-socialism, Eco-Glasnost, eco-spirituality, eco-bag-lady,

eco-baby, eco-feminist, eco-efficient, eco-investor, eco-erotic, eco-lodgings, eco-musee,

eco-missionaries, eco-perfect, eco-appropriate, eco-gloomies, even eco-weenies: these

are only some of the more curious examples of the all-things-eco credo, and clearly the

lexicon has grown richer because of it. Or consider these lexical items taken from *Sierra*

Magazine: *eco-kosher* and *eco-theology*. Indeed, the neologistic possibilities for affixing

eco- to the front of a word seem infinite (and just might be since there was a rare

opportunity to witness a performance by "*Eco Elvis*" at San Diego's 1995 Earth Fair).

However, as eco-neologisms become more common, semantically *eco-* has

clearly undergone generalization, as it now encompasses the marketing of so-called green

products alongside the green message and the environmental advocacy of its earlier uses.[5,6] This is especially apparent in the commodification of *eco-* in business and advertising. Just like "organic" or "natural" items, so-called *eco-friendly* products are prevalent. The Ecomall website sells eco-diapers. The Eco-lobster website assures the consumer that any trapped female lobsters are released so that lobster reproduction can continue. Moreover, Esprit introduced its "Ecollection," an environmentally responsible line of women's clothing. And do not forget the non-products sold by Good Goods in the eco-chic nineties. The message is clear: *eco-* sells. And this is not a recent marketing phenomenon, as the 1972 citation in *American Speech* (47.3) of the *Eco-Bag* and *Ecoplastics, Inc.* reveal. However, many of these slogans obscure the original greenness of *eco-*. Certainly some products are more environmentally responsible than their counterparts.[7] Nevertheless, eco-citizens reduce consumption and limit the number of products they buy. *Eco* is much more than simply switching brands.

A curious paradox: the English language has never been greener; the Earth has never been more polluted. Despite the ecoization of English, there have never been more people, more automobiles, more clearcuts, and more endangered species on the planet. However, if language reflects social awareness and anticipates social progress, it is possible

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[5] Oxymorons are beginning to appear; witness *USA Today*'s listing of ten "eco-driving tips" on December 23, 1990.

[6] Depending on one's perspective, it could be argued that both amelioration and pejoration have occurred with *eco-*. A green party member might argue that pejoration has occurred, particularly in relation to the ubiquitous marketing of eco-products. Conversely, some industry people might argue that amelioration has occurred, that the more generalized associations of *eco-*, especially in relation to eco-products and eco-business, have created better associations for *eco-*.

[7] The Eco-Chill refrigeration unit is an example of an eco-product. Produced in Iceland and supported by Greenpeace, these units reduce ozone emissions.

that the Earth's condition might improve. Perhaps when *eco* becomes a verb there will be

fewer endangered species and more trees. One suggestion, which Edward Abbey and the

founding Green Party members might agree with, is to reinsert the green *eco-* back into

economy: an environmental and fiscal union which balances ecosystems and economic

systems. Perhaps then the linguistic changes will amount to something more than cheap

talk.

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Response to Ura (1994)

"Varieties of Raising and the Feature-Based Bare Phrase Structure Theory"

Anna Dailey-McCartney, Victor Eskenazi, Chia-Hui Huang

{amdailey, vesken, hhuang}@u.washington.edu

0. Introduction and Overview

The widely held view concerning NP-movement is that an NP cannot move to a higher subject position across another distinct intervening subject NP. This restriction, known as a ban on superraising or illicit NP-movement, is exemplified in (1). Sentence (1a) is an instance of one-step NP-movement, and (1b) an instance of successive-cyclic NP-movement. (1c) is ruled out in violation of this ban on superraising although the resulting A-chain satisfies a Case requirement.

(1)   a. It seems that [John] is believed [t] to be a Democrat.

b. John seems [t] to be believed [t] to be a Democrat.

c. *[John] seems that it is believed [t] to be a Democrat.

(1a) is an instance of one-step NP-movement, and (1b) an instance of successive-cyclic NP-movement. (1c) is ruled out in violation of Ban on Superraising.

Lasnik's (1985) binding approach, Rizzi's (1990) chain-theoretic approach, and more recently, Chomsky's (1995) derivational approach all argue for a ban on superraising. Chomsky's MLC requires that an element which undergoes movement in the course of derivation be the closest one to the target position. Hence, any intervening distinct NP always invokes a violation of the MLC for another NP that attempts to cross over it unless head movement expands the checking domain. However, Chomsky leaves open the question of whether superraising is ever allowed, citing Ura's (1994) work on a correlation (in languages that allow

multiple specifier positions) between multiple specifiers and apparent cases of superraising. The extra specifier (IP_1 in (1d)) can serve as an escape hatch for superraising; this crucially relies on Chomsky's definition of equidistance (here, IP_1 and IP_2 are equidistant from IP_3). In contrast, the analysis of superraising in Rizzi (1990) totally disallows the possibility of superraising, even if multiple specifiers are assumed.

As is well attested, superraising is impossible in all Germanic and Romance languages, but the empirical issue is this: Do natural languages never have superraising? Ura (1994) claims to falsify the current syntactic accounts of the ban on superraising. He claims that languages such as Arabic, Chinese, Indonesian, Persian, and Japanese do exhibit superraising.

If they are not disproved, Ura's reported cases of superraising pose a serious challenge to the standard account of the ban on superraising. However, we conducted field research with native informants of several of the languages discussed by Ura and in each case, his analysis turns out to be inaccurate. Since we are able to show that none of Ura's examples are genuine cases of superraising, the universal ban on superraising can still be upheld. Confirming the existence of superraising is clearly important, since even a few solid cases would necessitate radical rethinking of the current theory of locality and movement. Our findings so far suggest the need for further investigation before superraising can be accepted.

Ura provides an analysis of how superraising could be possible. He claims that in languages such as Indonesian and Arabic, there is an extra specifier position in the non-finite clause which can be used as an escape hatch to make superraising possible. Let's look at the structure in (2).

(2) $[_{IP}$ John$_i$ seems $[_{CP}$ that $[_{IP1}$ t_i $[_{IP2}$ it is believed $[_{IP3}$ t_i to be a Democrat $]]]]$

The extra specifier (IP_1 in (2)) is served as an escape hatch for superraising; this crucially relies on

Chomsky's definition of equidistance (here in (2) , IP_1 and IP_2 are equidistant from IP_3). In contrast to this, the analysis of superraising in Rizzi (1990) totally disallows the possibility of superraising, even if multiple specifiers are assumed.

In this paper we will examine four of the eight languages cited in Ura's paper. They are Indonesian, Arabic, Persian and Mandarin Chinese. We will show that contrary to his claim, these languages do not permit superraising.

1.   Indonesian

Let's start with Ura's example of Indonesian in (3).

(3a)   Mereka meng-angap [bahwa saja beri-kan surat itu kepada Tini].
        they   TRANS-believe comp I   give-BEN letter the to Tini
        'They believe that I gave the letter to Tini'

(3b), which has the same meaning as (3a), the object of the embedded clause *Tini* is moved to the subject position of the matrix clause.

(3b)   Tini$_i$ di-anggap   [bahwa saja beri-Ø surat itu t$_i$].
        Tini PASS-believe   comp I   give   letter the
        'Lit. Tini$_i$ is believed that I gave t$_i$ the letter. (same meaning as (a))'

Our Indonesian informant judged (3b) to be ungrammatical; this is in fact, predicted by Rizzi (1990) and Chomsky (1995) since the movement of *Tini* in (3b) violates both the Relativized Minimality Condition and Minimal Link Condition. However, let us consider the possibility that some speakers accept (3b) and try to determine what its structure would be. We will first establish that *di-anggap*, 'believe' as it's shown in (3), is a raising predicate.

(3c)   Itu   di-anggap   (bahwa)   Mary   mem-ukul   John.

It   pass-believe   (that)   Mary   trans-hit   John.

'It is believed that Mary hit John'

(3d)   Mary   di-anggap   mem-ukul   John.

Mary   pass-believe   trans-hit   John.

'Mary is believed to have hit John.'

(3e)   John   di-anggap   di-pukul   oleh   Mary.

John   pass-believe   pass-hit   by   Mary.

'John is believed to have been hit by Mary.'

Examples (3c-e) are all semantically equivalent and this suggests that *di-anggap* is indeed a raising predicate. In all these sentences *Mary* and *John* bear the same theta-relations, while *di-anggap* assigns no external theta-role.

It is important not to confuse the use of *di-anggap* in (3a-e) above with the one shown in (3f). Here in (3f), the surface subject, John, has undergone pseudopassivization. Example (3g) which has the same underlying structure as (f), but in this case the internal DP argument of *di-anggap* John, has remained in situ. The ungrammaticality of (3h) shows that the relationship between the surface subject and the object of 'kiss' is not derived via movement.

(3f)   John$_i$ di-anggap   bahwa Mary   cium   dia$_{i/*j}$.

John   pass-believe   that   Mary   kissed him

'It is believed of John$_i$ that Mary kissed him$_{i/*j}$.'

(3g)   Itu di-anggap tentang John$_i$ bahwa Mary cium dia$_{i/*j}$.

It pass-believe about John that   Mary kissed him.

[same meaning as 3f]

(3h)   *John di-anggap   tentang John bahwa Mary cium.
        John pass-believe about John that Mary kissed.
        'It is believed of John that Mary kissed (him)."

Now compare (3h) to Ura's example (3b) in page 1 of your handout. It appears that his informant allows the goal argument of *give* to be implicit. Furthermore, in order for the sentence to be interpretable, the matrix subject *Tini*--which is the internal argument of *di-anggap*--must be understood as being coreferential with the implicit argument of *give*. This is demonstrated by the coreference facts in (3f) and (3g).

The supporting evidence for pseudopassivization structure we are proposing here comes from the minimal pair in (3i-j). (3j) has the same meaning as (3i), with the difference on the main verb. (3j) is ungrammatical because, unlike *beritahukan* in (3i), the main verb of (3j) *jelaskan,* does not subcategorize for an *about*-phrase. *Beritahukan* in (3i) has roughly the argument structure of *inform* in English, whereas *jelaskan* in (3j)has that of *explain.*

(3i)   Tini$_i$ diberitahukan kepada saya bahwa dia$_i$ sakit.
        Tini$_i$ PASS-explain to   me COMP she$_i$ sick.
        'It was explained to me about Tini that she was sick.'

(3j)   *Tini$_i$ dijelaskan   kepada saya bahwa dia$_i$ sakit.
        Tini$_i$ PASS-explain to   me   COMP she$_i$ sick.
        (same meaning as 3j)

To summarize, because Ura's Indonesian example can be accounted for as a pseudopassivization structure, it is unnecessary to posit superraising based on this data.

2.   Arabic

Moving on to Arabic, Ura's examples of Moroccan Arabic are listed under (4).

(4a)   Ttshab-li   [belli šaf-Ø-ha   muhend mmi   fsefru]

   Seemed-3sg-to-1sg comp saw-3sgm-3sgf Mohand mother-1sg in-Sefrou.

  "It seemed to me that Mohand saw my mother in Sefrou."

(4b)   Ttshab-et-li mmi_k [belli šaf-Ø-ha   muhend t_k fsefru]

  seemed-3sg-f-to-1sg   mother-1sg   comp saw-3sgM-3sgF Mohand   in-Sefrou

  Lit. My $mother_k$ seemed to me that Mohand saw t_k in Sefrou.

  (Same meaning as (4a)).

   Ura claims that the example (4b) from Moroccan Arabic shows superraising. However, according to our informant this sentence is ungrammatical. In fact, we were unable to even find examples of regular subject to subject raising in Moroccan Arabic; our informant rejected all potential candidates. This suggested to us that raising predicates in Moroccan Arabic select only CP and not a bare nonfinite IP. For this reason, we concentrated on the Cairene dialect of Arabic, which did have pairs like (4a) and (b), this is shown in (5).

(5a)   You-takad   en Mohamed shaf-Ø om-my.

  Psv-believe 3sg. that Mohamed see-3sgM mother my

  'it is believed that Mohamed saw my mother.'

(5b)   Om-my you-takad   en Mohamed shaf-Ø **haa**.

  mother-my Psv-believe3sg that Mohamed see-3sgM-3sgF

  'My mother is believed that Mohamed saw (her).'

The main verb, *You-takad* (be believed) in (5) behaves like a raising predicate in Cairene Arabic, and consequently, (5a) and (b) are synonymous. The most important feature of (5b) is the pronoun *haa*. So in (5b), *haa* comes after the verb *shaf*. This element is referred to in the Arabic literature as a 'returning', or resumptive pronoun. Fassi Fehri (1993) argues that this resumptive pronoun incorporates into verbs and prepositions. It

appears in contexts where resumptive pronouns are expected, that is, in A-bar constructions illustrated in (6):

(6)   N-nisaa?-u laa y-ubaalii ?ahad-un bi-**haa**.   (Fassi Fehri (1993))
       the woman not 3 care one-nom about-her
       'As for the woman, nobody cares about her.'

Crucially, *-haa* never appears in positions where Case isn't assigned, such as the object of the passivized verb in (7):

(7)   *Ommy et-shaf-tet-**haa**
       Mother-my Psv-see-3sgF-3sgF
       'My mother was seen.'

This is no surprise, since resumptive pronouns are known never to appear in constructions involving only A-movement. Therefore, we assume the apparent case of superraising in (5b) in page 2 of your handout, where *-haa* appears as the object of 'see', is actually an example of topicalization. An example structurally similar to (5b) appears in (8), again demonstrates the resumptive strategy in a topicalization structure:

(8)   Om-my   you-takad   en Mohamed shaf   asdequa?a-**haa**
       mohter-my Psv-believe 3sg that Mohamed see 3sgM friends-her
       'My mother it is believed that Mohamed saw her friends.'

Here *haa* is understood as coreferential with 'my mother', *haa* is no longer attached to the verb *shaf* because an overt DP object has taken its place. In addition to that, example (8) establishes that *haa* can be related to the matrix subject *ommy* without movement occuring.

To sum up, Ura's examples give the IMPRESSION that *haa* is simply an object marker whose appearance is independent of whether the object is topicalized, as in (5b).

This is misleading; a proper analysis of this construction reveals that NEITHER superraising NOR any other kind of A-movement is involved.

We will now consider a couple of languages where our informants simply disagreed with the grammaticality judgments given by Ura. The first such example is Persian. They are listed under (9).

3.   Persian

In this case, Ura claims that (9b) is derived from (9a):

(9a)   In bæ?id æst [ke   æli ketab-ra   be Hæsan, be-dæh-æd].

It unlikely is COMP Ali   book-ACC to Hasan SUBJUNCTIVE-give-3SG.

'It is unlikely that Ali gives Hasan the book.'

(9b)   Hæsan₁ bæ?id æst [ke   æli ketab-ra   t₁   be-dæh-æd].

Hasan unlikely is COMP Ali   book-ACC   SUBJUNCTIVE-give-3SG.

Lit. Hasan₁ it is unlikely that Ali gives t₁ the book.

[same meaning as 9a]

However, our Persian informant found (9b) is strongly ungrammatical, indicating that superraisiing doesn't exist in Persian. Ura also gives examples of topicalization in Persian, this is shown in (9c) and (d):

(9c)   *Hæsan₁, in bæ?id æst [ke   æli ketab-ra   t₁   be-dæh-æd].

Hasan   it unlikely is COMP Ali book-ACC   SUBJUNCTIVE-give-3SG.

'Hasan₁, it is unlikely that Ali gives t₁ the book.'

(9d)   Hæsan_i, in bæ?id æst [ke æli   ketab-ra *be* t_i   be-dæh-æd].

        Hasan it unlikely is COMP Ali   book-ACC to   SUBJUNCTIVE-give-3SG.

        'Hasan_i, it is unlikely that Ali gives the book to t_i.'

        (Ura' informant's judgment)

The only difference between (c) and (d) is the presence of the preposition *be* in (d). Here our informant had the reverse grammatical judgments for (c) and (d); in other words, our informant found contrary to Ura informant's judgment , (9c) is grammatical and (9d) is ungrammatical. (9d) is apparently out due to a prohibition on preposition stranding.

4.   Mandarin Chinese

The last language we are examining in today's presentation is Mandarin Chinese. They are shown in (10). (10b) has the meaning as (10a), according to Ura's paper.

(10a)   Keneng [Zhangsan reng-le   nei   kuai rou   gei ta].

        Possible Zhangsan toss-ASP that piece meat   to he

        'It is possible that Zhangsan has tossed that piece of meat to him.'

(10b)   Ta_i keneng   [Zhangsan reng-le   nei   kuai   rou   t_i]

        he possible   Zhangsan toss-ASP   that   piece meat

        Lit. He_i is possible that Zhangsan has tossed t_i that piece of meat.

The status of *keneng* (possible) as it's shown in (10a and b) as a raising predicate is still highly controversial, this may just be an adverb in which case it means 'possibly'. But assuming that movement does occur, we feel that the apparent case of superraising in Mandarin are actually topicalization.

Ura's example (10b) is a case of movement of the indirect object. However, our native speaker judgements (including that of myself) show that (10b) is strongly

ungrammatical. Interestingly, it appears that any sort of movement of the indirect object from the embedded clause is disallowed, as it is shown in (10c), which has a non-raising predicate.

(10c)   *Leetsu$_i$ [Zhangsan chiau Wangwu chi   shing t$_i$]
        Leetsu Zhangsan ask   Wangwu send   letter
        Lit. Leetsu, Zhangsan asks Wangwu to send the letter.

Notice that the movement of indirect object is also not possible when the preposition is moved with the NP indirect object. This is shown in (10d).

(10d)   *Gei Leetsu$_i$ [Zhangsan chiau [Wangwu chi   shing t$_i$]]
          to Leetsu Zhangsan ask   Wangwu send letter
        'To Leetsu, Zhangsan asks Wangwu to send the letter.'

Here we see that the preposition *gei* 'to' is moved together with the NP indirect object, and the sentence is still ungrammatical.

If (10b) does involve topicalization, we predict that it should not be possible to front an indefinite NP. There is a general semantic restriction on topicalization requiring that the fronted element be definite. Unfortunately, Ura did not provide examples of superraising with indefinite subjects in Chinese, or for that matter, any of the languages he discussed in his paper, therefore we cannot test this prediction at present.

5. Conclusion

In conclusion, if Ura is correct and superraising does exist, then this will pose a serious challenge to the standard account of the ban on superraising. However, we looked at four of the languages Ura discussed, and in each case, we are able to show that Ura's examples were in fact not genuine cases of superraising.

We believe that confirming the existence of superraising is clearly important, since even a few solid cases would necessitate radical rethinking of the current theory of locality and movement. Our findings so far suggest the need for further investigation before superraising can be accepted.

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The Mutual Exclusivity Bias in

Children's Bilingual Vocabulary Acquisition

Donna Bosworth Andrews

dandrews@u.washington.edu

0. Introduction

The purpose of this study is to examine the bilingual child's use of Mutual Exclusivity in the acquisition of two languages. Mutual Exclusivity (ME) is one of several word-learning strategies that children may use to help them discern the referents of new words. The ME hypothesis (Markman and Wachtel (1988)) claims that a child will accept only one name for any given object. This helps children learn new words by eliminating objects for which the child already knows a name as possible referents of the new word.

For example, imagine that a child knows the word *pen* but not the word *envelope*. Imagine also that a pen and an envelope are lying on a table nearby. If the child's mother asks her to "please bring me the envelope," the child will be able to comply. Mutual Exclusivity stops her from assuming that her mother might be referring to the pen. Thus ME helps the child discern the particular referent in this case, and thereby helps her learn the new word, *envelope.*

On the other hand, such an assumption does not accurately reflect linguistic fact, and children encounter many violations of ME. For example, they may hear a particular dog referred to as "dog," "pet," "animal," "Louie," "furry," or "brown." If ME is a word learning strategy that children use, then it must be overcome at some level in order to learn synonyms (such as *couch* and *sofa*), subordinate and superordinate words (e.g., *Schnauzer* and *animal*, in addition to *dog*), as well as words denoting parts and attributes. How children effectively utilize and override such an assumption is the subject of much current research.

It is likewise unclear how children growing up with two languages utilize ME in their word learning process. On average, children growing up bilingual probably encounter double the number of ME violations that monolingual children do, simply by virtue of the fact that, even at

the basic level of vocabulary acquisition, everything has two different names, one in each language. It may be that the linguistic experience bilingualism provides makes bilingual children more willing or able than monolingual children to suspend ME, both within and across languages. This study looks at evidence for ME across languages in bilingual children who are learning their two languages from different caretakers in different settings. Specifically, do children growing up bilingual learn proportionally more translation equivalents than they do singlets in their non-dominant language?

This paper is organized as follows: Section 1 outlines the theoretical problem of language acquisition in general and lexical acquisition in particular, and introduces the mechanisms which have been proposed to explain it. Section 2 discusses the specifics of the Mutual Exclusivity hypothesis: Section 2.1 explains the importance of ME and reviews the relevant literature, and Section 2.2 briefly outlines the tangential concern of the ontological status of ME. Section 3 relates the importance of ME specifically to bilingual language acquisition. Section 4 explains the design of the study, the methodology, and composition of the subject pool: Section 4.1 outlines the design and goals of the study, 4.2 explains the use of the particular research tool used here, the Communicative Development Inventory, and 4.3 discusses some of the benefits and drawbacks of observational studies. Section 5 elaborates two ways in which the data were classified for analysis: Section 5.1 discusses Mean Month of Acquisition and Section 5.2 discusses word classes. Section 6 explains the data analysis using hypothetical examples. Section 7 details the results of the study for the three subjects. Section 8 is discussion and Section 9 offers further possibilities for research.

1. The "Logical Problem" of Acquisition

As anyone who has tried to learn a second language knows, language learning is a formidable task. One of the fundamental questions in linguistics is how children can learn their native language so effortlessly and so well. The components of this question are well known. Children receive no formal native language instruction and yet they learn to speak perfectly. The speech children hear around them does not always entirely adhere to the grammatical rules of the language, yet all children in a language community grow up understanding and using the same grammatical rules. Children rarely receive overt correction of their linguistic mistakes

("negative evidence"), and yet they eventually eradicate those mistakes and become full-fledged speakers of the language (Chomsky (1959), (1965)). They complete the majority of this learning before reaching age 5.

Language learning is a multi-faceted task. Children need to learn the sounds of their native language (phonetics) and how the sounds combine in use (phonology). They must learn not only to combine the sounds appropriately to form words (lexicon), but also what the words refer to in the real world (semantics). In addition, they must learn how the words they have learned fit into a hierarchically ordered structure to express full thoughts (morphology and syntax). The building of the lexicon is therefore a central issue in language acquisition. The emergence of the "first words" signals that a child has reached a new stage in linguistic development. Research has focused, for example, on the composition of children's early vocabularies, (e.g., Bates et al (1994)), on children's use of words (such as overextending and underextending the meanings of words (e.g., Clark, 1987)), and on how children may use the meanings of words to infer the structure of the language (e.g., Pinker (1987)).

A child's ability to learn inductively his or her native language is all the more amazing when one considers that most children of this age are not capable of inductive reasoning in other areas of learning. Young children do not form and revise hypotheses based on observation – this is a skill they will continue to develop in the coming years.[1] Therefore the ease with which children learn language cannot be attributed to general cognitive skills. Other, language specific, mechanisms must be at play (MacWhinney, (1987)).

The proposed mechanisms for vocabulary acquisition are a set of assumptions children may start with, assumptions *specifically about the nature of words,* which help them approach the task of building a lexicon. For example, children may initially assume that new words refer to objects rather than to actions or qualities. This default assumption will not always be correct, but the fact that children initially tend to favor nouns over other classes of words suggests that they look for nouns first.[2] This "object assumption" (Golinkoff, Mervis and Hirsh-Pasek

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[1] This commonly-held assumption has fueled much acquisition research over the years, but for the opposite point of view, see Gopnik and Meltzoff (1997)

[2] This long-held belief about noun vs. non-noun acquisition has been challenged by Tardif (1996) and others doing research into the acquisition of languages other than English. The reasons English children acquire nouns first while Chinese children tend to acquire a much higher percentage of verbs are largely unstudied at this point.

(1994)) is not enough even to acquire all object names though, because any new word a child hears may have numerous possible referents, and the task of deciding which name refers to which object is hardly trivial. For example, when a mother holds out a cup of juice and says "Juice," the child might attach that label to the juice, to the cup that holds the juice, or to the handle attached to the cup, (setting aside the additional possibilities that the word might refer to the color or consistency of the juice or cup, or to the action of handing an object over.) That children most often pick the correct referent for a word is nothing short of remarkable. It is therefore suggested that the child has at least three other default assumptions:

- Taxonomic Assumption: Children may assume that words refer to *classes* or *types* of objects rather to only specific instances of objects. Thus when a child learns the word *cup* he is likely to assume that the word refers to a *class of items* sharing cup-like characteristics rather than assuming that *cup* refers only to his own blue cup. (Markman and Hutchinson (1984))

- Whole Object Assumption: Children may assume that words refer to whole objects rather than to their parts or attributes. Thus children assume that *cup* refers to the entire object rather than to its color or texture or to just its handle (Markman and Wachtel (1988))

- Mutual Exclusivity Assumption:[3] Children may assume that only one name can be attached to any given object. Thus once a child learns *cup* he is unlikely to assume that the word *bowl* refers to that same object (Markman and Wachtel (1988))

These three assumptions are thought to aid vocabulary acquisition by operating under a system of checks and balances, overriding each other when evidence suggests it. For example, imagine a child is handed his *cup* and told to hold the *handle*. Based on the ME Assumption, he knows *handle* cannot refer to the entire object, because the object is a *cup*. He therefore overrides the Whole Object Assumption and chooses some part of the cup as the referent of *handle*. On the other hand, imagine a child who sees bears and lions at the zoo. When her father refers later to "all the *animals* we saw," she forms a new category by overriding ME with the Taxonomic Assumption. By allowing lions and bears to have two names (the specific name, as well as *animal*) she incorporates the superordinate word *animal* into her vocabulary. Thus by maintaining these three Assumptions in a state of constant tension with each other, children are

able to induce word meaning largely correctly on the first try. There is research evidence that children make use of all three of the Assumptions. Since it is ME specifically which concerns us here, the remainder of this paper will concentrate on this principle.

2.0 Mutual Exclusivity

This section describes the ME hypothesis and elaborates some of the research that provides evidence of such a bias.

2.1 Mutual Exclusivity in Vocabulary Acquisition

Mutual Exclusivity is a default assumption children may be using to distinguish the referent of a new word. It is a strategy, therefore it is not something that can be directly observed. However, the effects of ME can be observed. Merriman and Bowman (1989) detail four different ways in which ME may manifest itself in children. These are:

- Disambiguation effect: Presented with a novel label in the presence of both a known and an unknown object, children should choose the unknown object as the referent of the new label.

- Restriction effect: Presented with a novel label for a new object, children might avoid extending the new name to familiar objects for which a name is already known.

- Correction effect: Presented with a novel label for a known object, children might "correct" their previous knowledge by adopting the new name for the object.

- Rejection effect: Presented with a novel label for a known object, children might reject the new name outright ("e.g., no it's not a theeri, it's a tiger")

Many studies have tested children's reliance on ME using one or more of Merriman and Bowman's "effects" as evidence. Markman and Wachtel (1988) set up a disambiguation experiment in which two objects were presented to 3- and 4- year-olds, one which was familiar and had a known label, and another which was unknown. The researchers then said either "show me the X" (in which X was a novel label), or "show me one." If children honored ME, those

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[3] Different researchers have proposed several variations of Mutual Exclusivity, such as the Novel Name Nameless Category Assumption (Golinkoff, Mervis and Hirsch-Pasek (1994)) or the Principle of Contrasts (Clark (1987)) However, these assumptions are very similar and the differences need not concern us here.

who had heard a new name should apply it to the unfamiliar item, while children who were not given a new name should have been random in pointing to the known or new object. Markman and Wachtel found that this was exactly the result they obtained. In a second experiment, Markman and Wachtel (1988) showed children a familiar object with a known name and offered a novel name for the object. Each of the objects in this study had a prominent part. Other children were shown unfamiliar objects and offered novel names. The researchers found that children who heard a novel name in conjunction with a familiar object with a prominent part applied the name to the prominent part rather than to the whole object, whereas children who were shown unfamiliar objects applied the name to the whole object. These results show that ME overrides the Whole Object Assumption to help children learn vocabulary encoding part-whole distinctions.

Au and Glusman (1990) report 6 studies testing both children's and adults' reliance on ME. The first 3 studies tested whether or not children and adults honor ME more within a category level (i.e., basic level, subordinate, superordinate) than they do across level boundaries. Subjects were shown stuffed animals and taught a novel name for one of the animals (e.g., "mido"). They were then asked to point to other examples of a second novel name. Given two novel names, both children and adults hypothesized that both names are basic-level labels for items and pointed to the type of animal that had not been labeled "mido;" that is, they tended to observe ME. However, when only one of the labels was novel and the second was a known superordinate category name (in this case "animal"), all the adults and all but one of the children accepted both names for the same referent. This demonstrates that both the basic level and ME are default assumptions for both children and adults, but given compelling evidence that one of these default assumptions is incorrect, the other can override it. In the third of the three studies children were again shown stuffed animals, this time including two different types of dog, and the novel name ("mido") was applied to one of the two types of dog. Again, when asked to pick exemplars of a second novel name (e.g., "theri") children tended not to point to the dog labeled "mido." This shows that even when the novel names are clearly from the subordinate level, children prefer to observe ME. The authors take this as evidence that ME is observed within a category level regardless of whether it is basic or not, but that ME can be easily overridden across level boundaries.

Studies which have included age as a variable (Merriman and Bowman (1989), Merriman and Kutlesic (1993), Davidson, Jergovic, Imami and Theodos (1997)) have shown that older children show a stronger reliance on ME than younger children. For example, Merriman and Bowman (1989) tested 2, 2 ½, and 3 ½ year olds, and then 2 ½ and 4 year olds on their restriction and disambiguation effects. They showed pictures of known objects (e.g., a truck) and hybrid objects (e.g., an object having characteristics of both a truck and a car) and asked the children to "point to an X" or "point to a Y" (where X is the English name of a known object and Y is a nonsense word such as "jegger"). If the children disambiguated, they should choose the hypbrid object rather than the known object as an example of a "jegger." If they restricted, they should not extend the word "jegger" to include the known objects. In the first experiment, only 3 year olds showed any tendency to disambiguate, and none of the children showed a restriction effect. In the second experiment, 2 ½ year olds showed a slight ME bias while 4 year olds showed a strong reliance on ME, and were even able to articulate this preference. For example, when asked why they pointed to a novel object as an example of a novel name 59% of the time they answered along the lines "because the other one is a key," whereas the 2 ½ year olds only offered such explanation 10% of the time (Merriman and Bowman (1989); 104). These results (and others reported in the same monograph) prompt Merriman and Bowman to state that children under 2 do not entertain an ME bias, but learn it as they get older.

However, since children are already learning to attach labels to objects much earlier than age 2, such an ME assumption (as well as the Taxonomic and Whole Object assumptions) might be even more helpful to younger children. Markman (1990) cites evidence that 18-month-olds do adhere to the Taxonomic Assumption; we might thereyfor expect that they also adhere to ME. Several studies (Liittschwager and Markman (1994), Woodward and Markman (1991)) criticize studies showing that children under 2 lack an ME bias by claiming that the tasks involved in those studies were inappropriate for young children (because, e.g., the experiment took too long to hold the child's interest, or required children to remember complicated instructions) and therefore did not accurately assess of the children's reliance on ME. Liittschwager and Markman (1994) looked for evidence of ME in children age 16-24 months. Children were taught second labels for known objects, as well as both first and second labels for unfamiliar objects. The effort with which children learn second labels was judged in comparison to the effort it took

to learn first labels. Both 16-month-olds and 24-month-olds had trouble learning second labels for objects, but 24-month-olds exhibited this difficulty only when the task involved learning two second labels; learning one second label (in violation of ME) caused no more difficulty than learning a new word for the first time. The authors interpret this finding as evidence that overtaxing the processing capacity of the child may increase their likelihood to rely on ME, but that ME is certainly available to 2-year-olds.

Merriman and Stevenson (1997) also conducted experiments with 24- and 25-month-olds listening to stories. In the stories, half the children heard a novel name attached to an atypical exemplar of a familiar object (e.g., a car-like object with long axles was called a "jegger"). The other children heard a story in which the atypical exemplar was not labeled at all but called "it". When asked to select examples of the familiar noun ("car") from a group of objects, children in the first condition tended to avoid selecting the atypical exemplar from the story (i.e., they showed the restriction effect), whereas children in the second condition did not avoid it. Thus under conditions appropriate for the age group, 2-year-olds do indeed show evidence of ME.

2.2 Strategy vs. Constraint

An important subtext in many ME studies concerns the debate over whether ME is a biological constraint (i.e., hard-wired into the brain) or a learned strategy. The correlation between an increased reliance on ME and increased age is generally seen as evidence that ME is not innate but learned over time, older children having "learned" to use an ME assumption more effectively than younger children. A counterargument goes that ME (and by extension, the other assumptions mentioned above) is a biological constraint which can be overridden when other factors are present so the fact that children can override these constraints is not evidence that children do not initially, or usually, adhere to them. Woodward and Markman (1991) elaborate the concept of biological constraints as "probabilistic biases" rather than rigid, inviolable laws, and state that the three main word learning assumptions (Whole Object, Taxonomic, and Mutual Exclusivity) are best understood in this way. Furthermore, even if it could be shown that children under 2 do not use ME, this is not reason enough to assume that ME is not a biological constraint, as late-emerging biological characteristics (such as puberty) are well-known.

MacWhinney (1991) counters that Woodward and Markman have not advanced the discussion of ME, but rather made it unfalsifiable empirically, if evidence that children are not adhering to Mutual Exclusivity cannot be taken as evidence against the constraint. He cites his own "learning account" that what is innate is not any particular constraint but a "principle of competition," as words vie with each other for semantic space. The basic Assumptions of vocabulary acquisition under this model would be learned strategies to help children referee the competition that language acquisition leads to.

It is not my purpose in this paper to sort out which of these arguments are right, although I agree with MacWhinney that if instances of non-adherence to ME cannot be counted as evidence against ME, then ME becomes untestable. In fact, given our current understanding of the brain and its biology, the constraint/strategy debate may continue for some time. In this paper I shall refer to the word-learning Assumptions as both constraints and strategies, as both terms are descriptive.

3. Mutual Exclusivity in Bilingual Acquisition

This section will discuss the possible effects of bilingualism on the use of ME. Bilingualism brings up additional questions about ME. As mentioned above, children learning two languages probably meet roughly twice the number of ME violations that monolingual children do. There are two overarching questions then regarding bilingual children and ME. First of all, does ME operate across the two languages (i.e., does ME hinder children from learning translation equivalents (TEs))? Secondly, are bilingual children more able to suspend ME within a language than monolingual children are (i.e., does bilingualism hinder the operation of ME within a single language)?

Merriman and Kutlesic (1993) designed an experiment to examine both questions simultaneously. They tested 36 Serbian-English bilingual children and 42 English monolinguals, age 5-8. The children were introduced to several new objects in English. Later, the children were introduced to a doll who spoke in either French or English, and the children were told that the doll wanted to teach them a new word (a second name for one of the objects). If the doll had spoken in French, the children were told that the new word was French. This gave researchers the chance to see if bilingual and monolingual children extended ME across languages to

differeing degrees. The children were then rated on their correction effect and their restriction effect. There was no significant difference between bilinguals and monolinguals in their manifestation of a either ME effect when both the name teaching and the doll were in the same language. That is, both monolinguals and bilinguals tended to honor ME within a single language. However, when the second condition was in French, fewer bilinguals than monolinguals showed either effect. Only 32% of bilinguals corrected (i.e., called the novel object by the French name only), whereas 63% of monolinguals corrected. Similarly, more monolinguals than bilinguals showed the restriction effect in the "different language" condition.

These results show that bilinguals do retain ME within each language. Since both groups were equally likely to show a correction effect within the same-language condition, the authors conclude that bilingual children develop a reliance on ME to the same extent that monolingual children do. However, the results of the different language condition show that bilingual and monolingual children do extend ME differently. Perhaps because of their experience with TEs in two languages, bilinguals appear to be more willing to reject ME cross-linguistically. This would certainly be the "skilled response" (p. 246) since a bilingual child would be ill-served by such a hypothesis between languages.

Davidson, Jergovic, Imami and Theodos (1997) also examined the extent to which ME is preserved within a language. Subjects were preschoolers (3-4) and early grade-schoolers (5-6) who were monolingual English speakers or bilingual English-Urdu or English-Greek speakers. The authors showed the children small toys and household objects (e.g., soap dish, garlic press) most of which were known to the children, a few of which were not. They then taught the children nonsense names for a subset of the objects and looked specifically at the children's manifestation of the disambiguation and rejection effect. Mutual Exclusivity was significantly more evident in monolingual than bilingual children with respect to both disambiguation and rejection, although bilingual children still honored ME at a level above chance. These results show that while bilingual children's word learning is constrained by ME, their bilingual experience affects the extent to which this is so. Bilingualism seems to increase children's metalinguistic awareness about the relative utility of ME to the point that they do not rely on ME as heavily as monolingual children do.

Au and Glusman's (1990) second set of 3 experiments also tests the use of ME across languages. The authors tested both bilingual and monolingual children and adults, to see whether they would honor or override ME when they were told explicitly that the two novel names came from different languages. Results showed that both bilingual and monolingual children and adults suspended ME when they were aware that the second label was from a second language. This suggests that even three-year-olds are aware that different languages have different names for objects even when they don't speak another language themselves.

If children's bilingual word learning is constrained by ME, one might expect that children avoid learning translation equivalents (TEs) in English for words already known in their L1. Similarly, they might avoid learning words in L1 for English words they learn in L2[4]. On the other hand, if ME is not part of children's word learning strategy, we might expect TEs to proliferate, and we would expect there to be a significantly higher proportion of TEs in their vocabulary than singlets.

There are a few studies which specifically examine the extent to which ME is honored across languages, what I will refer to as "cross-linguistic M," in their earliest vocabulary (under 500 words). These are all observational studies rather than experimental studies. One of the earliest is Volterra and Taeschner (1978) who claim that children reject TEs in the earliest stages of vocabulary acquisition. They looked at the lexical development of three children being raised bilingual, and suggested that the children initially had a "single linguistic system" which did not allow cross-linguistic synonyms.

Pearson, Fernandez and Oller (1995) also studied cross-linguistic ME with the specific intent of discovering whether or not children do avoid TEs. These authors conducted longitudinal observations at 2-4 month intervals of 27 Spanish-English bilingual children. The results showed wide variation in the number of TEs in a child's vocabulary, as well as variation

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[4] Some might be confused by my use of the shorthand L1 (first language) and L2 (second language) for children I am otherwise referring to as "bilingual." De Houwer (1995) remarks on the difference between BFLA (Bilingual First Language Acquisition), where a child is introduced to both languages at birth, and BSLA (Bilingual Second Language Acquisition), where a child's introduction to another language takes place between the ages of one month and two years. Because of the young age that even BSLA learners begin to acquire the L2, eventual bilingualism is virtually assured. I therefore use the term "bilingual" together with the L1/L2 shorthand without implying any contradiction.

in whether children increased or decreased the percentage of TEs in their vocabulary. Their data provide no support for the position that simultaneous bilingual children avoid or reject TEs.

Given this, they find little evidence in favor of Volterra and Taeschner's (1978) strongest claim, that children initially have a single linguistic system. However, they admit that their data cannot unambiguously discount such a possibility. The fact that children do not avoid TEs suggest that either 1) Mutual Exclusivity operates only within a given linguistic system and not across languages, suggesting the children have two separate linguistic systems, or 2) that the children have a single linguistic system but Mutual Exclusivity does not operate. The authors do not reject this possibility, but do not appear to entertain such an idea very seriously.

4.0 Study Design and Subjects

This section explains the goals and design of the study, procedures, and the composition of the subject pool.

4.1 Experimental Goals and Design.

This study addresses the question of whether bilingual children, learning their two languages from different caretakers in different settings, employ ME across languages as one of their word learning strategies for their non-dominant language. We assessed the English vocabulary acquisition of three children between the ages of 2 and 3. Two of the children spoke Mandarin and one spoke Spanish. All of the children spoke their non-English language at home (L1) and English in daycare. The mothers of all the children were bilingual but stated that neither parent ever spoke to the child in a language other than the home language, and that all communication between the parents at home was in the home language. All three children were in daycare at least 3/4 time and all were in separate daycares. We observed each child's vocabulary growth in both languages once at the beginning of the study and a second time two months later, at the end of the study.

English vocabulary was assessed by the author, daycare workers, and the parents on the MacArthur Communicative Development Inventory: Toddlers (CDI). L1 vocabulary was

assessed at the same times by the parents using the available translations of the CDI.[5] Parents are asked to check off those words that their child produces independently (i.e., not as repetitions of adult speech). The reasoning for including three adults' assessments of the children's English was as follows. Dale (p.c.) has stated that parents are able to give the fullest account of their own child's linguistic development. Daycare workers, spending less time with them and having attention more divided by other children in their care, are unlikely to be able to give a full assessment of vocabulary. However, since parents might not have occasion to hear their child's full range of English vocabulary, it was decided to use both daycare workers' and parents' assessments of English in tandem. Comparison of the parents' and caretakers' forms showed substantial but not complete overlap, indicating that this had been the correct course of action. In addition, the forms filled out by the daycare workers were initially begun by the author after three hours of observation in the classroom. This was done to demonstrate a time commitment to the project and to the child, and hopefully, to interest the daycare workers in the project itself, facilitating completion of the form.

For expediency, the English CDI used with the Chinese children was not the standard MacArthur CDI but the translation of the Chinese CDI provided to this researcher by its author. This enabled us to incorporate nearly 25% more possible TEs into the study for the Chinese children than for the Spanish child. It also eliminated the need for hiring a translator and made it easier for parents of the Chinese children to complete the English version. Finally, it facilitated the cross-referencing of TEs in the two languages, which was a time consuming task between the Spanish and English CDIs.

This study is similar to that of Pearson, Fernandez and Oller (1995) in that it examines the vocabularies of bilingual children for evidence of TEs. However, Pearson, Fernandez and Oller consider only total vocabulary at each observation. In this study we focus on English vocabulary development between observations, to see if we observe evidence of a reliance on cross-linguistic ME in the English vocabulary acquired over a specific period.

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[5] Only the English and Spanish version of the CDI have been normed and tested sufficiently to be published. Working versions of the CDI are available in several languages, although many of these are little more than translations of the English version at this point.

4.2 Use of the CDI

The CDI comprises two parts. Section One lists 680 common early vocabulary words from the following categories: Sound effects (e.g, vroom, miaow), animals, vehicles, toys, food and drink, clothing, body parts, small household items, furniture and rooms, outside things, places to go, people, games and routines (e.g., peekaboo, snack), action word (i.e., verbs) descriptive words (i.e., adjectives) words about time, pronouns, question words, prepositions and locations, quantifiers and articles, helping verbs, and connecting words.[6] The CDI was used for this experiment as a means of assessing all three children on an equal level. It is impractical to ask parents to "write down every L1 word" their child uses. Such diary style reports, while valuable, are subject to parental bias and faulty memory. The word lists that make up the CDI allow caretakers to recognize rather than recall the relevant vocabulary, facilitating completion of the study. In addition, the CDI has been shown to "correlate positively and significantly with laboratory observations of vocabulary" (Bates et al, (1994)). The CDI is not designed to report every word a child knows, but to report a standardized sample of vocabulary. The items on the CDI werecarefully selected and normed over a period of years so that careful completion of it will reliably indicate the level of language the child has acquired.

The CDI does have its limitations. It cannot be used to assess the child's phonology for any of the words listed. The directions explicitly state that mispronunciations of words ("pisketti" for *spaghetti*) should be counted as instances of the actual word. Nor does it assess frequency of word use. A word used only once is marked and counted in the same way as a word used often. In addition, the CDI does not distinguish between a child's production and a child's use of a word. A word used incorrectly (e.g., overextended or underextended) is still counted as production of the word. Thus there is no way to assess a child's semantic understanding using the CDI. Finally, there is no doubt that many young children know and use words which are not included on the CDI, and parents may feel frustrated if they are unable to report their child's vocabulary as fully as they might wish. Regardless of these limitations, it remains a very useful

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[6] Section Two of the CDI regards children's grammatical development. Parents are asked to report what types of word combinations and types of inflection their child uses as well as the grammatical complexity of their utterances. This section of the CDI was not utilized for this study and will not be discussed further.

tool for looking at both a child's total vocabulary and at the patterns of vocabulary growth over time.

In this study we were interested specifically in the children's acquisition of Translation Equivalents. It was therefore important to restrict the words we examined to only words which appeared on BOTH versions of the CDI used for any given child. For example, the word *arana* appears on the Spanish CDI, but the corresponding English word *spider* does not appear on the English CDI. We would have had no way of knowing whether or not the child had actually learned the word *spider* because there was no means for it to be reported. Therefore the word *arana* was not included in the assessment of TEs. In addition, L1 words which could not unambiguously be assigned an English translation (e.g., Chinese *wo* corresponds to both *I* and *me* in English; Chinese *ge-ge* and *di-di* both correspond to *brother* in English) were eliminated from the study. Also eliminated were words for which grammatical gender warranted two separate entries on the Spanish CDI but not on the English (e.g., Spanish *aquel* and *aquella* for English *that*). For this reason, most deictics, pronouns, and prepositions were not included. Precedent for these exclusions can be found in Pearson, Fernandez and Oller (1993). Finally, words included on the Chinese CDI and its translation which did not appear on the MacArthur CDI were discarded. Many of these lacked a true "English translation," (e.g., green-onion pancake, deep fried flour stick). No modifications were made to the CDIs themselves, so the parents and daycare staff completed all of Section One at each observation and exclusions were made at the time of analysis.

4.3 Observational vs. Experimental Studies

An observational design was chosen for this study rather than an experimental one for two reasons. The primary reason was that the author is not fluent in either Spanish or Mandarin, and would therefore have been unable to conduct an experiment in the child's dominant language. Given the children's ages it seemed unwise to attempt an experiment in which the researcher would have recourse to only one of the children's languages, (presumably the non-dominant). A second by equally important reason was to take advantage of the CDI and of the new translations of the CDI that had been made available to the author.

The choice of an observational design also allowed us to avoid several confounds. One is that what children do in laboratory settings may not reflect accurately what they do in everyday situations. Davidson, Jergovic, Imami and Theodos (1997) point out that training procedures may actually teach children to restrict, reject or disambiguate in the particular conditions set by the experiment. "Of interest in this research was the extent to which children would restrict on their own, in part because children are assumed to be restricting without the aid of formal training in their everyday learning of language." (Davidson, Jergovic, Imami and Theodos (1997):20)

Another possible problem with experiments is that in a teaching situation such as those described above, the child may not be employing any particular *learning* strategy so much as trying to figure out what the experimenter wanted them to say. This possibility is noted in the above studies. Au and Glusman (1990) state that the children in their studies might have taken "the second experimenter's question as a test of whether the child remembered the first novel name. For instance the child might think, 'she wants to see if I remember *mido*. She's testing me to see if I mis-remember it as a *theri*. If I did, I would pick the midos. But I do remember what midos are so I won't pick the midos!'" (Au and Glusman (1990):1484). Davidson, Jergovic, Imami and Theodos (1997) found that when asked to name objects children often couched their answers in terms of "you said it was a knife" rather than simply calling the object a knife. "When further prompted, 'Do you think it is a knife (bird)?' most of the youngest children just shrugged their shoulders and/or did not verbally respond." (Davidson, Jergovic, Imami and Theodos (1997), p. 19) Older children also sometimes gave hybrid answers for the hybrid objects (e.g., "I think it's a knife-fork"). These types of responses suggest that children had no trouble remembering the label the researchers offered but give little indication of what the children would do outside this artificial situation.

5.0 Classifications for Analysis

This section details the two ways in which data was sub-divided for analysis.

5.1 Mean Month of Acquisition

One of the predictable patterns of vocabulary acquisition is that certain words tend to be learned earlier whereas other words tend to be learned later. A possible confound in this study is that children might be learning certain English vocabulary not because they do or do not know the corresponding L1 word, but simply because these English words are easier than others. Therefore, vocabulary was divided into 5 categories of relative difficulty using "mean month of acquisition" (MMA) as assessed by Fenson, et al (1994). Stratification of the words in this way made it possible to compare words of similar difficulty rather than comparing the acquisition of easier words with more difficult words. The categories were divided as follows:

		Total Words Assessed	
Category	Mean Month of Acquisition	(Sp - Ch)	Examples
A	under 20.4 months	95 - 107	*ball, outside, all gone, more*
B	20.4 - 22.29 months	92 - 95	*sun, ice cream, fall, walk, I*
C	22.3 - 24.59 months	87 - 97	*butterfly, happy, push, here*
D	24.6 - 26.79 months	94 - 112	*game, squirrel, give, where*
E	over 26.8	81 - 110	*penguin, black, sad, today*

Division points between categories are largely arbitrary, but were chosen to distribute assessed words as evenly as possible between the categories, as well as to keep categories limited to roughly equal age intervals. The few words which had not been assessed an MMA in norming tests were attributed to "month 31." This means that words whose MMA is unknown were given a high number (31) to signify that the word is not a common early-acquired word. This was another important reason for discarding the Chinese words that did not appear on the published MacArthur CDI; retaining them would have added a disproportionately large number of "31" words since their MMAs are all unknown. Until norming tests have been carried out on the Chinese CDI with monolingual Chinese children and MMAs for all the words on the Chinese CDI have been assessed, we have no principled reason for assuming that these should be considered early acquired words.

The mean month of acquisition is based on monolingual data (Fenson et al (1994)), and bilingual children typically acquire vocabulary later and more slowly (Umbel, Pearson, Fernandez and Oller (1992)). A group of bilingual children might be expected to have very

different MMAs for the words assessed in this study. It is therefore important to remember that, for the purposes of this study, the numbers themselves have no meaning except as an index of difficulty *relative to other words*. The fact that the word *juice* is assigned to "month 15" does not mean that it is always, or even usually acquired by the 15th month, but only that it is usually acquired before the word *water*, which is assigned to "month 18." Furthermore, MMAs apply only to the English vocabulary, not to the Spanish or Chinese. While monolingual English children typically acquire *juice* before *water*, it is not necessarily true that monolingual Spanish children typically acquire the corresponding *jugo* before *agua*. Norming of MMA with monolingual Spanish speakers is in progress for the words on the Spanish CDI but it has not yet been completed, and no similar norming study has been undertaken for Chinese as of yet. This is largely immaterial for the present study as we are not looking at why children learn particular L1 words, only why they learn particular English words. However, it is worth noting that all three children follow a very similar pattern in their L1 acquisition – that is, they have more category A words in their L1 vocabulary, followed by category B words, and so on. Therefore I think we can be relatively sure that in all cases the CDIs and MMA reasonably reflect normal patterns of word learning for all three languages.

5.2. Word Classes

Another predictable pattern of vocabulary acquisition is that children tend to show preferences for certain word classes. As mentioned above, it is most common for monolingual English children to have a noun bias in their earliest vocabulary (i.e., the first 100 words; although some children have a preponderance of social expressions, such as *hello* and *thank you* at first) with verbs and adjectives very sparsely represented. Caselli et al (1995) echo this finding of a clear noun bias for Italian, despite the fact that in Italian "verbs are particularly salient and informative" (Caselli et al (1995):192). Function words remain a very small percentage of total vocabulary until quite late (Bates, Dale and Thal (1995), Caselli et al (1995)). The reasons for these difference are largely unknown. It may be that nouns are repeated with greater frequency in parental input than predicates, or that prosodic indicators of word class are at play. It is also

possible that the more ephemeral nature of predicates is more difficult for children to grasp in their earliest stages[7].

All of the children in the present study were well past the 100-word mark, but the fact that word classes differ so reliably in early vocabulary suggests strongly that word class is an important factor in acquisition which should be addressed. Therefore, vocabulary was also assessed by word classes, specifically nouns and predicates (the majority of function words had already been dropped from analysis since in most cases they could not be unambiguously translated). We wanted to see whether children followed particular strategies with particular types of words. For example, it might be that children follow an ME strategy with respect to predicates while being more comfortable suspending ME in the domain of nouns (i.e., acquiring TEs), or vice versa. The division between nouns and predicates was meant to test such a hypothesis. The class of predicates was composed of verbs and adjectives. The noun class included common nouns only; people were excluded from this class as it was impossible to determine which of these words the children might know primarily as proper names. Also excluded was the "places to go" category, as many of the items in this category are used more as adverbials than as nouns in adult language. Again, the boundaries between MMA categories are largely arbitrary, but were an attempt to create categories with roughly equal numbers of words in each. Nouns and predicates were each divided into three categories:

	Nouns	**Total Words Assessed**	
Category	MMA	Spanish	Chinese
A_n	under 20.7 months	69	73
B_n	20.8 – 22.89 months	73	69
C_n	over 22.9 months	69	78

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[7] O'Grady (1987) believes that nouns are "primary" because they exist independently, whereas predicates are "secondary" because they predicate an action or state of a primary. Therefore, without sufficient

Predicates		Total Words Assessed	
Category	MMA	Spanish	Chinese
A$_p$	under 22.6 months	37	45
B$_p$	22.7 - 25.79 months	40	57
C$_p$	over 25.8 months	36	40

6. Analysis

This section will explain the statistical method used to analyze the data.

Results for each child were summarized in Microsoft Excel and statistically evaluated using Chi Squared (also in Excel). The following hypothetical examples will make explanation clearer.

English: L1:	NO	YES
NO	A 50	C 10
YES	B 50	D 40

Figure 1. Hypothetical data from "Sid"

Figure 1 represents a hypothetical set of 150 assessed words in a particular category. Knowledge of L1 vocabulary is represented vertically, knowledge of English vocabulary is represented horizontally.

- Box A represents words the child does not know in either language.
- Box B represents words the child knows in his L1 only, not in English.
- Box C represents words the child knows only in English (English singlets).
- Box D represents words known both in the L1 and in English (TEs)

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knowledge of nouns, the child has nothing to predicate action or state words of.

Adding Boxes B+D gives us the total L1 vocabulary (all words known in L1, both those which are L1 singlets and those for which the English TE is known). Now remember that our interest is the percentage of these known L1 words for which the child knew the corresponding English TE. Dividing D by B+D yields the percentage of known L1 words for which an English TE is known. Our other interest is the percentage of *unknown* L1 words for which the child nevertheless has a corresponding English form. Adding Boxes A+C gives us the total number of assessed words which are unknown in L1. Dividing Box C by the total of unknown words (A+C) yields the percentage of unknown L1 words for which the child does know an English form. Finally we compare these two percentages to see which is higher, and analyze that difference for statistical significance.

Let us use this formula to look at this hypothetical child's vocabulary (we'll call him Sid). Of the 150 words assessed in this category, Sid knows 90 L1 words (B+D). For 40 of those 90 words, Sid also knows the English equivalent (D). This means that Sid has English TEs for 44% of his L1 vocabulary in this category. Of the 150 words assessed in this category, there are 60 that he does not know in his L1 (A+C). Of those 60, he knows the corresponding English for 10 of them. This means that of the assessed L1 vocabulary he doesn't know, he has learned 17% of the L2 vocabulary. Comparing 44% TEs with 17% singlets, we can see that Sid might be following a pattern of actively suspending ME and searching for TEs, since they make up such a high percentage of his English vocabulary.

However, percentages can be misleading. The raw numbers must be submitted to statistical analysis to make sure that the observed difference is truly significant. Therefore a χ^2 test was performed. This test compares the actual numbers (the results of the study) with a set of expected numbers based on the null hypothesis that there is no relation between presence of the word in L1 vocabulary and presence in English vocabulary. The test calculates the probability that the results could be obtained by chance. In this study we conform to the standard convention that only $p \leq 0.05$ counts as significant; however, we consider probability levels of roughly $p=0.1$ which follow a pattern of significance to be worthy of note. A χ^2 run on this set of data shows that it is significant at the .0004 level that Sid learns TEs more than singlets. Thus we conclude that "Sid" does not follow a cross-linguistic ME hypothesis in his English Acquisition.

Imagine another hypothetical child (we'll call her Nan) whose vocabulary for the same category of 150 words is shown in Figure 2.

English: L1:	NO	YES
NO	A 40	C 30
YES	B 60	D 20

Figure 2. Hypothetical data from "Nan."

Nan knows 80 L1 words. Of those 80 words, she knows 20 English TEs. That is, TEs represent 25% of her total L1 knowledge. Of the assessed words, there are 70 that she doesn't know in her L1, and yet of those 70 she knows 30 English equivalents. (i.e., 30 English singlets). This means she knows the English for 43% of the assessed words that she doesn't know in L1. Comparing 25% TEs with 43% singlets suggest that Nan might be following a pattern of adherence to ME. Nan's results are significant at the .02 level.

7.0 Results for Individual Subjects

Four children were initially selected for the study: one Spanish-speaking boy (age 2;11-3;1) named Mariano, a Mandarin-speaking girl (2;6-2;8) named Yee and a boy (1;11-2;1) named Irving, and a Dutch-speaking boy (age 2;6) named Gebbe. Gebbe however had such an advanced Dutch vocabulary that nearly every English word he learned was a TE of a known Dutch word. His results have therefore been dropped from the study. A total of 449 words were assessed for Spanish, 521 for Chinese.

7.1 Mariano

At his first assessment (T1), Mariano had a total Spanish vocabulary of 135 and an

English vocabulary of 44 based on the words assessed in this study. (He had a total of 151

Spanish and 64 English based on the complete CDI). Of those, 29 were TEs. This known

vocabulary did not show evidence of ME in categories A-D. In each category, his proportion of

TEs to known Spanish vocabulary was more than double his proportion of English singlets (i.e.,

English words for which he does not know the Spanish equivalent) to unknown Spanish words.

Mariano knew too few category E words for statistical assessment (only 3 in Spanish and none in

English). His singlets were generally between 5-6% (although reaching 11% in category A),

while his TEs on the other hand, ranged from 17% in category B to 30% in category D. The

results of a $\chi2$ test showed that only in category D was this trend significant (p=0.001); in

categories A, B and C this trend failed to reach significance (A: p=0.172; B: p=0.122;

C:p=0.072). The overall pattern, however, was strong enough to support the suggestion that

Mariano seemed comfortable with English TEs for his Spanish vocabulary; at the very least he

certainly did not avoid them. His second observation (T2) bears this out. Mariano's total

vocabulary at T2 has significantly more TEs than singlets in categories A-D (A:p=0.003;

B:p=0.006; C:p=0.008; D:p=0.03). Thus Mariano does not appear to be guided in his vocabulary

acquisition by any cross-linguistic ME.

One goal of this study however, is to look not only at the pattern reflected in total

vocabulary knowledge, but to look especially at the pattern of acquisition for a limited

developmental period. This allows us to more clearly focus on the process by which a child

acquires vocabulary. We therefore examined the English words learned *subsequent* to the first

observation to note whether or not Mariano's actual English learning during that two-month

period reflects the pattern toward TEs as well. It is clear that it does. This time only the words

which had been unknown in English at T1 were submitted to analysis. Again, in categories A-D,

the proportion of TEs Mariano knew ranged from 24% to 78%, while the proportion of singlets

ranged from 5% to 22%. This difference was significant in all categories (A:p=0.017;

B:p=0.027; C:p=0.031) except in category D, where, despite a strong indication of continuing to

follow this trend, the results were not significant). These results clearly indicate that Mariano's

overall acquisition of English vocabulary in this period is not guided by cross-linguistic ME, but that he welcomes TEs and may even seek them out.

Within the word classes of nouns and predicates, Mariano's preference for TEs is equally pronounced. At T1 he had 12 TEs among the easiest nouns, and 3 in each of the other two noun categories. This trend toward TEs reached significance in categories A_n (p=0.060), and C_n (p=0.009). The same pattern was evident, although not significant, in category B_n (p=0.15). The trend continued at T2. Between the two observations, Mariano learned 33 TEs in A_n (79%), 15 in B_n (45%), and 1 in C_n (8%). Both A_n (p=0.04) and B_n (p=0.004) were significant, with the trend slightly evident but not significant in category C_n.

Mariano's predicate acquisition follows a similar pattern. At T1, Mariano knew only a few predicates – only 21 in Spanish and 11 in English (of the assessed data). He knew 3 predicate TEs in each A_p and B_p, 25% and 38% of his total Spanish predicate vocabulary respectively. B_p is significant at 0.003. Mariano never acquired any TEs in category C_p. His growth in English predicates is very similar to his growth in English nouns. Between T1 and T2 Mariano learned 10 (58%) new TEs in category A_p, and 5 (38%) new TEs in category B_p. Neither of these proportions reach statistical significance, however.

Above we noted that in Mariano's overall vocabulary, acquisition of singlets during this period was very uniform across categories while his TEs were highest in the easy categories and lowest in the most difficult. This pattern is also found in nouns and predicates. First consider nouns. At T1, no particular pattern is seen; his highest percentage of TEs was in the most difficult category (30%) followed by the easiest category (24%) and finally the medium category (13%). However, the growth in TEs during the period observed was much greater with the easiest category. 79% of his new category English A_n vocabulary was TEs, followed by 45% of his English B_n vocabulary and 8% of his English C_n vocabulary. Again, the absolute numbers are revealing. Mariano acquired 33 TEs to 1 singlet in category A_n, 15 TEs to 5 singlets in category B_n. Interestingly, he acquired 4 singlets to only 1 TE in category C_n. Again, Mariano's acquisition is inconsistent with ME in easier words, while it is quite consistent with ME in the more difficult words.

With respect to predicates, the trend observed above is evident here as well. At T1, Mariano had 38% in category B_p, and 25% in A_p (he never acquired any TEs in C_p). His TE

growth in predicates however is far greater in A_p (50%) compared to 38% in B_p. And yet, as in all the other cases, his singlet vocabulary is remarkably constant – 3 in A_p, 4 in both B_p and C_p. Note that again, similar to C_n, Mariano acquired 4 singlets in the most difficult category of predicates but did not acquire a single TE in this category. Again, it seems that Mariano is happy to suspend ME in the easier categories but falls back on ME in the more difficult categories.

Overall, Mariano's word learning across his two languages appears to be constrained by ME only with the most difficult words. Indeed, a large proportion of his English vocabulary consists of TEs. It is important to note that this is not simply because Mariano has such a large Spanish vocabulary that he has little English to learn that would not be TEs. In fact, despite Mariano's age his total Spanish vocabulary at T1 was 151, only about one quarter of the words on the Spanish CDI.

7.2 Yee

At her first observation, Yee knew a total of 171 Chinese words and 185 English words based on the assessed data, 93 of which were TEs. In all but category E, the proportion of TEs to known Chinese words was greater than the proportion of singlets to unknown Chinese words (Yee had no TEs in category E at this point). However, only in category A did this difference reach significance (p=.03). The other categories were far from significant. In categories B and D the difference in proportions was only 3-5%. Thus at T1, Yee's pattern of knowledge appears quite random. At the second observation, however, Yee's vocabulary had increased rather dramatically. Her total vocabulary was now 214 Chinese and 314 English, 174 of which were TEs. In all but category E, Yee now had a higher proportion of TEs than singlets (and in category E the difference in the proportions was only 2%). These proportions are statistically significant in categories B (p=0.009), C (p=0.003) and D (p=0.05). This suggests that Yee is readily incorporating TEs into her vocabulary although not to the same extent that Mariano is.

More importantly, this pattern is also clear in the subset of English vocabulary we are most interested in, that learned between the two observations. Looking only at this group of words, Yee's proportion of TEs was higher than her proportion of singlets in categories B, C, and D (and in A the difference between the two is only about 1%). However, only in categories B and C is this significant (p=0.05, p=0.01 respectively); in D it is suggestive only (p=0.088). In

category E, Yee learned only 1 TE to 17 singlets. This suggests that Yee does not employ ME in the categories with which she is most comfortable, but that the English words in category E are still somewhat beyond her level at this time.

The word class analysis does not shed much light on Yee's particular pattern of acquisition. In the noun word class, Yee shows a very mixed pattern at her first observation. In category A_n the percentage of TEs to singlets is virtually identical (68.6% to 68.1%). In category B_n she has a higher percentage of singlets, whereas in C_n she has a higher percentage of TEs, but in none of these categories do the proportions reach significance. Her second observation offers little more insight. Again she appears to be acquiring proportionally more TEs than singlets in all three categories (although in category C_n in raw numbers she has acquired nearly 4 times as many singlets as TEs) but only category B_n approaches significance at the level of $p=0.07$. Thus her noun acquisition cannot readily be called anything but random. The predicate word class also shows a tendency toward proportionally more TEs but again no category reaches significance.

7.3 *Contrasting role of MMA for Mariano and Yee*

We have seen that Yee and Mariano both show a pattern of learning TEs. In examining the data more closely, an interesting difference between the two children emerged, to which I now turn. Recall again the nature of MMA. Category A words are easiest and tend to be learned earliest across a large population, Category E words are the most difficult and tend to be learned later. This does not meant that we expect children to learn *all* category A words before they learn any category B words. However, it does mean that we can make two predictions, all other things being equal. First, we can predict that at any given time (e.g., T1 or T2) the largest section of a child's vocabulary will be made up of A words, the second largest of B words and so on. Secondly, we also predict that in any given period of time (e.g., the two month period between T1 and T2) children are likely to learn more A words, then the next most B words, and so on (until, of course, they have learned all the A words).

That last prediction can be further subdivided into two predictions — one regarding TEs and one regarding singlets. Thus we might posit predictions 2a and 2b. Prediction 2a: A child will learn more singlets of category A, the next most of category B, and so on. Prediction 2b: A child will learn the most TEs of category A, the next most of category B, and so on.

When these predictions are not borne out, it is worth noting that they are not, in order to speculate why. Let us therefore examine Mariano and Yee's numbers again, scrutinizing more carefully the patterns found between the five MMA categories.

At T1, Mariano had relatively few English singlets, 3 in category A and 4 each in the other categories. Despite these relatively small numbers however, it is probably worth mentioning that the percentage of singlets decreased somewhat as the difficulty increased (11% in category A down to 4% in category D). The reason it is worth noting is because this is markedly *not* the case with his TEs. Mariano has 24% TEs in category A, but only 17% in B, moving up to 19% in C and a full 30% in category D.

Between the two observations, however, Mariano's actual learning of English appears to fit with our predictions much more neatly. In fact, TE percentages range from 78% in A stepwise down to 23% in D (remember that Mariano never did learn any TEs in category E), and singlet percentages range from 50% stepwise down to 13% in D (and 5% in E). In sum then, Mariano conforms to our prediction about MMA between the observations, although our snapshot of him at T1 does not.

Let us now examine Yee's data. At T1. Yee fits our prediction nicely. Her TE percentages range from 74% stepwise down to 22% in D (Yee did not have any TEs in category E at T1). Her singlet percentages likewise ranged from 54% in category A stepwise down to 19% in D (and 7% in E.) Here she is unlike Mariano in that she does fit the expected pattern for MMA at T1. At T2 her vocabulary is likewise very predictably distributed.

Yee's acquisition during the 2-month period between observations is quite different, however. Her percentage of TEs is remarkably consistent from categories A through D; they are: 65%, 65%, 66%, 60% (and 11% in category E). Her singlet acquisition is similar. In category A she learns 66% singlets, but then jumps to the mid-30s for categories B-D (37%, 34%, 38%) (and 17 % for category E).

What can account for these differences between Mariano's pattern and Yee's pattern of acquisition? One possible explanation of Mariano's erratic pattern of TEs at T1 is that, if we looked at any arbitrary 2 month period leading up to T1 we might find the expected pattern of acquisition, but, due to the numbers of words in various categories being learned at different times, the predictable acquisition pattern does not lead to a predictable snapshot of his

knowledge at this particular time. Significantly, at T2 Mariano does show the predicted pattern, lending credence to this explanation.

With regard to Yee's even distribution of both TEs and singlets during the observation period, it is possible that Yee is no longer overly influenced by the relative difficulty of words. Notice that she learned the most English words, 39, in category D, and her acquisition was somewhat more consistent in categories A, B and C (23, 24 and 28 respectively). It may be the Yee has attained a particular level of development when she is most attuned to the D level of words, having learned already a good number of the easier words and not yet being ready for many of the E words. This would explain why she finds words of all but the most difficult category to be of roughly equal difficulty with respect to TEs, singlets and English vocabulary in general.

7.4 *Irving*

Irving shows a completely different pattern of development than either Mariano or Yee. At T1, Irving's total Chinese vocabulary was 136, and his total English vocabulary was 159, of which 47 were TEs. Irving showed no tendency toward TEs at his first observation. He rather showed a preference for singlet vocabulary in all categories (except B, where the proportion of TEs was 4% higher than the proportion of singlets). This trend toward singlets was significant only in category A ($p=0.01$). In categories C, D and E the trend was evident, but not significant. Irving's total vocabulary at T2 continues this pattern. This time the preference for singlets is evident in all categories but is statistically significant only in categories C ($p=0.006$) and D ($p=0.052$).

However, when we examine the vocabulary learned between the two observations, no significant trend emerges. The tendency toward singlets, again apparent in categories A, C and D, is so minor as to be negligible (indeed, no category came close to significance). Category B shows a slight preference for TEs (one more TE than singlet learned, as well as a 5% higher proportion of TEs than singlets), and in category E the percentages are virtually identical (4.5% singlets to 4.1% TEs). In categories C and D Irving learned more singlets than TEs by a factor of 3, in category E he learned 11 singlets to 1 TE. The greatest number of singlets learned were in categories C and E (11 in each), with half to two-thirds that number in the other categories.

Despite the lack of statistical significance, Irving's tendency to learn singlets is noteworthy: of the 135 new Chinese words and 53 new English words he acquired between the two observations, only 19 of them were TEs. This means that TEs represent only 10% of his total vocabulary growth during the period of observation, as opposed to 28% for Mariano and 25% for Yee. Interestingly, the tendency toward singlets was evident not only in the proportions of known and unknown Chinese words, but also in the absolute numbers of words learned, in four of the five categories (as mentioned above, B is the divergent category). This is in marked contrast to both Yee and Mariano, who tended to learn a greater number of singlets than TEs in the more difficult words, while proportionally showing a preference TEs. For these reasons, the lack of statistical significance in Irving's data is disappointing, and make the results difficult to intperpret. It would be tempting to say that Irving's word-learning strategy incorporates ME across his two languages, but in order to confirm this, data from more observations would be needed. The most that can be said is that Irving certainly does not seem to embrace TEs as readily as Mariano and Yee do.

Evaluation of nouns and predicates are equally inconclusive. Again, in absolute numbers Irving learned more noun singlets than noun TEs (except in A_n, where he learned 4 of each). Proportionally though, he learned a larger proportion of TEs in both categories A_n and B_n. However no category approaches significance so it is difficult to draw any conclusions. Irving learned only 8 English predicates between T1 and T2: 4 TEs in category A_p, 1 TE and 1 singlet in each of the categories B_p and C_p. Therefore, we cannot suggest that Irving is following either a strategy of employing or rejecting ME with respect to any particular class of word. Despite the suggestion of a preference for singlets, his vocabulary acquisition must at this point be considered random.

8. Discussion

The findings of this study are, to some extent at least, very much in accord with the research discussed earlier. ME does not appear to hinder children growing up bilingual in the acquisition of TEs in their L2. Irving is the one exception to this, and as noted, in Irving's data there is no indication of significance. In addition, the proportion of TEs learned correlated highly with MMA category. Thus our hypothesis, that children learning two languages in two

different settings from different caregivers will learn proportionally more TEs than singlets, appears to have been on the right track.

It is not particularly surprising to find the pattern that Yee and Mariano exemplify. Children growing up bilingual will inevitably learn TEs, eventually. One drawback of this study is that we cannot be sure exactly *when* TEs are learned. We know only that the English had not been learned at T1, but the children may have known the L1 forms for several months or only a few days before learning the English form. The fact that TEs were learned does not prove that they were learned right away. This of course makes comparison with experimental studies difficult. In an experiment the researchers document a child's reaction to ME violations (reactions such as the correction effect and others mentioned above) on the spot. We do not know if the child did initially reject the English word or learned it immediately. Observational studies such as this one are at a comparative disadvantage in this respect.

Unfortunately, short of having children wear microphones during their every waking hour, it is impossible to track language development as closely as would be necessary to gather such information. Inevitably, at any observation taking place two months after the most recent one, much of the more minute detail regarding exact order of word acquisition will be lost. This is unfortunate, but I know of no remedy for this and have found nothing in the literature to suggest that other researchers have overcome this obstacle.

If we had only Yee's and Mariano's data to examine, we might be tempted to say that we have learned nothing new. We might consider it obvious that children will learn more TEs than singlets in easy categories of words, simply because they know more words. The reason that the children had so few TEs in category E may in fact be obvious; when children have so few words of this level in their vocabularies, and the words are at a higher level of difficulty than they are yet comfortable with, the chance of their acquiring TEs during this period is exponentially lower. However, despite the lack of significance in Irving's data, we cannot discount the fact that he most decidedly does not follow the expected pattern. This suggests that ME is being honored and/or suspended by at least some children in their word learning. Again, the lack of significance is all the more disappointing because it does not allow us to really interpret this trend or explore the possibility in more detail. Thus, as for every study, additional studies with

more children would be necessary to try and tease out the possible meaning of the different patterns the children show.

This brings us to one very clear conclusion of this study, which has been echoed elsewhere. Children do not all learn language exactly alike. We have seen that Mariano does not mind TEs, while Irving appears to avoid them (although remember that the data are inconclusive), and Yee falls somewhere in the middle. These children also differed with respect to how consistent their word learning was across MMAs, as well whether their raw numbers of TEs and singlets reflected the corresponding proportional trends. Variability across children is commonly noted in many aspects of their language acquisition. Some children begin speaking before they are a year old while others utter few words until they are past 2. Some children prefer nouns while others prefer social expressions. Some children shy away from difficult pronunciations while others are happy to tackle any word no matter how difficult its pronunciation. And these few just barely scratch the surface. This study shows that children can vary too in the extent to which they allow Mutual Exclusivity to guide their acquisition of a second language. It would not be at all surprising to find that monolingual children also vary in the extent to which they adhere to ME, nor would it be surprising if children also differ in the ways in which they employ the other word learning assumptions discussed above.

It would have been preferable, of course, to include in this study only children of the same L1 background. Due to the difficulty of finding subjects for whose language a CDI was available, it was impossible to include only children of the same home language. This leads to the very real possibility that acquisition differences between Spanish and Chinese may have been at least partially responsible for the results obtained here. For example, as noted above, Tardif (1996) shows that the noun bias which was thought to be virtually a universal pattern in child language acquisition does not hold true for Chinese. Chinese children tend to favor verbs in their early vocabulary to a much greater degree than English children do. Other research has shown that the observation that children go from a one-word to a two-word phase without adding grammatical morphology is at least to some extent an artifact of the syntactic nature of English. In languages like Turkish and Japanese, with rich morphological systems, many grammatical morphemes do begin to appear before children enter the two-word phase (Bates, Dale and Thal (1995)). The probability that other differences exist in the normal acquisition patterns of children

speaking different languages is undeniable, but as yet we do not know what many of them might be.

This is actually an extension of a more general problem, that of understanding the role of input in language acquisition. One suggestion Tardif (1996) makes for Chinese children's preference for verbs is the relatively high frequency of verbs and other predicates in everyday Chinese adult speech, predominantly due to the structure of Chinese syntax. Caselli et al (1995) on the other hand, note that the saliency of Italian verbs in adult speech dones not lead to an increase in the percentage of verbs in Italian children's speech. This study makes does not observe or record the caretaker speech which provides the context for the child's utterances, nor do any of the other similar studies mentioned above. However, only such observation will allow us to know what the contribution of adult speech to children's lexical development is.

Furthermore, it is at least theoretically possible that the syntactic and lexical similarities between English and Spanish aided Mariano in the acquisition of TEs while the utterly divergent nature of English and Chinese hindered Yee and Irving from acquiring such a high proportion. At this point, the likelihood of such a possibility is almost impossible to gauge. Not only is there too little research on bilingualism in general, but I am aware of no research at all specifically concerning the interaction of particular languages. It is therefore impossible to say whether the inclusion of children speaking different home languages prevented us from seeing a pattern that might have emerged more clearly given a more homogenous subject base.

Age is another possible confound in this study. Mariano, the oldest of the three subjects, was 5 months older than Yee and a full year older than Irving. While his total vocabulary was actually smaller than that of either of the other two children, it is nevertheless a fact that he has had an extra year of exposure to language in general. Most studies of ME have reported that reliance on ME increases with age, but it might be that for bilingual children, the longer exposure to ME violations may foster a willingness to suspend ME across languages. Both Au and Glusman (1990) and Merriman and Kutlesic (1995) note this finding in their experiments. This might then contribute to Mariano's high percentage of TEs.

An important question, and one which cannot be answered here, is what it really means for a bilingual child to "suspend ME" across languages. We do not know exactly how ME is employed in the first place, so it is difficult to know the manner in which it is suspended. It is

tempting to say that a child who does not appear to be employing ME as a word-learning strategy is "seeking TEs," but this might well be too strong. The fact that they accept TEs doesn't necessarily mean they are actively seeking them, just that they do not avoid them, which is not nearly as strong a claim.

In fact, it is possible that a child might acquire what appear to be TEs, while still adhering in their own mind to ME. Pearson, Fernandez and Oller report apparent TEs that are actually used for different semantic concepts (e.g., *barco* for sailboats but *boat* for all other boats). This is impossible to test in the present study, where the separate settings for each language make it difficult to know whether the child might use the opposite word for the same toy in the other setting (e.g., calling the same stuffed toy a *bear* at daycare and *osito* at home.) As mentioned earlier, the CDI does not offer parents the opportunity to make note of such instances, although they may well be aware of them.

9. Future Work

This study examined specifically the acquisition of TEs in the language being acquired secondarily. In looking at vocabulary change, we eliminated from analysis only words which had been unknown *in English* at the first observation. This methodology is (at least tacitly) based on the assumption that children will learn words first in their L1, and subsequently learn the L2 word as a TE. However, the fact that these children did acquire a substantial number of English singlets shows that children may also employ ME when "working backwards," so to speak. If we were to eliminate from analysis words which had been *unknown in the home language* at T1, we could then focus on how children learn L1 TEs for words they already know in their L2. Although the English MMA appears to have a high validity for both Spanish and Chinese, there are likely to be substantial differences as well. Thus such a study would be inappropriate at this time. However, when the norming studies for Spanish are complete, it would be very interesting to reanalyze Mariano's data to see if the same patterns emerge regarding his use of ME and his acquisition of TEs. This would also be interesting with the two Chinese children, especially since it is Irving's data which, on the face of it, offers the greatest possibility for divergent interpretation. However, as mentioned above, I know of no plan at this point to undertake a norming study of the Chinese CDI.

Pearson and Fernandez (1994) point out that the environment(s) in which a bilingual child learns her two language and the number of caretakers she hears use the languages are variables which might both impact how ME is manifested, specifically resistant a child is to acquiring TEs. They state that learning the two languages in different environments and learning the two languages from different monolingual adult caretakers might both contribute to a child's avoiding TEs (see Figure 3). Thus children learning one language at home with the parent(s) and a second at daycare or school with teachers and peers (i.e., Figure 3, Box D) should have the fewest TEs, while a child learning both languages from one or more bilingual caretakers at home (Box A) should have the most. Children learning both languages under a "one parent, one language" model (Box C) should fall somewhere in the middle. However, the authors admit they are "without a principled basis" (Pearson and Fernandez (1994):646) for this assumption.

One can certainly construct a rationale consistent with such a hypothesis. It might be that hearing different labels used interchangeably by a single caretaker models for the child the non-existence of cross-linguistic ME. A child might reasonably conclude that if both mommy and daddy use the words "mesa" and "table" to refer to the flat surface in the dining room, ME (either cross-linguistic or "within a single linguistic system," as suggested by Volterra and Taeschner (1978)) does not exist. Furthermore, children learning each language from separate caretakers in different settings have little need in one setting for the vocabulary learned in the other setting. Thus they may not encounter TEs as often as children hearing both languages in the same environment.

	Bilingual Caretakers	Monolingual Caretakers
Single Environment	**A** Bilingual caretaker(s) at home	**C** "one parent, one language"
More than One Environment	**B** Bilingual caretaker in different setting (e.g., L1 at home, L2 in public)	**D** Parents speak L1, teachers speak L2

Figure 3. Based on Pearson and Fernandez discussion (1994;645)

On the other hand, it is equally possible that "Box A" situations might rather allow children to reinforce their adherence to ME because children feel little need for TEs. By choosing just one name for any given referent they know their caretaker is sure to understand. In addition, it seems equally plausible that for common everyday objects (such as toys, furniture, etc.) children in a "Box D" situation might acquire TEs easily because they have more clearly separated the two linguistic systems and suspend cross-linguistic ME accordingly. In fact, it is theoretically possible that children may be influenced either way.

Indeed, an early goal of this study was to compare the parallel ("Box A") vs. integrated ("Box D") situations. Unfortunately, due to the difficulty of finding subjects of a suitable age for whom a CDI was available, this part of the study could not be attempted. Certainly this is an area ripe for additional research.

There are still many aspects of child language acquisition that we do not understand, and many of these might shed interesting light on children's use of ME. For example, we do not know to what extent ease or difficulty of pronunciation affects which words a child learns first. We know that children do tend to avoid words that they find difficult to pronounce. It might be that TEs are less likely to be acquired when one of the TEs has a more difficult pronunciation pattern (e.g., CV words like *rojo* might be learned before CVC words like *red*.) However, before such studies can be undertaken that would shed light on the process of cross-linguistic ME, more must be known about acquisition in general.

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Table of Contents