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CONTENTS

The Pluralisation of Nouns in New Zealand Sign Language

Sophia Jarlov Wallingford

Abstract

This paper provides a description of the ways in which the plurality of New Zealand Sign Language (NZSL) nouns is expressed. Through an investigation based on naturally occurring NZSL data in a corpus, it was found that nominal plurality can be expressed through:

- reduplication
- quantifiers
- numerals
- classifier constructions
- pronouns
- verbal agreement

Combinations of these strategies occur within utterances, and number agreement within the noun phrase is apparent when a noun can be marked for plurality through reduplication. Whether or not a noun is able to be reduplicated seems to depend on the phonological form of the particular noun. One case of suppletion (the plural noun PEOPLE) and the lexicalisation of the plural noun CHILDREN are also discussed.

1. Introduction

The ways in which the plurality of nouns is marked in New Zealand Sign Language (NZSL) has yet to be formally investigated. A grammar of NZSL, produced as a guide for learners of the language, makes no mention of how nominal plurals are formed (McKee and McKee 2007), nor does the Dictionary of NZSL (Kennedy 1997). The results of a preliminary investigation into the forms and functions of reduplication in NZSL showed that reduplication can sometimes be used to morphologically mark a noun for plurality, and reduplication of some verbs indicated their agreement with a plural object, expressing nominal plurality through syntax. Plurality is indeed marked in NZSL, through a combination of morphological and syntactic strategies. These strategies are explored in detail in this paper, in the hope of giving an overview of the ways in which nominal plurality can be expressed in NZSL.

1.1 Background to New Zealand Sign Language

NZSL is the visual gestural language used by the Deaf community of New Zealand. The shared vocabulary shows that NZSL is closely related to British Sign Language (BSL) and Australian Sign Language (Auslan) (McKee and Kennedy 2000; Johnston 2002).

Dugdale estimated that there are perhaps 4,300 people who identify as Deaf in New Zealand (2000:17). It is conventional to use the term Deaf with a capital 'D' to refer to cultural deafness, one of the central aspects of which is the use of NZSL. With a lowercase 'd', deaf refers to auditory deafness only.

The first in-depth linguistic analysis of NZSL was in 1989, with Collins-Ahlgren's PhD thesis at Victoria University of Wellington. Since then, research into NZSL has expanded, most notably with the publication of the Dictionary of NZSL (Kennedy 1997). The Deaf Studies Research Unit (DSRU) at Victoria University of Wellington is now the main centre for NZSL research, as well as producing occasional publications, such as a grammar guide for NZSL learners (McKee and McKee 2007). The corpus of naturally occurring discourse in NZSL that was used for the project reported here was developed at the DSRU.

1.2 Plural marking

Across languages, the expression of plurality may be achieved morphologically, or syntactically (through agreement). In addition, many languages employ quantifiers, such as the English *many*, and plurality may also be marked by the use of numerals within a sentence, or through syntactic means with specific lexical items which mark plurality. These strategies may co-occur (Corbett 2000).

Pizzuto and Corazza (1996) describe morphological plural marking on Italian Sign Language (LIS) nouns. They found that nouns articulated in neutral space (in front of the signer's chest) can be reduplicated to express plurality (Pizzuto and Corazza 1996:175). Nouns articulated on or close to the body (including those contacting a base hand in neutral space), however, could not be reduplicated. To express plurality for body anchored nouns, they must be combined with a lexical modifier such as MANY. They found that signs articulated in neutral space, but which involved inherent movement, also seemed to not be able to reduplicate. They also found that classifier constructions[1] were often used to express the plurality of nouns, and that often classifiers themselves were reduplicated to express the plurality of the entity they represented (Pizzuto and Corazza 1996:184-5).

Pfau and Steinbach (2006) conducted a study into the pluralisation of nouns in German Sign Language (DGS). They found that some nouns could be reduplicated to show plurality, and that there are two kinds of reduplication: 'simple reduplication', where the base was repeated in the same location, and 'sideways reduplication' where the base moved sideways as it was repeated. They note that the choice of plural marking was subject to phonological constraints which may be language specific (Pfau and Steinbach 2006:159). They also found that reduplication

[1] In signed languages, a signer is able to indicate an entity, and describe what it looks like, how it moves, its location et cetera through the use of 'classifiers'. An utterance containing classifiers is referred to as a 'classifier construction'. Recently, the terminology has changed, and what were previously referred to as classifier constructions are now referred to as 'poly-morphemic' structures (eg Schembri 2003). The better-known term 'classifier construction' will be used in this paper. These are discussed in more detail in section 3.4.

of a noun was blocked when it occurred in the noun phrase (NP) with a quantifier or a numeral (Pfau and Steinbach 2006:164).

There is a class of verbs which agree with their subject and object through their path of movement in NZSL (McKee and McKee 2007), and in other signed languages such as Auslan (Johnston and Schembri 2007) and ASL (eg Valli and Lucas 1992; Wilbur 1987). For example, the verb GIVE in NZSL can move from the first person location near the signer's chest, to a location further out in the signing space to mean *I give him/her*. Of particular interest for this investigation is that the plurality of a grammatical object may be incorporated into the verbal inflection. This is achieved by reduplicating the movement in an arc, meaning *I give (each of) them*, or a sweeping arc meaning *I give them (all)* (McKee and McKee 2007: ch 4). Through the morphology of verbal agreement, information about the plurality of an object can be expressed.

2. Methodology

The investigation presented here is based on naturally occurring NZSL discourse, from a video recorded corpus developed at the DSRU at Victoria University of Wellington. The Deaf participants in the corpus are adult males and females, who vary in age. The data has been glossed, and some translated, by Deaf research assistants.

From the data, nouns which refer to plural entities in the real world were identified, and examples of the sentence contexts in which they occurred were recorded. These examples were then sorted according to how the plurality of the noun was indicated. The results are presented below in section 3.

3. Results

Plurality was found to be expressed in a variety of ways in NZSL. Reduplication was used to morphologically mark plurality of certain nouns. Due to phonological constraints, however, the majority of nouns referring to plural entities were unable to take morphological plural marking (reduplication). The understanding that the noun referred to plural entities came from other information in the sentence. This included the use of quantifiers (section 3.2), numerals (section 3.3), and classifier constructions (section 3.4). Additionally, plural pronouns (section 3.5) were also often used to express the fact that an entity, in particular an animate or human one, was plural. Finally, some verbs can be inflected to agree with a plural object, thereby compelling the nominal object to be interpreted as plural (section 3.6). One case of suppletion (the plural noun PEOPLE) was found, and is discussed in section 3.7. Additionally, the possibility of the lexicalization of a plural deriving from a reduplicated singular form occurs in the example of the noun CHILDREN and is considered in section 3.8. Each of these pluralisation strategies will be discussed below, along with examples of their use.

3.1 Reduplication

Reduplication is described by Rubino as 'the systematic repetition of phonological material within a word for semantic or grammatical purposes' (2005:11). Some NZSL nouns can be reduplicated to express plurality. Pfau and Steinbach (2006) investigated reduplication in DGS nouns, and found that phonological factors were important in determining whether a noun was able to be reduplicated, and what form that reduplication took. A modified version of Pfau and Steinbach's (2006) schema, showing phonological variables and their effect on the reduplication of NZSL nouns, is shown below in table (1).

Table (1) Phonological variables and their effects on reduplication

<table>
<tr><td colspan="2">Body anchored</td><td colspan="2">No reduplication</td></tr>
<tr><td colspan="2">Non-body anchored</td><td colspan="2"></td></tr>
<tr><td rowspan="4"></td><td>Complex movement</td><td colspan="2">No reduplication</td></tr>
<tr><td colspan="3">Simple movement</td></tr>
<tr><td rowspan="2"></td><td>Centrally articulated</td><td>Possible simple reduplication</td></tr>
<tr><td>Laterally articulated</td><td>Sideways reduplication</td></tr>
</table>

As can be seen in table (1), there are two kind of reduplication in NZSL. Pfau and Steinbach use the term 'simple reduplication' (2006:143) which is when the base noun is simply repeated without any spatial displacement. 'Sideways reduplication' (Pfau and Steinbach 2006:143) refers to the sideways displacement of the base with each reduplicant. Both of these can be observed in NZSL, and will be discussed below with reference to the phonological variables.

3.1.1 Body anchored nouns

Body anchored nouns have some point of contact with the body or head during articulation.

WOMAN and DEAF (as a noun meaning 'Deaf person') are both body anchored nouns in NZSL. WOMAN (figure (1a)) contacts the chest, and DEAF (figure (1b)) is signed with contact to the ear.[2]

[2] Images are sourced from Kennedy 1997. Refer to the prototype online version at <http://homepages.mcs.vuw.ac.nz/~pondy/nzsl/home-vocab.html>. Some modification of images has been made.

Figure (1) Body anchored nouns

(a) WOMAN (b) DEAF

WOMAN and DEAF were never found in a reduplicated form when referring to plural 'women' or 'Deaf people'. The ungrammaticality of reduplicating these nouns is thus illustrated with examples (1) and (2).[3]

1) WOMAN
*WOMAN++
*WOMAN>>
'women'

2) DEAF
*DEAF++
*DEAF>>
'Deaf people'

It is thus possible to conclude that body anchored nouns in NZSL are unable to be marked for plurality through the morphological process of reduplication.

3.1.2 Non body anchored nouns

Non-body anchored nouns do not contact the body or face during articulation (though the hands may contact each other). Non-body anchored nouns can be specified for *complex* (repeated, circular or alternating) movement or *simple* (straight or arc) movement (Pfau and Steinbach 2006:147).

Complex Movement

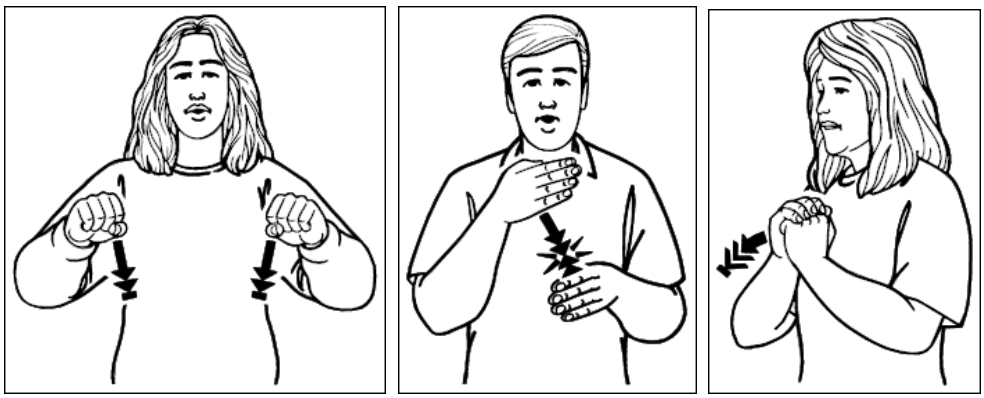
Complex movement is defined as inherent lexically specified repetition, and circular or alternating movement (Pfau and Steinbach 2006:147).

[3] Appendix A lists the notation used for representing NZSL data in this paper. In examples showing ungrammatical reduplication, the number of iterations is always given as 3. This is to be taken to represent that any number of iterations is ungrammatical.

STUDENT, JOB and FRIEND shown below in figure (2) are examples of NZSL nouns that have inherent, lexically specified, repetition. The hands are moved downwards twice in the articulation of each sign. This movement is represented in the still images by the double arrows.

Figure (2) Nouns with inherent repetition

(a) STUDENT (b) JOB (c) FRIEND



In the corpus, neither STUDENT, nor JOB, nor FRIEND was found in a reduplicated form. It can be reasonably concluded that nouns with inherent repetition cannot be reduplicated, with either simple or sideways reduplication, to form a plural. This is illustrated by examples (3) – (5).

3) STUDENT
*STUDENT++
*STUDENT>>
'students'

4) JOB
*JOB++
*JOB>>
'jobs'

5) FRIEND
*FRIEND++
*FRIEND>>
'friends'

BICYCLE is a prime example of a noun with complex movement. It combines repetitive, circular and alternating movements. The hands move alternately in circles two times, as shown in figure (3).

Figure (3) Noun with complex movement

BICYCLE

When referring to plural bicycles the noun BICYCLE was not reduplicated to mark it for this plurality; this is illustrated below.

6) BICYCLE
*BICYCLE++
*BICYCLE>>
'bicycles'

It can be reasonably concluded that, similar to what Pfau and Steinbach (2006) found for DGS, and Pizzuto and Corazza (1996) found in LIS, NZSL nouns that have complex movement cannot be reduplicated to show plurality. The question of how these nouns are understood to refer to plural entities is covered in sections 3.2 through 3.6.

Simple Movement

Nouns with simple movement may be articulated to one side of the signing space, which Pfau and Steinbach term 'lateral nouns' (2006:144), or in the neutral, central part of the signing space, nouns which I will refer to as 'central'.

Lateral Nouns

Lateral nouns are one-handed and articulated to one side of the signing space.
The noun PERSON, which occurred with high frequency in the corpus, is a lateral noun. Its form is shown in figure (4).

Figure (4) Lateral noun

PERSON

In NZSL, lateral nouns seem to be able to be reduplicated to express plurality, and are displaced sideways, away from the signer. This is referred to as 'sideways reduplication' (Pfau and Steinbach 2006:143). PERSON in its reduplicated form PERSON>> 'people' is shown below in figure (5).

Figure (5) Reduplication of lateral noun

PERSON>>

PERSON was always found to reduplicate sideways (PERSON>>); it was never reduplicated without this sideways displacement, nor was it ever found in a non-reduplicated form when referring to multiple people. PERSON was unreduplicated when referring to one person.

7) *PERSON
*PERSON++
PERSON>>
'people'

Central Nouns

Central nouns are articulated in the middle of the signing space, in front of the chest or stomach.

APPOINTMENT and TIME are central nouns, articulated with one downwards movement,[4] as shown in figure (6).

Figure (6) Central nouns

(a) APPOINTMENT (b) TIME

APPOINTMENT and TIME were found in reduplicated form. The reduplicated form was repetition of the base, with no spatial displacement, what Pfau and Steinbach (2006) refer to as simple reduplication.

It is important to note that the sentence in which the reduplicated form of these nouns occurred was part of a sequence in which the signer was expressing not only the plurality of the appointments and times on a list, but also the excess of them. The sentence is shown in example (8).

8) LIST TIME++++ BOOKING APPOINTMENT+ NEXT++++ WELL MANY-too
'There is a list of all the times and appointments, one after another, after another, it's just too many'

The interpretation of this sequence as describing an excess of appointments and times may have contributed to the repetition of the nouns APPOINTMENT and TIME. Thus, it cannot be said with certainty whether nouns like these, centrally articulated with a simple movement, can be reduplicated to exclusively express the plural.

[4] Some signers use two small movements in TIME; the effect of variation such as this on the reduplicatability of a noun would be interesting to investigate.

More data are needed to confirm the exact phonological constraints on reduplication on NZSL nouns.

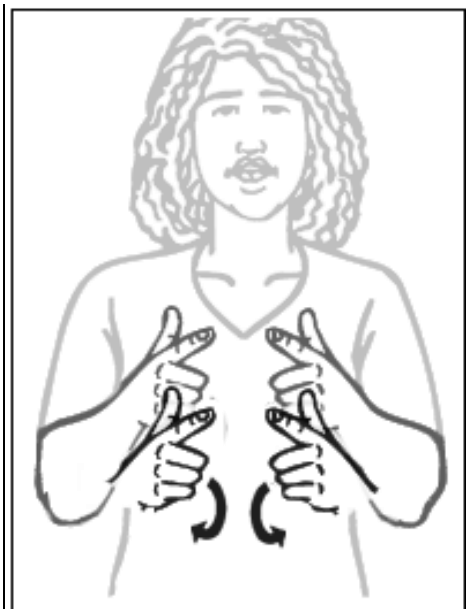
3.1.3 Spatially Motivated Reduplication

Reduplication of nouns may be used for purposes other than to mark a noun purely for plurality. Reduplicants may be meaningfully displaced in space. In these types of utterances, the reduplication is not only used to morphologically mark plurality on a noun, but also entails a specific spatial interpretation of the entities' location in real life space. The following example (9) at first glance appears to show that the centrally articulated noun LANGUAGE is reduplicated downwards, the form of which is shown in figure (7).

9) READ-down-on-machine LANGUAGEv
'I read down the list of languages on the machine'

Figure (7) Spatially motivated reduplication

LANGUAGEv



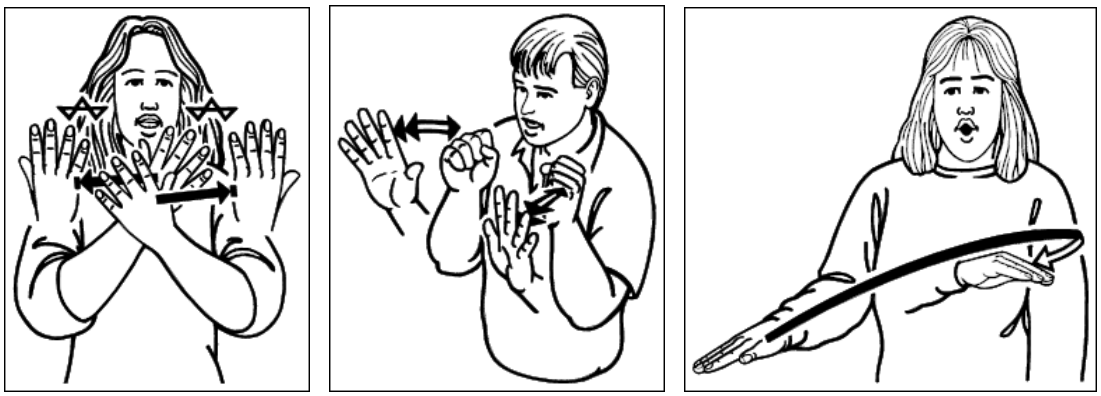
The interpretation of the sentence in example (9) is that there is a list of languages. Hence, the reduplication serves not only to pluralize the noun LANGUAGE, but also to give the entities a specific spatial interpretation; there are languages in a list.

3.2 Quantifiers

Quantifiers such as MANY, LOTS and ALL (figure 8) were often found to be used to mark the plurality of nouns in NZSL in the corpus.

Figure (8) Examples of NZSL plural quantifiers

(a) MANY (b) LOTS (c) ALL



Example (10) shows the quantifier LOTS preceding the noun phrase (NP) MAORI STUDENT 'Maori students'.

10) LOTS MAORI STUDENT FINISH FINALLY GRADUATE
'Lots of Maori students have finally graduated'

Example (11) shows that the quantifier can also follow the NP, which in this case is WORK FRIEND.

11) HAVE WORK FRIEND MANY IN CLASS
'I have many work friends in my class'

An example of a quantifier occurring in a sentence with a reduplicated noun was not found in the corpus, but according to native signers this construction is a possibility in NZSL, at least for the noun PERSON.

12) MANY PERSON>>
'many people'

It is interesting to note that while this pattern is acceptable in NZSL and in LIS (Pizzuto and Corazza 1996:184), a quantifier cannot occur with a reduplicated noun in DGS (Pfau and Steinbach 2006:164). Elicitations of grammaticality judgments from native signers would help to further explore the acceptability of quantifier and reduplicated noun constructions in NZSL.

3.3 Numerals

Numerals are often incorporated in NZSL sentences. When the numeral is greater than one, the noun it refers to must be interpreted to be plural. Example (13) and (14) show how numerals are used in sentences. The numeral precedes the noun to which it refers.

13) PRO1 TWO BROTHER TWO SISTER
'I have two brothers and two sisters'

14) TWO LECTURER
'two lecturers'

In the above examples BROTHER, SISTER and LECTURER are all unable to be reduplicated due to their inherent complex movement. However, it was found that numerals can occur with a reduplicated noun, as shown in example (15), a pattern which is ungrammatical in DGS (Pfau and Steinbach 2006:170).

15) ABOUT SIX PERSON>
'about six people'

As can be seen in the above example, the number of iterations in the reduplicated noun does not have to match the numeral. Consultation with native signers suggests that, for PERSON at least, the unreduplicated form is ungrammatical in sentences with a numeral above one. More research is needed to ascertain whether this NP internal agreement is a general pattern for reduplicated nouns in sentences with numerals.

When occurring with the numeral ONE, the reduplicatable noun PERSON was found in its singular, unreduplicated form. It could be reasonably inferred that the reduplicated form would be ungrammatical in this context, akin to saying *one people* to refer to a single person in English.

16) ONE PERSON
*ONE PERSON>>
'one person'

Note again that only the noun PERSON was considered in this example, and more elicitations of plural sentences likely to have a reduplicated noun would be advantageous for further research.

3.4 Classifier constructions

In signed languages, a signer is able to indicate an entity and describe what it looks like, how it moves, its location, etc., through the use of 'classifiers'. McKee and McKee note that classifiers 'often visually resemble the appearance, placement and action of things in the real world' (2007:73).

Classifier constructions were found to be used to represent the plurality of an entity. Unlike quantifiers and numerals, however, classifier constructions often included more information than simple plurality.

In example (17) below, the plurality of the NP DEAF STUDENT is realized through a classifier construction representing a group of people.[5]

17) ALWAYS MIX WITH DEAF STUDENT CL-55-mingle
'I always mixed with the Deaf students'

[5] Appendix B contains information on the notations used for classifier constructions, as well as a list of hand-shapes referred to in this paper.

The 5 hand-shape in the above construction, articulated with both hands, is used to visually represent a group of people. In addition to representing the plurality of the NP DEAF STUDENT, the classifier describes the action of the students.

Classifiers may be reduplicated to indicate the plurality of the noun they refer to. In example (18), the Y hand-shape is articulated on both hands simultaneously, with alternating repetition of the movement to represent both the plurality of the NP SMALL PLANE, and to indicate the iterative aspect of the planes coming and going. [6]

18) SMALL PLANE CL-YY-arrive-and-leave++++
'Small planes arrive and leave (constantly)'

Example (19) is an example of a classifier construction that pluralizes the noun FOOD and describes the spatial layout of the food.

19) DELI, COOK FOOD CL-55->>
'At the deli, I cooked the (items of) food which were laid out beside each other'

The 5 hand-shape, facing downwards, is used to represent an item of food, and is articulated on both hands. The hands are moved successively outwards from the centre of the signing space with each reduplication. This construction simultaneously represents the plurality of the noun FOOD and the spatial layout of the items. The outwards movement is crucial in this utterance. If the reduplication was not displaced, this would result in a different interpretation of the utterance, possibly that the food was laid out in a tower.

Classifier constructions can occur with a quantifier, such as in example (20) below. Note that the noun phrase is not overtly realized, as it is made apparent by the discourse context and the hand-shape of the classifier which unambiguously refers to PLANE.

20) MANY CL-YY-plane-arrive+++
'many planes arriving'

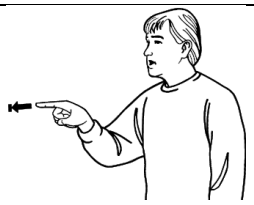
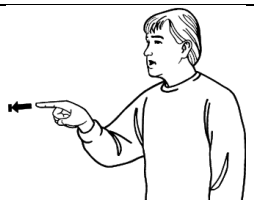
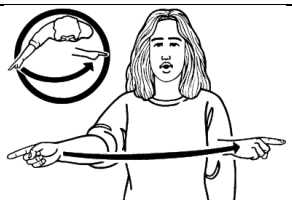
In example (20), the two hands in the Y hand-shape move alternately, showing the iterative aspect, and, with the quantifier, also express the plurality of the unexpressed NP.

3.5 Pronouns

In terms of number, the NZSL pronominal system makes distinctions between singular, dual and plural. The basic system is shown below in table (2). This table is based on the system illustrated in the Dictionary of NZSL (Kennedy 1997), and information in McKee and McKee's (2007) Grammar of NZSL.[7]

[6] Since this construction is articulated with two hands alternating movement, the + sign refers to the total number of reduplicants (ie, the right hand plus the left hand).
[7] Some variants in the form of pronouns are not recorded in table (2).

Table (2) NZSL pronominal system

	Singular	Dual	Plural
First person			
Second person			
Third person			

As can be seen from the table above, the plural pronouns often include a sweeping motion, the size of which can 'indicate the relative size of the group' (McKee and McKee 2007:11). It was found in the corpus that a dual or plural pronoun is often used preceding or following a non-reduplicated noun to express its plurality.
Example (21) shows the first person plural pronoun used at the beginning of a sentence, and the subject NP MAORI DEAF 'Maori Deaf people' following the pronoun. The noun INTERPRETER, though understood to be plural or collective, is not marked at all for plurality.

21) PRO1-plural MAORI DEAF INSPIRE INTERPRETER
'We Maori Deaf (people) inspire interpreters'

In the above example, the pronoun is not acting as a replacement for an NP, but instead is used in conjunction with the overt NP to indicate the plurality of it. In this way, it could be said that while pronominal in form, PRO1-plural is in fact acting as a determiner.[8] An English example is given below (22) to show how a determiner can be used to disambiguate the singular and plural interpretation of the noun when number is not marked on the noun itself.

22a) This sheep

22b) Those sheep
(Based on examples from Corbett 2000:66)

[8] Note that the interpretation of the example is not 'we *are* Maori Deaf', in which case PRO1-plural would be said to be acting as a pronoun.

Pronouns may also follow the noun with which they are co-referential, as in example (23) below.

23) FAMILY WANT GOOD PRO1 BECOME PERSON WHO WORK DEAF PRO3-plural HELP-them
'My family really wants me to become someone who works with Deaf people, to help them'

In this example, the pronoun PRO3-plural is used to establish a spatial reference for DEAF 'Deaf people', at which the agreeing verb HELP is then directed. Verbal agreement will be further discussed in section 3.6.

In example (24) the plural pronoun referring to WOMAN is repeated sentence finally, a common pattern in NZSL (McKee and McKee 2007:14).

24) PRO3-plural WOMAN NOTHING MAN PRO3-plural
'They were all women, no men'

The above example shows that a sign such as WOMAN, which is body anchored and unable to be reduplicated (see section 3.1), can be given a plural interpretation by virtue of a plural pronoun which is co-referential with it.

McKee and McKee discuss the availability of trial and quadral pronouns in NZSL, but note that they are used less frequently than the dual pronouns (2007:13). Use of a trial pronoun is illustrated in example (25) below. The signer clarifies who works together with the use of the first person trial pronoun, formed with a 3 hand-shape moving in small circles close to the signer's chest.

25) THERE TWO PRO1 WORK MOST WITH PRO1-trial
'I work most with those two, the three of us'

3.6 Verbal Agreement

In NZSL, about 18% of the 111 most commonly used verbs are what is referred to as agreement verbs (McKee and McKee 2007:25). Agreement verbs inflect to give information about person and number. The plurality of the grammatical object may be indicated through the verbal agreement. The object may be overtly expressed, or understood from the context.

In example (26) the signer is discussing employment. The unexpressed object is understood to be 'jobs', the plurality of which is understood through the reduplication of the verb GET.

26) THERE WELLINGTON EASY GET+++ EASY
'In Wellington, it's easy to get them [jobs]'

In example (27) below, the object is expressed following the reduplicated verb PICK. The signer is discussing how she gives sign names (personal names in sign language, usually based on a physical characteristic of each person) to her students.

27) NOW PRO1 PICK>> NAME SIGN
'Now I pick name signs [for the students]'

The verb PICK is displaced sideways. This is possibly to show that the signer picks sign names for each of her students in turn.

Example (28) below shows another instance in which the verb TEACH is reduplicated and displaced to agree with its object, in this case the plural CHILDREN.[9]

28) WHY TEACH>> PRO3-plural CHILDREN ENJOY LOVE SIGN
'Why teach them? All the children enjoy it, they love signing'

The three examples above all show reduplication of the verb to express its agreement with a plural subject, but this is not always the case. A smooth, sweeping arc movement may be used, which has the interpretation of 'all recipients receiving an action collectively' (McKee and McKee 2007:31). This is the case in example (29) below, repeated from example (24).

29) FAMILY WANT GOOD PRO1 BECOME PERSON WHO WORK DEAF PRO3-plural HELP-them
'My family really wants me to become someone who works with Deaf people, to help them'

3.7 Suppletion: PEOPLE

Suppletion is described by Corbett (2000:289) as the most structurally irregular method of plural marking. It is when a plural form phonologically unrelated to the singular form is used. An example of suppletion in Russian is given below.

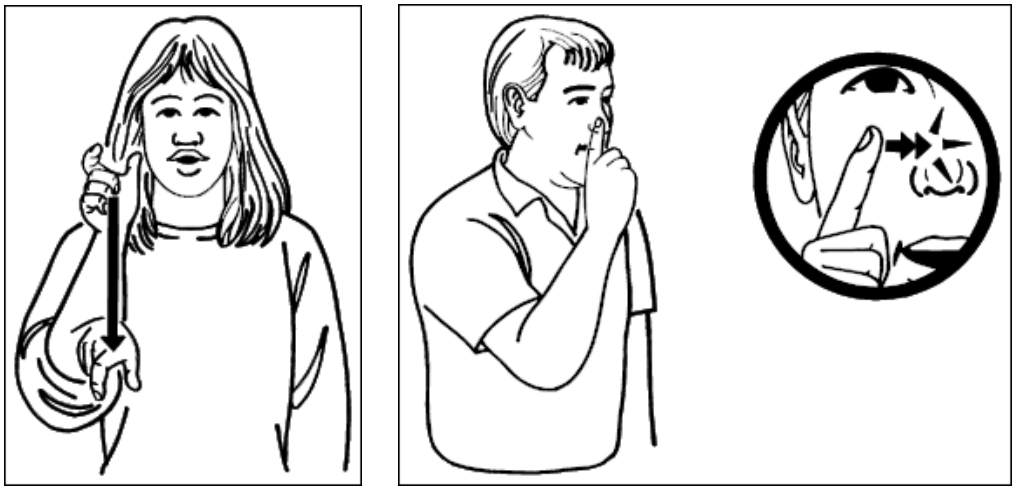
30) čelovek 'person'
ljudi 'people'
(Corbett 2000:140)

There is one case in NZSL where a plural form of a noun has no phonological relationship to the singular form. The plural of PERSON can be expressed in two different ways. One is the sideways reduplicated form seen in section 3.1.2 in reference to lateral nouns. The other is a form that is phonologically unrelated to the singular PERSON (figure 9a), a case of suppletion. This plural form is generally glossed as PEOPLE, and is illustrated in figure (9b).

[9] This form is discussed further in section 3.8.

Figure (9) Suppletion in NZSL

(a) PERSON (b) PEOPLE



PEOPLE shares no phonological parameters with PERSON. They differ in location, movement and hand-shape.
An example of the use of PEOPLE in a sentence is given below, in which DEAF is used as an adjective.

31) SOCIAL WITH DEAF PEOPLE
'I socialize with Deaf people'

PEOPLE was found in co-occurrence with a quantifier. In example (32) below, the signer's addition of the non-manual expression leads to the interpretation of '*too* many people'.

32) MANY PEOPLE
'(too) many people'

PEOPLE may also be used in conjunction with classifier constructions. In example (33) the classifier constructions on either side of PEOPLE give information about plurality, the spatial positioning, and the posture of the people.

33) CL-44-people-in-semi-circle PEOPLE CL-VV-people-seated-in-semi-circle
'There were people in a circle, sitting in a circle'

Like PERSON>>, PEOPLE can never be used in the singular form, for example with the numeral ONE. That PEOPLE is used exclusively as a plural is also noted in the Dictionary of NZSL (Kennedy 1997).

34) *ONE PEOPLE

There may be a semantic distinction between the plural forms PEOPLE and PERSON>>. PERSON>> is used more to refer to individuals, whereas PEOPLE refers to a large groups, or people in general. Elicitations and judgments of grammaticality would be

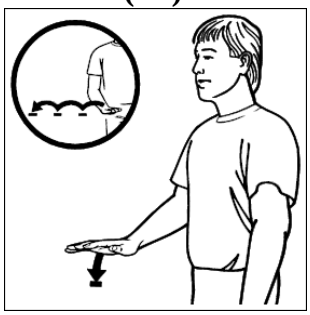
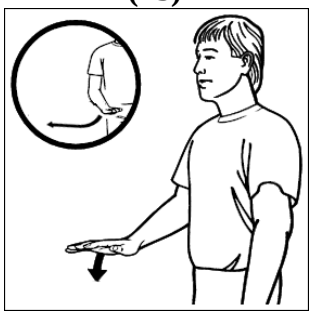
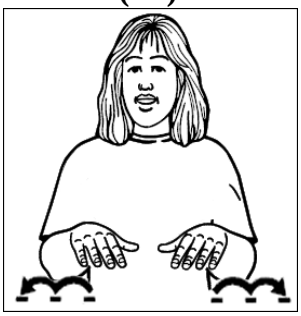
useful in order to ascertain whether there are situations in which PEOPLE is preferred over PERSON>> and vice versa.

3.8 Lexicalized plural: CHILDREN

It appears that the plural form of CHILD has become lexicalized in NZSL. This is shown by the phonological alterations that take place in some signers' articulation of the sign CHILDREN from what would be expected if the form was seen as a reduplication of the singular CHILD.

There are several possible variations on the articulation of CHILDREN, which are shown below in table (3).

Table (3) Variation in the articulation of CHILDREN

	Reduplicated movement	**Smooth movement**
One handed	**(1R)** 	**(1S)** 
Two handed	**(2R)** 	**(2S)** 

The citation form of CHILDREN is 1R, articulated with one hand and a 'bouncing' reduplicative movement. This variant is the closest in form to a reduplicated CHILD. The other forms deviate from what would be expected in a reduplication of CHILD. The smooth movement (1S and 2S) could be a result of phonological reduction, reducing the 'bouncing' reduplicative movement to a single sweeping one.

The variation between one-handed and two-handed articulations of children is part of a recognized pattern in NZSL, with many signs exhibiting both one-handed and two-handed variants. This may be due to either the addition of a hand, or the dropping of the non-dominant hand (Kennedy 1997). In the case of CHILDREN, it could be that the sign evolved from a reduplicated form of CHILD (1R) and the non-dominant hand was added to produce the two handed variants (2R and 2S).

Aside from the phonological variation in CHILDREN, the way in which the sign is treated in the Dictionary of NZSL (Kennedy 1997) and in the corpus gives weight to the argument that it has, to an extent, become lexicalized as a plural form. In the Dictionary of NZSL (Kennedy 1997), the glosses CHILD and CHILDREN are contained under one NZSL entry, illustrating the citation form 1R. It is noted in the textual description of the sign that the hand is moved downwards once for CHILD and twice or more for CHILDREN. In the corpus on which this study was based, the sign CHILDREN (all variants) is glossed as such, and not as CHILD++.

It remains to be seen what implications the lexicalization of a plural form carries. It may be simply a perceptual difference, that signers do not analyse the lexicalized plural CHILDREN as a reduplicated CHILD. It is also possible that there are syntactic differences between the lexicalized plural and one which is formed through reduplication, such as verbal agreement and pronoun co-reference. More research is needed to find out whether there are differences, and if so, what these differences are.

3.9 Co-occurrence of plural marking strategies

From results obtained through the corpus, and in consultation with native signers, it was found that reduplicated nouns can co-occur with all other syntactic processes of plural marking. The following table shows how reduplicated nouns can be combined with other plural marking strategies.

Table (4) Reduplicated nouns and co-occurring syntactic plural marking

	Grammatical?
Quantifiers	yes
Numerals **- PLURAL** **- ONE**	 yes no
Classifiers	yes
Pronouns	yes
Verb agreement	yes

As table (4) shows, it was also found, unsurprisingly, that it is ungrammatical to have the numeral ONE and a reduplicated noun. This suggests that there needs to be internal agreement between the elements of the NP. Many nouns are not marked for plurality through reduplication, and so the syntactic strategies for marking plurality are important in NZSL. Some of the syntactic plurality marking may also co-occur within one sentence, for example a quantifier and a classifier construction indicating plural entities, a numeral and a classifier construction. The full extent of the co-occurrence of syntactic strategies of plural marking in NZSL remains to be researched.

It is possible that some plural marking strategies and combinations thereof are preferred over others. For example, no instances of a quantifier with a reduplicated noun were found in the corpus, although this combination was evaluated as acceptable by native signers. Further research – with a goal of learning which plural marking strategies, and which co-occurrences of plural marking strategies, are grammatically more acceptable and quantitatively more common in discourse – would be beneficial.

4. Conclusions

As illustrated in section 3 by various examples, the main strategies for marking nominal plurality are as follows:

- Reduplication
- Quantifiers
- Numerals
- Classifier constructions
- Pronouns
- Verbal agreement

Reduplication is the only purely morphological process by which NZSL nouns may be marked for plurality. It was found that, where possible, the noun in the NP agreed with other elements such as quantifiers and numerals for plurality, though the exact number of reduplications seems unimportant. Reduplication was found to be constrained by phonological variables. Nouns that were body anchored or contained complex movement were unable to be reduplicated, while nouns articulated in the central or lateral signing space with simple movement could be reduplicated. There also seems to be a link between the reduplication of nouns and the expression of excess or intensity. This bears further investigation. Reduplication can also be used to express more information than pure plurality. Often, reduplicated nouns are displaced to give a specific spatial interpretation to the utterance.

Because the majority of nouns in NZSL are not overtly marked for plurality through reduplication, due to phonological constraints, a number of other strategies are used. Plurality may be marked through the use of quantifiers, numerals, classifier constructions or pronouns.

Quantifiers such as MANY or LOTS can be used to point to the plurality of an NP which is unable to be reduplicated to mark it morphologically for plurality. Quantifiers can also occur with the reduplicated form of PERSON, and more research is needed to see whether or not quantifiers can co-occur with other nouns in reduplicated form.

Numerals are often used within a sentence, and can occur with reduplicated nouns or nouns unmarked for plurality. When occurring with reduplicated nouns, the numeral and the number of reduplication need not agree.

Classifier constructions are often used to express the plurality of entities. The classifier used must agree with the class of noun it represents. Plurality can be marked in classifier constructions through hand-shape (eg, the 5 or 4 hand-shape to represent a group of people), the use of two hands (eg, 2 Y hand-shapes to represent two aeroplanes), and reduplication (eg, the reduplication of the movement of the Y hand-shape to represent multiple aeroplanes). Classifier constructions give more information about entities than plurality. They may also give information about location, movement and appearance.

Plural *pronouns* are used in a similar fashion to determiners to introduce a noun phrase, marking it for plurality. They can also be used within a sentence to disambiguate a noun unable to be marked for plurality through reduplication.

A certain class of *verbs* are able to be moved in space to agree with their object, and plurality of the nominal object may be marked through reduplication and spatial displacement of the verb's movement path, or plain arc movement of the verb. The object may be overt or covert.

Finally, there was one case of *suppletion* in NZSL, where the plural PEOPLE is phonologically unrelated to the singular form PERSON. The noun PERSON can also be reduplicated to show plurality, and so there are two morphological options for the plural of PERSON. Further research and investigation would be useful to ascertain whether there are subtle semantic or syntactic differences between the two plural forms PEOPLE and PERSON>>.

Many of the plural marking strategies encoded more information than straight up plurality. Reduplicated nouns can be displaced in space to give a spatial interpretation of the entities; classifier constructions encode information about entities' appearance and movement; and verbal agreement can encode information about how an action was performed with regard to the entities (eg, simultaneously, exhaustively).

There is still much more to be learned about plural marking in NZSL and signed languages in general. In particular, the following areas were identified as potentially fruitful for further research:

- further investigation of phonological constraints on reduplication, with a wider data set
- the interaction and co-occurrence of plural marking strategies, especially cross-linguistic comparisons
- the question of which plural marking strategies and combinations thereof are preferred in discourse, in terms of grammatical acceptability and quantitative use
- the question of whether the choice for the plural of PERSON, either reduplication or PEOPLE, is dependent on factors such as semantics
- the lexicalisation of plurals such as CHILDREN (possibly historically formed by the reduplication of CHILD), and the question of whether signers analyse the form as a morphological process or part of the phonology of the sign

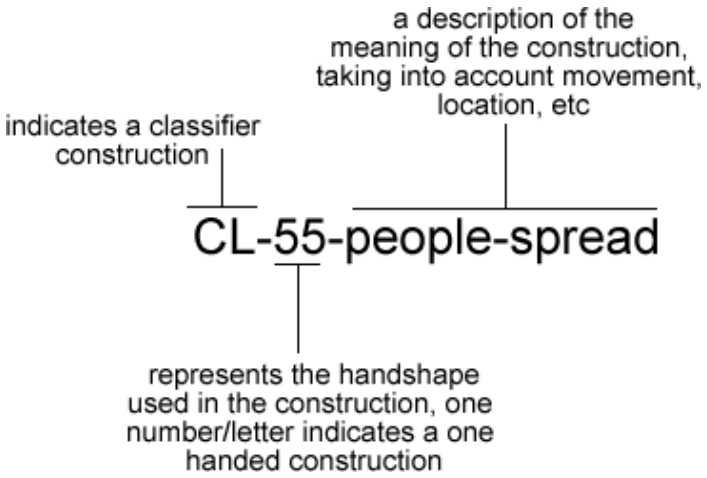
Overall, this paper has provided an overview of plural marking strategies in NZSL, and provided directions for further research into the area.

Appendix A: General Notation Conventions

SIGN	Signs are glossed in capital letters
SIGN++	The gloss indicates the base and the + signs indicate reduplicants. For example, SIGN++ indicates three iterations of SIGN
SIGN>>	The gloss indicates the base and the > signs indicate reduplicants which are displaced sideways. For example SIGN>> indicates three iterations of SIGN, displaced sideways
SIGNvv	The v indicates downwards displacement of reduplicants
SIGN-SIGN	Two glosses joined by a dash indicate the production of one sign that requires more than one English word for a suitable gloss
SIGN-not	Sign negated by non-manual marking on the head and face
SIGN-too	Sign modified with non-manual marking on the face
SIGN-alt	Variation on articulation of a sign (phonological)
*	Construction ungrammatical on basis of evidence. Formal elicitation of grammaticality judgements were not performed
PRO1	First person singular pronoun
PRO2	Second person singular pronoun
PRO3	Third person singular pronoun
PRO3-plural	The dual and plural pronouns are indicated as shown here

Appendix B: Classifier construction notations

The best attempt has been made to accurately describe classifier constructions. The following diagram describes the form of the notation.



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A preliminary formal syntactic analysis of *wh*-questions in New Zealand Sign Language

Sophia Jarlov Wallingford

Abstract

This paper presents a preliminary syntactic analysis of *wh* question constructions in New Zealand Sign Language (NZSL). In NZSL, *wh* words can appear sentence initially, sentence finally, or both (McKee 2006:73). When there is a pronoun referring to the subject of the sentence, this appears sentence finally, after the *wh* word. This data is explained by analysing the structure as a result of the copying of subjects to a focus position in CP. This can be a copy of either a *wh* subject, or of a pronoun relating to the subject of the clause when the *wh* argument is not a subject. The IP then moves to a position higher than Foc, and the *wh* word moves to [Spec,CP] to check the [+wh] features in C. In the case of *wh* objects, the IP raises to a position above Foc, and the *wh* object may move overtly to [Spec,CP] to check the [+wh] features in C.

1. Introduction

1.1 General introduction

This paper will examine *wh* constructions in New Zealand Sign Language (NZSL), and present a preliminary syntactic analysis of these. I will begin with a brief introduction to NZSL, before examining some important considerations in sign language syntax research. Following this, data from NZSL will be presented and compared with findings from ASL. Finally, I will propose several possible analyses for the structure of *wh* questions in NZSL.

NZSL is the visual-gestural language used by the Deaf community of New Zealand. Similarity of the lexicons suggests that NZSL is related to British Sign Language (BSL) and Australian Sign Language (Auslan) (McKee and Kennedy 2000; Johnston 2002).

1.2 Syntactic assumptions

For this project, the assumption is made that the C head contains [+wh] features that must be checked by a phrase also carrying these features. This feature checking is the motivation for movement of *wh* phrases (as described in Hornstein et al 2005).

Two main questions are to be addressed in this paper:

1. Where do *wh*-phrases appear in clauses in NZSL?
2. Can the position of *wh*-phrases in New Zealand Sign Language be analyzed in accordance with Kayne's (1994) Linear Correspondence Axiom (LCA), which states that all syntactic movement is leftwards?

1.3 Sign Language Syntax

Though for many years signed languages were thought to be devoid of basic grammatical rules such as word order, it has been shown that they, like spoken languages, have a hierarchical syntactic structure (see especially Neidle et al 2000).

One important aspect of signed languages is their grammatical use of non-manual marking (NMM). NMM involves expressions articulated on the face in conjunction with manual signs articulated on the hands. In NZSL, NMM can be used, amongst other things, to signal negation, topics, yes/ no questions and *wh* questions (McKee 2006, McKee and McKee 2007).

In glosses, the NMM is represented by a line above the glossed signs in capitals as shown below.

1) _____wh
YOU NAME WHAT

Neidle et al (2000) have claimed that NMM is associated with the abstract syntactic features that are in the heads of projections. For instance, they maintain that the NMM associated with *wh* questions is a manifestation of the [+wh] syntactic feature. They argue that the NMM spreads optionally over the C-command domain when manual signs are locally available to the NMM, and obligatorily over the clause (Neidle et al. 2000:45).

Other researchers do not make such claims about NMM, arguing that NMM simply spreads over the entire clause obligatorily, and analyzing instances where NMM has not spread over the entire clause as, in fact, two separate clauses (Petronio and Lillo-Martin 1997:47). Zeshan (2004), who led a cross-linguistic study on interrogatives, claims that NMM is 'equivalent to intonation in spoken languages' (Zeshan 2004:18), and that it is not as important in *wh* questions as it is in *yes/ no* questions, where NMM may be the only indication of a question. Indeed, in a later paper, Neidle (2002) notes that there may be some NMM (for example, that associated with focused DPs, relative clauses, conditional clauses) that is *not* a reflection of syntactic features, though she maintains that the NMM associated with *wh* question does reflect these features (Neidle 2002:87).

This paper advocates neither for nor against the claims that Neidle et al (2000) make for the syntactic role of *wh* NMM, but will keep this analysis in mind when considering the data from NZSL.

2. Data

2.1 Data sources

The main source of data for this paper came from student videotexts (New Zealand Sign Language Teachers' Association 2000). These videotexts were designed as a

pedagogical tool for hearing students learning New Zealand Sign Language. This should be kept in mind when considering this data, as the signed discourse will not be as natural as when Deaf people are signing with each other in a conversational setting. Additional examples came from the video files accompanying McKee's (2006) article on interrogative and negative constructions. The data from that article were either selected from a corpus of signs in natural discourse, or were examples elicited by McKee for the purposes of her article.

Data showing word order in NZSL statements will be presented, followed by data showing the word order and distribution of NMM in *wh* questions.

2.2 Word order in statements

The basic word order of transitive sentences in NZSL is SVO (McKee & McKee 2007:4).

2) ME LOOK-FOR JOB
'I'm looking for a job'[1]

Often subject pronouns are repeated at the end of the sentence as in example (3).

3) ME LOOK-FOR JOB, ME
'I'm looking for a job'

Topic and focus constructions are also productive in NZSL, and this can often result in differing word orders. Topics are realized in sentence initial position and NMM, which consists primarily of raised eyebrows. Example (4) shows an O SV ordering in a topic comment structure.

4) _____t
PARTY, fsKEN GO
'As for the party, Ken's going'

2.3 Word order in *wh* questions

There are several possible word orders for *wh* questions. McKee (2006.73) states that:

> the interrogative [*wh*] sign may occur in clause initial position, clause final position or be repeated in both. Clause final, or repeated at beginning and end are preferred patterns.

These statements provide a useful introduction to the positioning of *wh* questions in NZSL. This paper will aim to provide a more in depth syntactic analysis of this positioning, with supporting examples from NZSL data.

[1] Conventions used in this paper for representing signed discourse can be found in the Appendix

2.3.1 Sentence initially

As mentioned earlier, *wh* elements may also appear in a sentence initial position, though this is not preferred (McKee 2006:73), and examples of this ordering are rare in the data collected.

5) _____ wh
WHEN YOUR BIRTHDAY
'When is your birthday?'

6) _____wh
HOW-MANY SISTER HAVE YOU
'How many sisters do you have?'

The *wh* word WHEN in example (5) is functioning as the predicate or complement of the subject YOUR BIRTHDAY. It has clearly been moved out of situ to the sentence initial position. Similarly, HOW-MANY in example (6) has moved out of situ as the object of the verb to a sentence initial position.

Taken on their own, these types of *wh* word initial sentences seem to support a leftwards movement hypothesis. The fact that English questions are formed with the *wh* word sentence initially, and the relative rarity of this ordering in NZSL (McKee 2006:73), could be an indication that this word order appears under influence from English, the majority language in New Zealand.

2.3.2 Sentence finally

According to McKee (2006:73), *wh* phrases may occur in the final position in a *wh* question clause. In this position, the NMM may occur only over the *wh* word as in example (7a), or over the entire clause as in example (7b)

7a) ___wh
YOUR UNCLE WORK WHAT
'What does your uncle do/ work as?'

7b) _____wh
HIS FATHER WORK WHAT
'What does his father do/ work as?'

Because the *wh* word in these examples is also the object of the predicate WORK, and thus follows the predicate in situ, it is difficult to tell whether *wh* movement has taken place.

Two different distributions of NMM are found on this construction. This is similar to what Neidle et al (2000) found with ASL *wh* questions. They argue that when the *wh* phrase was moved to a clause final position, the NMM appeared just over the *wh* word, or optionally spread over the entire clause. With in situ *wh* words, the NMM obligatorily spread over the entire clause. Under this analysis, the *wh* word in (7a) would have undergone movement to the right periphery, to license the use of NMM only over the *wh* word, an analysis illustrated in example (8).

8) _____wh
[YOUR UNCLE WORK t_i]$_{IP}$ WHAT$_i$

Petronio and Lillo-Martin (1997) claim that NMM spreads over entire clauses. Their analysis would seem to claim that clauses such as (7a) are actually made up of two separate clauses to explain the lack of NMM over the first part. Petronio and Lillo-Martin's (1997) analysis applied to (7a) is shown below as example (9). The dual clause construction is reflected by the English translation.

9) ___wh
YOUR UNCLE WORK WHAT
'Your uncle works. (As) what?'

Sentences such as 7(b) would simply be analyzed as a single clause under Petronio and Lillo-Martin's (1997) proposal; as the NMM spreads over all the manual material, it would be said to constitute a single clause. More research is needed into both ASL and NZSL questions to ascertain whether there are pragmatic, prosodic and semantic differences between the types of sentence shown in 7(a) and (b), where the spread of NMM is different in otherwise syntactically identical constructions. This would also be useful in determining whether an analysis similar to Petronio and Lillo-Martin's, where NMM is said to spread over clauses, could be applied to NZSL.

No examples were found in the NZSL data of single, sentence-final *wh* subject. *Wh* subjects were only found occurring sentence-finally when the *wh* word also appeared sentence initially; these constructions are discussed below in section 3.3.3.

2.3.3 Sentence initial and sentence final

The majority of the data collected exhibited the pattern of one *wh* word at the beginning of the clause, and one at the end, where the *wh* words corresponded to a single argument, as shown in example (10) with the *wh* word referring to the subject of the clause.

10) _____wh
WHO CAN BABY SIT WHO
'Who can baby-sit?'

Whenever there are two *wh* words in an NZSL sentence, the *wh* NMM spreads over the entire phrase. The same phenomenon is found in ASL, and has been explained by some as perseveration in the non-manual channel (Neidle et al 2000:118). When there are two instances of a lexical *wh* item, they both carry the abstract [+wh] features, and so once the NMM corresponding to these features has begun to be articulated, it continues to be, perseverating to the second instance of a [+wh] feature. Petronio and Lillo-Martin (1997) argue that NMM spreads over clauses in ASL, so would explain the spread of NMM in (10) by saying there is a single clause.

Example (10) shows the *wh* phrase corresponding to the subject of the clause appearing in a sentence initial position, the in situ position for a *wh* subject such as this, and also in a moved, phrase final position. Constructions with two *wh* phrases corresponding to single argument are also found commonly in ASL, according to

Neidle et al (2000:114). They analyze these in two ways: as final *wh* tags, and as initial *wh* topics.

When a double *wh* word construction corresponding to a single *wh* argument is a sentence-final tag, Neidle et al (2000) argue that the tag is accompanied by additional NMM, in the form of a slight head shake. A head shake is necessarily part of the associated *wh* NMM, and Neidle et al (2000:187) suggest that it is 'more pronounced' in the tag. A tag construction is a possible analysis for the rightwards-occurring *wh* questions in these double constructions.

The other explanation that Neidle et al (2000) give for double *wh*, single-argument constructions is that the first *wh* word is a base generated topic. They draw on evidence from NMM, the position of the *wh* topic relative to other topics, and their relationship with the second *wh* phrase in the sentence (Neidle et al 2000:115). In NZSL, clause initial *wh* words can co-occur with other topics, either preceding or following them.

11a) _____wh _____t _____wh
HOW-OLD YOU FIRST TIME YOU TRAIN, HOW-OLD YOU
'(How old were you), as for your first time on a train, how old were you?'

11b) _____t _____wh
INTERVIEW, HOW YOU COMMUNICATE HOW YOU
'As for the interview, how will you communicate?'

As seen by examples (11a and b) *wh* words can occur to the right or the left of a topic. More data would be needed to analyze the exact distribution of *wh* words with topics; for example, to ascertain whether or not more than one topic is involved, and whether or not a '*wh* topic' is ungrammatical.

Interestingly, in example (11a), though there are two occurrences of *wh* words, and therefore two nodes where [+wh] features appear, the NMM does not perseverate between these two, as would be expected by Neidle et al's (2000) approach. This could be because the topic marking on FIRST TIME TRAIN, which consists primarily of raised eyebrows, is inconsistent with *wh* NMM, primarily lowered or furrowed eyebrows, and takes precedence over it. Another explanation is that the *wh* NMM does not perseverate between the two nodes because the second occurrence of the *wh* word HOW-MANY is in fact in a separate clause. In example (11a), a noticeable prosodic break occurs between the topicalized phrase and the second *wh* word, indicated by the comma. This could be an indication of a separate clause, although in ASL it is also possible for a prosodic break to precede a tag (Neidle et al 2000:114).

2.3.4 With a generic *wh* sign

McKee (2006) discusses a generic *wh* sign used in NZSL, the distribution of which appears similar to that of a generic *wh* sign discussed by Neidle et al (2000:117). I will follow McKee (2006) in glossing the NZSL sign as INTERROG.

12a) WHAT SAY INTERROG[2]
'What did you say?'

12b) WHY LATE INTERROG
'Why are you late?'

McKee (2006) proposes that this sign, occurring sentence finally, is used pragmatically to 'soften the impact of a bald question' (McKee 2006:78). For the ASL interrogative sign, Neidle et al (2000) propose that it acts similarly to a pronoun which refers back to a specific NP topic antecedent, but in the case of *wh*, the generic interrogative refers to the first, more specific, *wh* word. This proposition is supported by examples that show the reverse order. That is, a generic interrogative followed by a specific interrogative, is ungrammatical. Elicitations of grammaticality judgments such as these would be advantageous for further analysis of NZSL syntax.

2.3.5 With a sentence final pronoun

A pronoun referring to the subject of the clause may be repeated at the end of the *wh* clause.[3] McKee and McKee (2007:3, 40) note that this kind of construction occurs in statements and *yes/ no* questions in NZSL. It also appears to be a common construction across signed languages, especially in *yes/ no* questions (Zeshan 2004:21). In NZSL, the data shows that repetition of a pronoun can also occur in *wh* questions. The antecedent may be overt, as in example (13a), or non-overt as in (13b). It should be noted that the *wh* NMM spreads over a sentence final pronoun when one is present.

13a) (_____) _____wh
YOU BEFORE WORK WHAT YOU
'What did you do/ work as before?'

13b) _____wh
LIVE WHERE YOU
'Where do you live?'

The pronoun refers to the subject of the main clause, as illustrated by example (14), a yes/ no question in which the sentence final pronoun refers back to the subject of the main clause (YOU) and not the subject of the subordinate clause (MOVIE).

14) _____yn
YOU KNOW MOVIE WHERE KNOW YOU
'Do you know where the movie (theatre) is?'

In ASL also, pronouns may occur in a sentence final position, though no examples involving *wh* questions were mentioned by Neidle et al (2000) or Petronio and Lillo-Martin (1997) in their work on ASL *wh* questions. Neidle et al (2000) propose two

[2] The NMM is not marked in these examples, given in the text body of McKee's (2006) paper, though it is most likely that the *wh* NMM extends over the entire clause.

[3] The term 'pronoun repetition' will be used henceforth, though the antecedent may not always be a pronoun, as it can be a NP. In cases such as this, the pronoun itself is not technically 'repeated', but the number and person of the NP is reflected in it (NZSL does not distinguish pronouns for gender).

separate constructions involving sentence final pronouns, analyzing some of them as tags and some of them as right dislocated and adjoined to CP. They admit that right adjunction is inconsistent with Kayne's 1994 approach (Neidle et al 2000:172). The pronouns that they analyze as tags are apparently accompanied by a NMM head nod.

In NZSL, A head nod accompanying sentence final pronouns in NZSL statements is also noted by McKee and McKee (2007:4). However, in *wh* questions, the *wh* NMM spreads to be co-articulated with the sentence final pronoun, and there is no head nod accompanying the pronoun. This may be because articulating the *wh* NMM, which includes a head shake and a head nod at the same time, is not possible.

3. Syntactic analyses of data

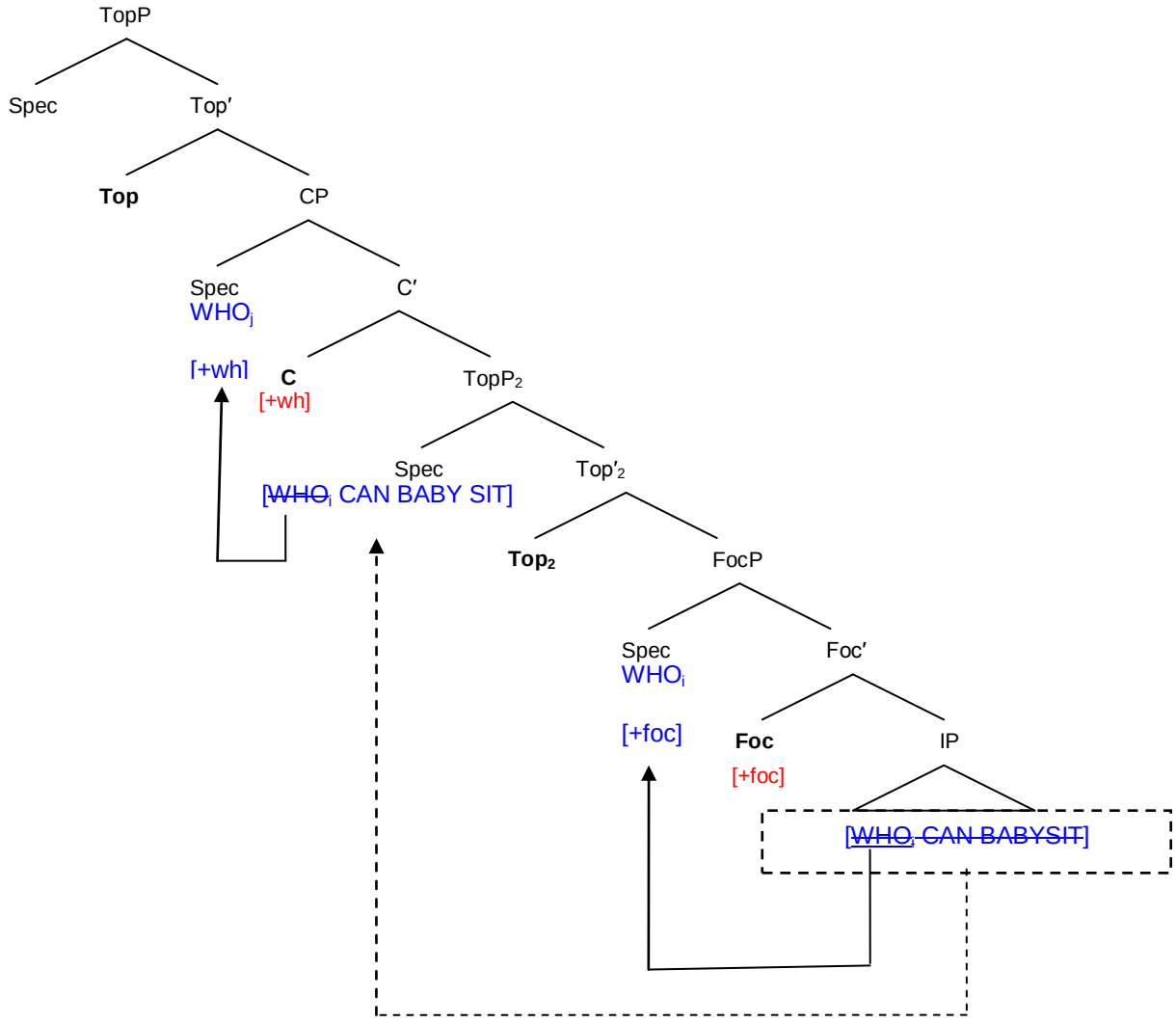
3.1 Leftwards movement and subject doubling

The following analysis is in line with Kayne's (1994) LCA, as all syntactic movement is leftwards, and the Spec positions are uniformly on the left of the head. The proposal consists of two parts, one explaining *wh* movement where the *wh* element corresponds to the subject of the verb, and the second explaining *wh* movement where the *wh* word's in situ position is post verbal. The structures here are based on Rizzi's (1997) analysis of left periphery.

This structure partially explains the apparent 'repetition' of pronouns and *wh* phrases, which appear on the right periphery of the sentence. I argue that the repetition of pronouns is in fact a repetition of the subject, with the rightwards-occurring pronoun ending up in a focus position. In addition, I argue that *wh* signs occurring sentence finally, when they correspond to the subject of the sentence (and thus cannot be explained as in situ), undergo a similar process of focusing. It would be expected that a repeated *wh* word corresponding to the subject of the sentence and a repeated pronoun cannot co-occur, as they are proposed to occupy the same focus position. This is an issue that may be resolved with further data collection, elicitation and grammaticality judgments to ascertain whether or not a sentence involving two focused elements is grammatical. If a sentence with both a focused (repeated) *wh* word and a repeated pronoun is ungrammatical, the analysis given here would be supported. The structure for the sentence given in example (10) and repeated below as example (15) is illustrated in Figure (1).

15) _____wh
WHO CAN BABY SIT WHO
'Who can baby-sit?'

Figure (1): *wh* subject



In the above tree, we can see that the subject *wh* word WHO, with [+foc] features copies out of the IP to the [Spec,FocP] position, which allows the [+foc] features in the head of FocP to be checked in a Spec-Head manner. I analyze the movement as a copy without deletion of the 'original' *wh* word. The entire IP may then move to a position I have called [Spec, TopP$_2$]. The higher TopP above CP can then be used for topic constructions where the topic appears sentence initially. To check the [+wh] features in C, the *wh* phrase can then move overtly or covertly to the [Spec,CP] position. This proposal accounts for the rightwards and leftwards occurring *wh* subject phrases, without resorting to rightwards movement which would be inconsistent with Kayne's (1994) LCA, and problematic cross-linguistically.

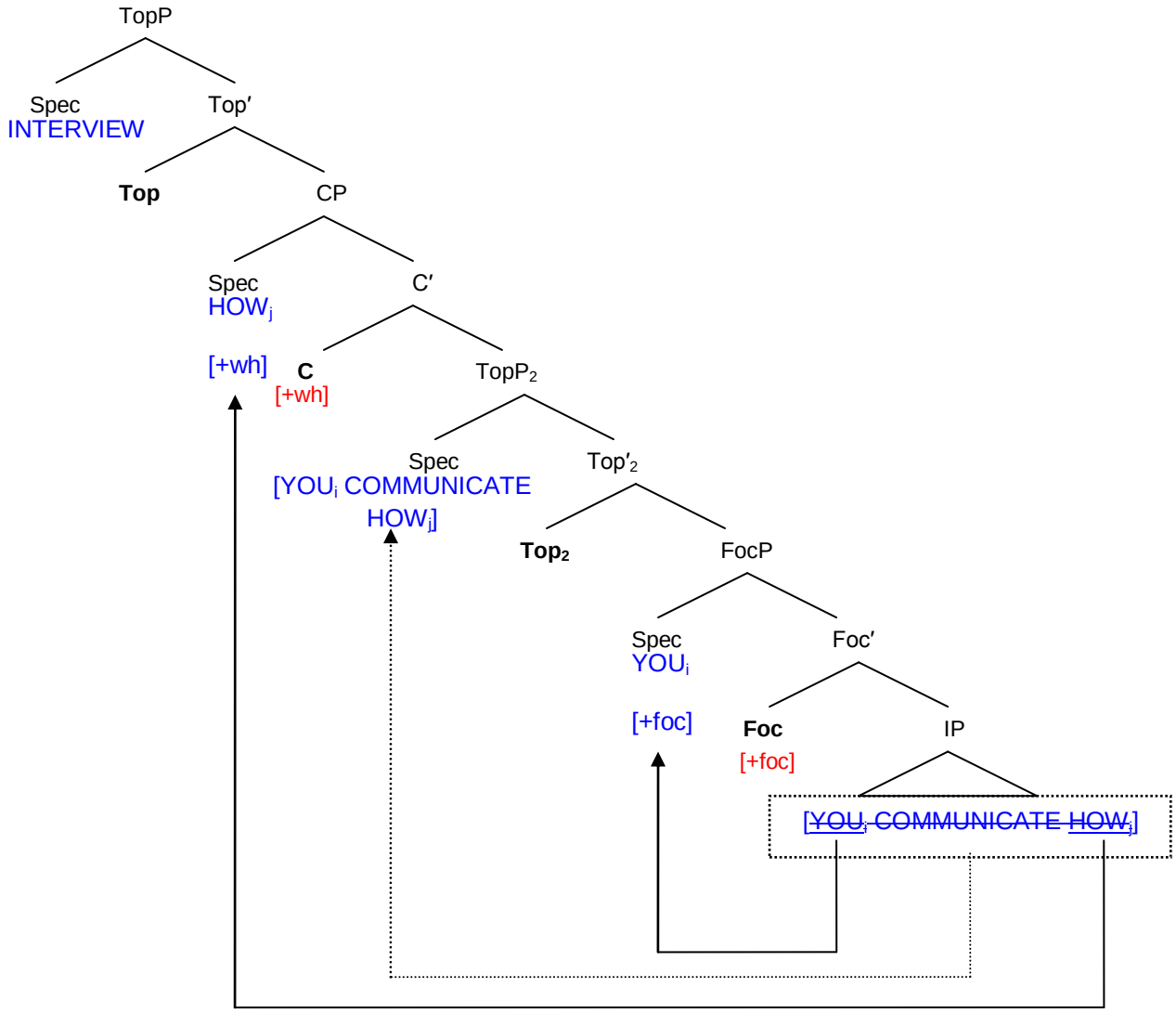
The second proposal concerns instances where the *wh* phrase is an object, or a *wh* phrase whose in situ position is post-verbal. These constructions can have both a double *wh* word, as well as a doubled pronoun occurring to the right of the *wh* word, in a sentence final position. I propose the structure to be as follows, for a sentence such as example (16) (repeated from example (11b)). The [+wh] features in C are checked by the movement of the *wh* subject phrase to [Spec,CP] either overtly or covertly at LF. Whether the *wh* subject phrase moves overtly or covertly would

need to be resolved with more data, showing the distribution of, for example, adverbials in relation to the sentence-initial *wh* phrase and the remainder of the IP.

The second part of this proposal attempts to explain the occurrence of a 'repeated' pronoun to the right of the *wh* word. This is illustrated in Figure (2), using the sentence in example (16).

16) _____t _____wh
INTERVIEW, HOW YOU COMMUNICATE HOW YOU
'As for the interview, how will you communicate?'

Figure (2): *wh* non-subject



In this structure, the pronominal equivalent of the subject (in this case they are both pronouns) copies to the [Spec,FocP] position, checking the [+foc] features in the head of FocP in a Spec-Head relationship. Note that this differs from the structure of doubling *wh* subjects shown in figure (1). This structure accounts for the fact that pronouns referring back to the subject of the main clause appear rightwards of the *wh* word. I propose that the IP moves to a position I have called [Spec,TopP$_2$], and the *wh* word, if appearing also in the sentence initial position, undergoes an overt

copy to [Spec,CP] to check [+wh] features in a Spec-Head relationship. The lower *wh* word, in situ, is not deleted. A sentence like example (7a) repeated below as example (17), where the *wh* word appears to be only in situ, may be explained by analyzing the *wh* word as undergoing movement at LF to check the [+wh] features, but appearing in situ at PF.

17) ____wh
YOUR UNCLE WORK WHAT
'What does your uncle do/ work as?'

These analyses account for the ordering of *wh* elements and doubled pronominals. There are still unresolved questions regarding subject and *wh* copies, as in some circumstances deletion of the higher copy seems to take place. This is shown by example (18) below, where the pronoun appears in sentence final position with no pronoun appearing in a higher position.

18) _____wh
LIVE WHERE YOU
'Where do you live?'

These kinds of sentences could be explained by the pronoun being copied to the [Spec,Foc] position, and once the IP has moved up to a higher position, the copy of the pronoun in this higher position deleted. This is a plausible hypothesis, as the copy of the pronoun which has checked the [+foc] features – the 'best' copy – is not deleted. The analysis provides a starting point, but questions remain about when one copy of the pronoun is deleted, and when both are overtly articulated.

More data would also be needed to ascertain whether there are two types of *wh* movement as shown here, one when the *wh* word is a subject and one when it is an object, or occurs post-verbally in situ. No data were collected which show a pronoun referring to the subject in the sentence final position, along with a copied *wh* subject – which could give an indication that these two things cannot occur together (ie in the focus position). Elicitations of the grammaticality of this construction from native NZSL signers would be helpful.

3.1.1 Distribution of NMM

The distribution of the NMM in NZSL *wh* questions can be explained in accordance with Neidle et al's (2000) claim that NMM spreads over the C-command domain of the node with which it is associated. The [+wh] features are associated with C and also with nodes which contain *wh* words, either moved or in situ.
In previous examples, a seemingly 'optional' spread of *wh* features was apparent. This was shown in example (7), repeated below.

19a) ____wh
YOUR UNCLE WORK WHAT
'What does your uncle do/ work as?'

19b) _____wh
HIS FATHER WORK WHAT

'What does his father do/ work as?'

The difference in the spread of NMM could be analysed as shown in Figures (3) and (4).

Figure (3): Spread of *wh* NMM over *wh* word only

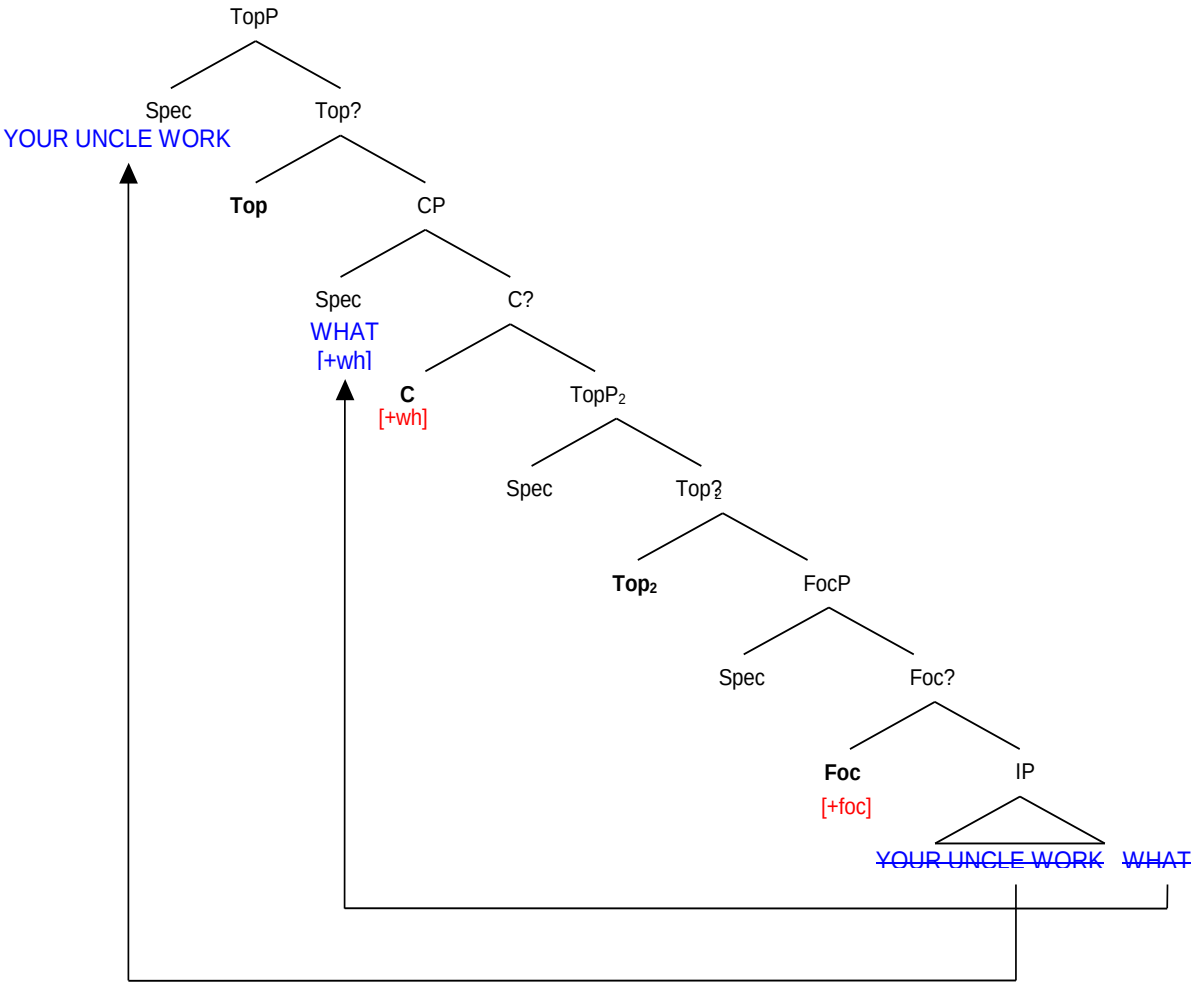
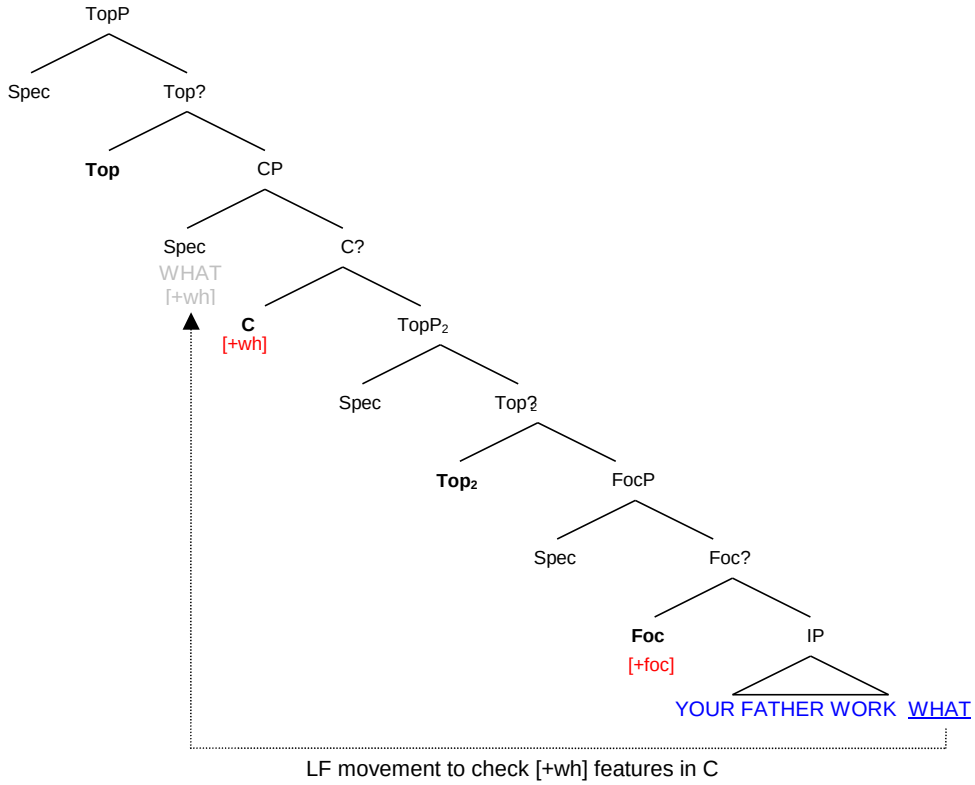


Figure (4): Spread of *wh* NMM over entire clause

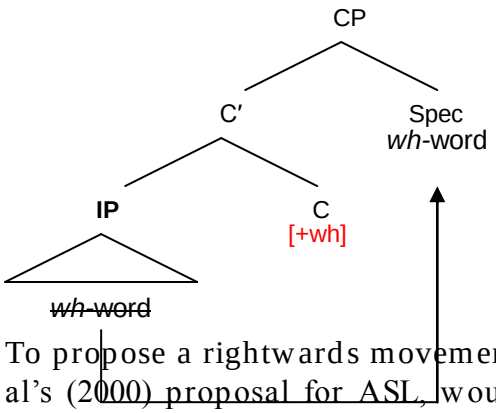


In sentences where the *wh* NMM spreads over the entire clause, the IP is analysed as in situ, with covert movement of the *wh* phrase at LF to check the [+wh] features in C. Under this analysis, the spread of the NMM over the IP is explained by virtue of the IP being within the C-command domain of the [+wh] feature in C.

3.2 Rightwards movement

For ASL *wh* words, which also appear sentence finally, a rightwards movement hypothesis was put forward (see Neidle et al 1998, 2000 and Neidle 2002). This approach posited that the *wh* element, when moved, did so to a Spec position on the right of CP. Neidle et al (2000) maintain that rightwards movement must be allowed for in theories of universal grammar.

Figure (5): Rightwards movement



To propose a rightwards movement of *wh* phrases in NZSL, analogous to Neidle et al's (2000) proposal for ASL, would mean that an additional projection would be

needed above CP, with the head on the right, to house pronouns occurring to the right of the *wh* words (see example 20).

Neidle et al (2000) claim, for ASL, that when a *wh* phrase is moved rightwards to [Spec,CP] the NMM optionally spreads over CP. In NZSL, however, when a pronoun referring to the subject of the main clause appears to the right of the final *wh* word, the *wh* NMM also spreads over the pronoun, as shown in example (20).

20) _____wh
YOU BEFORE WORK WHAT YOU
'What did you do/ work as before?'

If there were to be a projection above CP for the pronoun, so that it appears on the right of the *wh* question, we would not expect the NMM to spread over the final pronoun, as it would not be c-commanded by C, where the [+wh] features are.[4] However, the data clearly shows that NMM spreads beyond the final *wh* word to the sentence final pronoun. Without further analysis, the NZSL data seems to be inconsistent with the claims made for NMM in ASL by Neidle et al (2000).

4. Conclusions

This paper has provided an initial formal syntactic analysis of NZSL *wh* question constructions. It has shown that *wh* words in NZSL can appear in various positions, and that questions may contain two *wh* words corresponding to a single argument. A syntactic analysis of the word order occurring in these questions was presented in section 3.1, which was consistent with Kayne's (1994) proposal that all syntactic movement be leftwards. A rightwards hypothesis, put forward by Neidle et al (2000) to explain the ASL data for rightwards occurring *wh* words was also considered, but the NZSL data was found to be *prima facie* inconsistent with Neidle et al's claim that NMM are manifestations of syntactic features.

There is still much work to be done to explain the syntax of NZSL *wh* questions. Obviously, more data is always an advantage, and judgments of grammaticality or ungrammaticality of various *wh* constructions would be invaluable in producing a broader picture of the syntax of NZSL *wh* questions. Of benefit would be grammaticality judgments on:

- the distribution of the generic *wh* sign
- the distribution of NMM in *wh* questions
- the placement of adverbials in relation to *wh* phrases, and
- the co-occurrence of *wh* subject copies and sentence final pronouns referring to the subject of the main clause

Differences in the semantics of differing *wh* constructions, including issues of focus, presupposition and pragmatics would be extremely helpful in providing a fuller

[4] This approach in inconsistent with Kayne's (1994) LCA, and the linearization of hierarchical structure under the minimalist programme (see Hornstein et al 2005). Having a projection above CP with the head to the right is consistent with Neidle et al's (2000) approach to hierarchical structure.

picture of *wh* questions in ASL, and determining what position in the hierarchical structure *wh* phrases move to (especially with reference to focus positions). If, as I proposed in section 3.1.1, the *wh* subject moves to a focus position, we would expect that the construction entails some element of presupposition. This could be tested with elicitations of acceptability of responses to the questions, for example the answer 'NO-ONE' to the question 'WHO BABYSIT WHO' would be predicted to be unacceptable if the *wh* word is in a focus position, and therefore the fact that *someone* is babysitting is presupposed (based on similar tests in Cheng and Rooryk 2000, and Neidle 2002).

Overall, this study has provided a preliminary syntactic analysis for NZSL *wh* questions, in line with Kayne's (1994) LCA. More focused and detailed research is needed to ascertain whether the claims made in this paper are correct, and to more finely examine the structure of *wh* questions in NZSL.

Appendix: Notation Conventions

SIGN	signs are represented by glosses in capital letters
SIGN-SIGN	single sign represented by more than one English word in the gloss
fsSIGN	sign finger-spelled using the manual alphabet
___nms	a line represents non-manual marking and the extent of its co-articulation with the manual material
____t	non-manual topic marking (primarily raised eyebrows)
___wh	non-manual wh marking (primarily furrowed eyebrows)
(___)	optional spread of NMM

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Double Realization of Verbs in Argentinian Spanish

Raquel Direnzo

Abstract

This paper explores a construction in Argentinian Spanish (AS) in which there is a double phonetic realization of verbs in sentences expressing emphatic affirmation. In a recent study, Martins (2007) has proposed that European Portuguese (EP) also has a construction in which verb reduplication occurs because this language has both verb movement to Σ [+ aff], and verb movement to C [+emph]. However, Martins says that this construction does not exist in Spanish, since it does not have verb movement to Σ. Through the exploration and contrasting of EP and AS, we show the occurrence of double realization of focalized verbs in AS, as a verb initial construction, derived with verb movement to Σ and then to C, followed by morphological reanalysis of C.

1. Introduction

The aim of this study is the examination of a construction in Argentinian Spanish (AS) in which there is a double phonetic realization of verbs in sentences expressing emphatic affirmation (see (1) below). This construction is a non-standard although rather usual way of speaking in lower socio-economic classes, amongst people whose education does not go beyond primary school. Although this construction is not part of my dialect, I have, as a native speaker of Argentine Spanish, observed it, and I feel I have some intuitions about it and I intend to study its context as well as the way it is used. A typical example of the double realization of verbs is:

1) *Estudia historia estudia.*
studies history studies
'He/ she studies history'

In a recent discussion, Martins (2007) shows that European Portuguese (EP) also has a construction in which double realization of verbal copies occurs. EP has sentences that express emphatic affirmation, that are either elliptic structures produced as replies to a yes/ no question presupposing a negative answer, or full declaratives which contradict a preceding negative statement. Martins proposes in her paper that the sentences with verb reduplication found in EP are available in this language because it has both verb movement to Σ [+ aff], where aff/ neg features are located, and verb movement to C [+emph], where emphatic features are located. However, Martins claims that verb reduplication does not exist in Spanish and that the absence is not unexpected because, as it follows from her proposal, since Spanish does not have verb movement to Σ, then it cannot express emphatic affirmation by means of verb reduplication as EP does. So either Spanish is not parallel syntactically with EP or Martins is not correct.

Here I would like to draw attention to the fact that no general study of emphatic verb reduplication can disregard the AS evidence. Consequently this study puts forward evidence to describe the constructions. It also compares EP with AS reduplication to analyse if this structure works in the same way in both languages. Further, this study considers a range of problematical cases to identify the function of reduplication, its motivations, and whether it contributes to the meaning of the utterance. This research mainly uses data from AS to dispute Martins' (2007) claim as well as a small sample of written text from Uruguay and Chile.

2. Verb reduplication in European Portuguese

2.1 Emphatic affirmative answers to yes/ no questions that contradict a negative presupposition

According to Martins (2007) these types of sentences appear in the context of a tag question presupposing a negative answer. She gives the following examples:

2a) *O João não comprou o carro, pois não?*
the Joao NEG bought the car, pois (confirmative word) NEG
'John didn't buy the car, did he?'

2b) *Comprou, comprou.*
bought bought
'Yes, he DID'
(Martins 2007:81)

2.2 Emphatic affirmative declaratives that contradict a negative statement

Martins considers that these answers assert the untruth of a preceding negative statement.

3a) *O João não comprou o carro.*
the Joao NEG bought the car
'John didn't buy the car'

3b) *O João comprou o carro, comprou.*
the Joao bought the car bought
'John did buy the car'
(Martins 2007:81)

3. Verb reduplication in Spanish

Martins (2007) says that no such grammatical construction happens in Spanish and that the absence of verb reduplication in this language is not unexpected because Spanish does not have verb movement to Σ, and therefore cannot express emphatic affirmation by means of verb reduplication as EP does. In order to express emphatic affirmation, Spanish displays the *sí (que) ('AFF-that') strategy*, which parallels EP verb reduplication. Martins (2004) analyses this strategy, considering the affirmative

word *sí* as a polarity head. The affirmative *sí que* merges with Σ, thus satisfying its visibility requirement. The head Σ incorporating *sí* moves then to C, which encodes emphatic features and has the option of being phonologically null or phonologically realized. The two examples below show this strategy with a null and an overt complementizer respectively.

4a) *Juan sí fue a Roma.*
John AFF went to Rome
'John did go to Rome'

4b) *Juan sí que fue a Roma.*
John AFF that went to Rome
'John did go to Rome'

A parallel argument is made by Laka (1990:251). She shows two examples that illustrate co-occurrence of *sí* and subjunctive in embedded sentences, where the inflected verb is emphasized by means of *sí*:

5) *Espero que sí lo traigas.*
hope-I that yes it-bringSUBJyou
'I hope that you will bring it'

6) *Me pidió que sí fuera.*
me-asked that yes goSUBJ
'She asked me to go'

It seems to me that when verb reduplication occurs, as is shown in the following examples, the emphatic affirmation of the sentence is again due to the movement of the verb to Σ and C followed by morphological reanalysis of C, and not because of the occurrence of *sí*. Furthermore, the semantics of the sentence is the same as if the affirmative *sí* did not occur. Subsequently, in my view, these kinds of constructions are not usually the target for verb reduplication (see (7) and (8) below).

7) *?Espero que (sí) lo traigas, espero.*
hope-I that yes it-bringSUBJyou hope-I
'I hope that you will bring it'

8) *?Me pidió que (sí) fuera, me pidió.*
me-asked that yes goSUBJ me-asked
'She asked me to go'

4. Verb reduplication in Argentinian Spanish

4.1 Initial data

This study goes beyond Martins' analysis of Spanish sentences, in order to account for the possibility of the verbal repetition construction in AS. I will closely examine the contexts in which this feature can occur to explain the role it plays in Spanish. For this purpose, a presentation of the relevant data is followed by a discussion and

analysis where both differences and similarities between EP and AS contribute toward the clarification of the research.
This research uses mainly data from AS plus a small sample of written text from Uruguay and Chile to dispute Martins' (2007) claim. These sources are from my experience as a native speaker, from other people whom I have observed, and also from grammar and story books. Although the list of data is not exhaustive, I think it gives a good indication of the topic.

Emphatic affirmation can be syntactically expressed through verb reduplication in AS declarative sentences, as example (9) below shows. An emphatic affirmative answer to a question that requires a complete answer (not yes/ no questions) is shown in example (10b) below. In contrast, the different answers to the yes/ no question: *¿Están en el parque?* in example (11) below, display a different picture. Examples (11a and b) show how a yes/ no question is answered by the 'sí que' strategy, with a null complementizer in the former and an overt one in the latter (as illustrated in section 3 above). Example (11c) shows that verb reduplication does not occur in answering a yes/ no question. In example (11d) we can see that a bare verb affirmative answer to yes/ no questions is disallowed in AS. The bare verb and its copy are also disallowed, as illustrated in (11e) below.

9) *Están todos en el parque están.*
are everybody in the park are
'Everybody is in the park'

10a) *¿Dónde están?*
where are
'Where are they?'

10b) *Están en el parque están.*
are in the park are
'They are in the park'

11) *¿Están en el parque?*
are in the park
'Are they in the park?'

11a) *Sí, están.*
yes are
'Yes, they are'

11b) *Sí que están.*
yes that are
'Yes, they are'

11c) **Están en el parque están.*
are in the park are
'They are in the park'

11d) ***Están**.
are
'They are'

11e) ***Están están**.
are are
'They are'

A parallel argument is made by Vicente (2009). He claims that a predicate cleft in Spanish consists of an infinitive (the topic) sitting in a left peripheral topic position and doubled by a fully inflected version of the same verb (the tail) sitting in a clause internal position. He also says that it is not possible for a topic to surface as a finite verb – See (12a and b) below. In addition, Vicente notes that predicate clefts typically have a verum focus reading, asserting the truth of the proposition which is realized by assigning focal stress to some constituent within the main part of the clause, typically the inflected verb. This author explains the syntax implementation of this hypothesis as a case of movement that targets the vP level and requires head-to-spec movement; that is, a bare head can move to the inner specifier position of the closest head up; and with regard to phrase movement is a case of pied-pipping. (See (12c) below.)

12a) *Leer, Juan ha leído un libro.*
read.INF Juan has read a book
'As for reading, Juan has read a book.'
(Vicente 2009:159)

12b) *Leído, Juan ha leído un libro.*
read Juan has read a book
'As for reading, Juan has read a book.'
(Vicente 2009:159)

12c) *Leer el libro, Juan lo ha leído.*
read.INF the book Juan CL has read
'As for reading, Juan has read it.'
(Vicente 2009:184)

Vicente (2009:160) shows the following structure for (12a):

[TopP[[V°][Top'[Top°][TP[T°][VP[Spec][V'[ti][VP[V][XP]]]]]]]]

As we have seen in Vicente's (2009) analysis above, this grammar construction has an emphatic syntactic construction in standard Spanish, which reduplicates the verb as in EP and AS. However, while both copies of the verb are always inflected in these languages, Vicente shows a construction where the verb is a topicalized infinitive, and this, if applied to EP and AS constructions, would be completely ungrammatical, and become an unacceptable string of words.

It is important to mention that verb reduplication also occurs in the context of negative sentences in AS; part K of section 4.2 below provides examples from AS, as

well as a comparison with EP, where verb reduplication is ungrammatical in this kind of construction.

4.2 Comparing EP and AS

By comparing EP and AS, we can see the different constructions that show the use of emphatic verb reduplication. This will help us to describe the syntactic account of the construction in AS.

4.2.1 Copular verbs

Martins (2007) shows in example (13) below a copular verb *é* 'be' that is reduplicated in EP. Similarly, in AS *ser* 'be' is a verb that links one entity with another or an entity with a characteristic and in both cases verb reduplication occurs as is shown in example (14a and b) respectively.

13) *Dormir 8 horas é saudável, é.*
sleep-INF 8 hours is healthy is
'Of course to sleep 8 hours is healthy'
(Martins 2007:81)

14a) *Es la mucama es.*
is the maid is
'She is the maid'

14b) *Es inteligente es.*
is intelligent is
'He/ she is intelligent'

4.2.2 Ditransitive verb

In example (15) below Martins shows a ditransitive verb *dar* 'give', that can be reduplicated in AS. This verb denotes an action that entails not only an object but also a recipient, the indirect object; the dative is marked by the 'personal a'. The relative order of object and dative is free. However, any dative precedes an object consisting of an embedded clause as shown in the following example (16b) with the ditransitive verb *pedir* 'ask for'. Regarding the position of the object clitics, when reducing a nominal object, the resulting clitic is adjoined to the predicate, whether these precede or follow the verb. It becomes proclitic to the verbal as example (16c) illustrates. However, in imperative clauses, the adjoined clitic object is moved to the front and becomes enclitic rather than proclitic to the verb head. When, on the other hand, an imperative clause is negated, it is proclitic; and the negation appears in both copies, as illustrated in (16e) below. Finally, in the case of co-occurrent clitics in the same predicate, examples (16f and g) show the simultaneous reduction of both an object and a dative but also with no reduction of the dative as in (16h).

15) *Eu dei ontem esse livro ao João, dei.*
I gave yesterday this book to John gave
'I did give John this book yesterday'
(Martins 2007:81)

16a) *Darle la tarea a Juan darle.*
give-to him the homework to John give-to him
'Give the homework to John'

16b) *Pedirles a los hijos que se comporten pedirles.*
ask for-to them to the children that themselves behave ask for-to them
'Ask the children to behave'

16c) *No la tenemos más no la tenemos.*
NEG it have anymore NEG it have
'We do not have it anymore'

16d) *Tráelas a las cinco tráelas.*
bring-them at the five bring-them
'Bring them at five'

16e) *No las traigas a las cinco no las traigas.*
no them bring at the five no them-bring
'Do not bring them at five'

16f) *Le dimos la carne al perro le dimos.*
to-it gave the meat to-the dog to-it gave
'We gave the meat to the dog'

16g) *Se la dimos ayer se la dimos.*
ourselves it gave yesterday to-her it gave
'We gave it to her yesterday'

16h) *Se la dimos ayer al perro se la dimos.*
ourselves it gave yesterday to-the dog ourselves it gave
'We gave it to the dog yesterday'

4.2.3 Unaccusative verb

Martins (2007) uses an example of an unaccusative verb *chegar* 'arrive'. (See (17) below.) This verb *llegar* 'to arrive' allows this kind of construction in AS but the verb is reduplicated before the subject as example (18) shows:

17) *O mau-tempo chegou (cá), chegou.*
the bad-weather arrived here arrived
'The bad weather did arrive'
(Martins 2007:81)

18) *Llegó el mal tiempo llegó.*
arrived the bad weather arrived
'The bad weather did arrive'

4.2.4 Unergative verb

An unergative verb (*sorrir* 'smile') is shown in (19). As in example (18), *sonreir* 'smile' is reduplicated before the subject in AS (example (20) below). We can also find in AS examples such as (21).

19) *Tu sorriste, sorriste.*
you smiled smiled
'You did smile'
(Martins 2007:81)

20) *Sonreíste tú sonreíste.*
smiled you smiled
'You did smile'

21) *Le sonrió al chico le sonrió.*
to him smiled to-the boy to him smiled
'He/ she smiled to the boy'

4.2.5 Non-restructuring control verb

In example (22) below a non-restructuring control verb (*ousar* 'dare') from EP is shown. This verb can be translated into Spanish either as *osar* or as *atreverse*; both can be reduplicated in AS sentences. Here *atreverse* is a reflexive verb; its duplicate also contains a pronoun. The following examples (23) and (24) illustrate this.

22) *Ela ousou beijar-te, ousou.*
she dared kiss-INF-you dared
'She did dare to kiss you'
(Martins 2007:81)

23) *Osó besarte osó.*
she dared kiss-INF-you dared
'She dared to kiss you'

24) *Se atrevió a besarte se atrevió.*
herself dared to kiss-INF-you herself dared
'She dared to kiss you'

4.2.6 Existential verb

Martins (2007) shows an existential verb (*haver* 'there is/ are') in the following example (25).

25) *Há demasiadas pessoas nesta sala, há.*
is too many people in-this room is
'Of course there are too many people in this room'
(Martins 2007:81)

This kind of reduplication also occurs in the same way in AS:

26) *Hay demasiadas personas en esta sala hay.*
there is too many people in this room there is
'there are too many people in this room'

Hay also occurs in AS in the impersonal expression *hay que* 'have to'+ *infinitive verb* which suggests a strong necessity or indicates that something is needed. *'hay'* is a form of verb *haber* (to have), and in this kind of impersonal sentence it is always used in the third person singular. Example (26) shows that verb reduplication occurs by doubling only *hay* instead of *hay que*. See also example (27) below.

27) *Hay que mirar menos tele hay (*que).*
have to watchINF less TV have
'One must watch less TV'

4.2.7 Matrix and embedded verbs

In complex sentences the matrix verb can display reduplication, while the embedded verb cannot. Also emphatic verb reduplication is restricted to root domains in these kinds of structures, as is shown in the following examples:

28a) *Não sei se ele vem á festa.*
NEG know-1SG whether he comes to-the party
'I don't know whether he is coming to the party'

28b) *Sabes se/ qu ele vem á festa, sabes.*
know-2SG whether/ that he comes to-the party know-2SG
'You do know whether/ that he is coming to the party'

28c) **Sabes que ele vem á festa, vem.*
know-2SG that he comes to-the party comes
'You know that he WILL come to the party'
(Martins 2007:90)

In AS:

29a) *Imagino que ellos llegarán temprano imagino.*
imagine that they will arrive early imagine
'I imagine that they will arrive early'

29b) **Imagino que ellos llegarán temprano llegarán.*
imagine that they will arrive early will arrive
'I imagine that they will arrive early'

30a) *Ele não ouve bem.*
he NEG hears well
'He doesn't hear well'

30b) *Ele ouve bem, ouve.*
he hears well hears
'He does hear well'

30c) **Eu sei que ele ouve bem, ouve.*
I know that he hears well hears
'I know that he does hear well'

(Martins 2007:89)

In AS:

31a) *Comen mucho comen.*
eat much eat
'They eat a lot'

31b) **Creemos que comen mucho creemos.*
believe that eat much believe
'We believe that they eat a lot'

4.2.8 Finite and non-finite verbs

In emphatic verb reduplication structures, only the finite verb can surface twice. Both the reduplication of the entire verbal sequence and the reduplication of the non-finite verb lead to ungrammaticality:

32a) *Eu não estava cantando.*
I NEG was singing
'I wasn't singing'

32b) *Tu estavas cantando, estavas.*
you were singing were
'Of course you were singing'

32c) **Tu estavas cantando, estavas cantando.*
you were singing were singing
'Of course you were singing'

32d) **Tu estavas cantando, cantando.*
you were singing singing
'Of course you were singing'
(Martins 2007:88)

33a) *Ele não pode sair de casa.*
he NEG can leave-INF of house
'He can't go out'

33b) *Ele pode sair de casa, pode.*
he can leave-INF of house can
'Of course he can go out'

33c) **Ele pode sair de casa, pode sair.*
he can leave of house can leave
'Of course he can go out'

33d) **Ele pode sair de casa, sair.*
he can leave-INF of house leave-INF
'Of course he can go out'

(Martins 2007:89)

Reduplication occurs in the same way in Spanish:

34a) *Estaban jugando estaban.*
were playing were
'They were playing'

34b) **Estaban jugando estaban jugando.*
were playing were playing
'They were playing'

34c) **Estaban jugando jugando.*
were playing playing
'They were playing'

4.2.9 Adverbs

Martins (2007) states that preverbal adverbs are compatible with emphatic verb reduplication (see 35b and 36b) while phrasal adverbs cannot be reduplicated in order to convey emphatic disagreement (see 35c and 36c).

35a) *O João nem sempre apoiou a Maria.*
the Joao NEG always supported to Mary
'John hasn't always supported Mary'

35b) *O João sempre apoiou a Maria, apoiou.*
the Joao always supported to Mary supported
'Of course John has always supported Mary'

35c) **O João sempre apoiou a Maria, sempre.*
the Joao always supported to Mary always
'Of course John has always supported Mary'
(Martins 2007:91)

36a) *O João não perdeu logo a paciência com a Maria.*
the Joao not lost shortly the patience with the Mary
'John didn't soon lose his patience with Mary'

36b) *O João cedo perdeu a paciência com a Maria, perdeu.*
the Joao early lost the patience with the Mary lost
'John did soon lose his patience with Mary'

36c) **O João cedo perdeu a paciência com a Maria, cedo.*
the Joao early lost the patience with the Mary early
'John did soon lose his patience with Mary'
(Martins 2007:91)

In AS, the reduplication of *apoyó* 'supported' is accurate in the following example (37a); but it also works in (37b) where the adverb *siempre* 'always' is in a different place, which seems not to be a problem for the double phonetic realization.

Examples (37c and d) show the use of an evaluative quantifier *casi* 'almost' and a superlative quantifier phrase, both of which can precede the adverb; although in (37e), adding the indirect object, verb reduplication does not occur so naturally as in (37f).

37a) *Siempre apoya a María apoya.*
always support to Mary support
'He always supports Mary'

37b) *Apoya siempre a María apoya.*
support always to Mary support
'He always supports Mary'

37c) *Apoya casi siempre a María apoya.*
support almost always to Mary support
'He almost always supports Mary'

37d) *Apoya lo más claramente posible apoya.*
support the most clearly possible support
'He supports in the most obvious way'

37e) *Apoya a María lo más claramente posible apoya.*
support to Mary the most clearly possible support
'He supports Mary in the most obvious way'

37f) *Apoya a María apoya lo más claramente posible.*
support to Mary support the most clearly possible
'He supports Mary in the most obvious way'

4.2.10 Clitics

Martins (2007:109) claims that in EP the presence of a single clitic or a clitic cluster in emphatic sentences with verb reduplication makes the sentences ungrammatical. The examples below from Martins support this.

38) *Não le trouxeste o livro que ele te pediu.*
NEG him brought the book that he you-DAT asked
'You didn't bring him the book that he asked you for'

39) *Eu trouxe-lhe o livro que ele me pediu, trouxe.*
I brought-him the book that he me asked brought
'I brought him the book that he asked me for'

40) **Eu trouxe-lhe o livro que ele me pediu, trouxe-lhe.*
I brought-him the book that he me asked brought-him
'Yes, I did bring him the book'

(Martins 2007:110)

Contrarily, in AS, verb reduplication is possible although subject to some constraints. In the example below (41), verb reduplication occurs if both the indirect object and the clitic are overt in the sentence; then, the clitic is not independently doubled, but is doubled as part of the constituent that includes both the clitic pronoun and the verb.

41) *Te presentaron a ti, te presentaron.*
to-you introduced to you to-you introduced
'They introduced you'

Reduplication occurs with two datives of interest, as is illustrated in (42) and (43b). In the latter, the reflexive pronoun precedes the non-reflexive.

42) *Me le arregló el saco a mi padre me le arregló.*
to-me to-him/ her fixed the coat to my father to-me to-him fixed
'He/ she mended my father's coat for me'.

43a) *Me fui temprano me fui.*
myself left early myself left
'I left early'

43b) *Me le fui temprano me le fui.*
myself to-him left early myself to-him left
'I left early to (see) him'

In the following examples (44a and b) the clitics *me* and *lo* are attached to the verb *pintando,* and only the higher verb *podía* is reduplicated. In (44c) both clitics have moved up to *seguir* and again only the higher verb *podía* is reduplicated. And in (44d) they are attached to *podía*; that is, clitics have moved up to the higher verb and the reduplicated verb contains also both clitics. This occurrence sounds less natural to me although it seems to be still grammatically correct.

44a) *Podía seguir pintándolo, podía.*
could continue painting-it could
'He/ she could continue painting it'

44b) *Podía seguir pintándomelo podía.*
could continue painting-to me-it could
'He/ she could continue painting it for me'

44c) *Podía seguírmelo pintando podía.*
could continue-to me-it painting could
'He/ she could continue painting it for me'

44d) ?*Me lo podía seguir pintando, me lo podía.*
to-me it could continue painting me it could
'He/ she could continue painting it for me'

Clitic pronouns are placed before conjugated verbs (see 45a) below. However, they can also be attached to the end of an infinitive (see 45b) below.

45a) *Quiero tenerlo.*
want have-it
'I want to have it'

45b) *Lo quiero tener.*
it want have
'I want to have it'

In Spanish, many verbs require the use of indirect object pronouns to express how a person feels about something or the reaction that something causes in a person. Such cases include the verb *gustar* (to please), *apetecer* (to be appetizing), *caer bien* (to make a good impression), *encantar* (to delight), *importar* (to matter) and *interesar* (to be interesting).

In example (46) below the indirect object pronoun *me* is placed before the conjugated verb, and it also occurs before the reduplicated verb.

46) *Me encanta el rugby me encanta.*
to-me delight a lot the rugby to-me delight a lot
'Rugby delights me a lot'

In (47) below, *a mí* (to me), the indirect object pronoun used for emphasis or contrast, which reinforces the idea of who it is the chocolate pleases, occurs before the higher copy, but is not repeated before the lower one. The adverb is not repeated either.

47) *A mí me gusta (mucho) comer verduras me gusta.*
to-me to-me please (very much) eat vegetables to me please
'Eating vegetables pleases me very much'

4.2.11 Negation

Martins (2007) claims that verbal reduplication in EP is incompatible with negation and that negative sentences with reduplication of the verb by itself or associated with the predicative negation marker are ungrammatical (see (48a and b) below). The former case applies also in AS (see (49a) below); however the latter is allowed in this dialect (see 49b below).

48a) **O João não ganhou a lotaria, ganhou.*
the Joao NEG won the lottery won
'John did not win the lottery'

48b) **O João não ganhou a lotaria, não ganhou.*
the Joao NEG won the lottery NEG won
'John did not win the lottery'
(Martins 2007:85)

49a) **No conduce en la ruta conduce.*

no drive in the motorway drive
'He does not drive on the motorway'

49b) *No conduce en la ruta no conduce.*
no drive in the motorway not drive
'He does not drive on the motorway'

Laka (1990:124) shows that, in Spanish, adverbs must occur after the preverbal n-word and the inflected verb. She claims that n-words move to the Spec of ΣP, and that this ΣP is generated above IP in Spanish. Thus when n-words occur preverbally, it is to the specifier of the Σ phrase that n-words move to when preposed.

Following this argument, example (50a) below shows how reduplication cannot occur when the adverb *habitualmente* intervenes after both the n-word *nadie* and the inflected verb. Example (50b) shows the form of the same sentence without the reduplication, so we can see how it works with presence/ absence of *no*. Example (50c), on the other hand, shows that, where the adverb *habitualmente* intervenes after both the negation and the inflected verb, reduplication can occur despite the presence of the adverb. Examples (50d and e) show cases of ungrammatical sentences where the former does not reduplicate the n-word *nadie* and the latter does not reduplicate *no*. In example (d) *nadie* is in a preverbal position in the sentence and verb reduplication does not occur. However, if *no* precedes the verb and it is followed by *nadie*, verb reduplication occurs, as is shown in examples (50f and g) below; although negative indefinites preclude predicate negation when they precede the verb, predicate negation is required when they follow the verb. When the n-word *nadie* is after the verb and *no* does not occur, the sentence is ungrammatical in the same way as if the sentence includes double realization of the verb (see example (50h) below). Similarly, in (50i) below if the sentence including verb reduplication does not include the negation, the sentence is also ungrammatical.

50a) **Nadie conduce habitualmente en la ruta nadie conduce.*
Nobody drive usually in the motorway nobody drive
'Usually nobody drives on the motorway'

50b) *Nadie conduce habitualmente en la ruta.*
Nobody drive usually in the motorway
'Usually nobody drives on the motorway'

50c) *No conduce habitualmente en la ruta no conduce.*
No drive usually in the motorway not drive
'Usually nobody drives on the motorway'

50d) **Nadie conduce habitualmente en la ruta, conduce.*
Nobody drive usually in the motorway drive
'Usually nobody drives on the motorway'

50e) **Nadie conduce habitualmente en la ruta, no conduce.*
Nobody drive usually in the motorway no drive

'Usually nobody drives on the motorway'

50f) *No conduce nadie en la ruta no conduce.*
No drive nobody in the motorway no drive
'Nobody drives on the motorway'

50g) *No conduce nadie habitualmente en la ruta no conduce.*
No drive nobody usually in the motorway no drive
'Usually nobody drives on the motorway'

50h) **Conduce nadie conduce.*
drive nobody drive
'Nobody drives'

50i) **Conduce nadie no conduce.*
drive nobody no drive
'Nobody drives'

We can see that the functional head Neg is located above Tense in Spanish. According to Laka (1990:99) natural languages do not have a separate syntactic category for negation, it belongs to a more abstract category called Σ (and one other element of this category is emphatic affirmation). This author claims that n-words in Spanish are Polarity items and when they occur preverbally they move to the specifier of a ΣP,[1] generated above IP. Furthermore, when preverbal subjects occupy ΣP, they are interpreted as unmarked topics.

This section has examined a small sampling of constructions from EP and AS. We have been exploring a set of facts from grammar, showing some aspects where EP and AS are paralleled in syntax. They include the verbal reduplication of emphatic affirmative sentences, the occurrence of verb reduplication with a ditransitive verb, an unaccusative verb, an unergative verb, a restructuring and a non-restructuring control verb, an existential verb and a copular verb. We have examined the placement of adverbs and also negative sentences and sentences containing clitics, which are ungrammatical with verb reduplication in EP while they are well formed in AS. A further discussion to be considered at this point is how to express the syntactic encoding for these constructions. This will be analyzed in section 4.4.

4.3 Distinction between mono-sentential verb reduplication and bi-sentential reiterative repetition

Martins (2007) claims that the kind of emphatic affirmative sentences described in her article are not bi-sentential structures; that is, instances of sentence repetition. Sentence repetition implies a prosodic break separating the two sentences and a falling intonation at the end of each sentence. She argues that in her sentences there is no prosodic break and the sequences are associated with an overall rising intonation.

[1] Laka (1990) claims that ΣP placement is crosslinguistically variable.

Similarly we can analyse double phonetic realization of verbs in sentences in AS to see if we can arrive at the same conclusion.

Let's suppose that the repeated verb is actually a new sentence of the sequence; then, according to the rules of Spanish phonology, in any possible case we should apply the rule that a second sentence begins. Nevertheless this is not the case since there are several examples in which this rule does not apply. For example, / b d g / are pronounced two slightly different ways, depending on the phonetic context: [b d g] are stop, occlusive consonants while [β δ γ] are fricative, spirant ones.

4.3.1 <b> and <v>

<b> and <v> are pronounced the same way in Spanish. The sounds they represent follow a particular pattern. They are pronounced with a [b] at the beginning of a sentence, after a pause, and after the consonants / m/ , / n/ and / l/ .

[b]*iología* [b]*einte hom*[b]*re el*[b]*icio*

Everywhere else, and especially after a vowel, / b/ and / v/ are pronounced as a [β]. The sound is formed by pressing the lower lip toward the upper lip, but allowing air to pass through.

la[β]*iología y*[β]*einte muy*[β]*ien tra*[β]*ajar* [b]*erde* [β]*iento* [b]*erdes ramas*

In the following example (51a) the / v/ after *Marcia* is pronounced as [β], and so the last *viene* is part of the same sentence. However in example (51b) below, the / v/ after the / l/ of Manuel as well as the / v/ of *viene* at the beginning of the sentence, are realized as [b], i.e. the occurrence of just one sentence cannot be proved.

51a) [b]*iene Marcia*[β]*iene*

51b) [b]*iene Manuel* [b]*iene*

A parallel argument can be made for the syncretism rule regarding the consonant / n/ . For most speakers in Spanish, the phoneme / n/ has the allophone [m] before a bilabial consonant, as it is shown in the next examples:

52a) *un dedo*

but

52b) *um peso*

Then in the example (53) below, the / n/ of *viajan* and the / n/ of *bien*, both in coda positions, become [m], before / b/ of *bien* and / v/ of *viajan*. Consequently this example shows emphatic verb reduplication instead of a sentence repetition.

53) *viaja*[*m*] *bie*[*m*] *viajan*

The pronunciation of the consonants / d/ and / g/ follows the same pattern as / b/ and / v/ .

4.3.2 <d>

[d] is used at the beginning of sentences, after a pause, and after / n/ or / l/ (*dog*). [ð] occurs everywhere else, especially between vowels (*father*) (see (54 a and b) below).

54a) ¿[d]*ónde?* ¿[d]e[ð]*ónde?*

54b) [d]*os. ¿Hay*[ð]*os?*

In the following example (55), / d/ in *dejalo* is allocated in between two vowels (*o* and *e*) and so it is pronounced as [ð]. Hence it follows that the example represents a monolingual sentence.

55) [d]*ejalo solo*[ð]*ejalo*

Example (56) similarly shows a sentence without prosodic break.

56) [d]*obla a la*[ð]*erecha*[ð]*obla*

4.3.3 <g>

/ g/ is pronounced similarly to the English *go* at the beginning of an utterance, after a pause, and after / n/ . The realization of / g/ as [ɣ], with no equivalent in English, occurs everywhere else. It is formed much like [g] but the tongue does not quite touch the back part of the roof of the mouth, so the flow of air is not stopped. Examples (57 a and b) show that.

57a) [g]*ato. Dos*[ɣ]*atos.*

57b) [g]*onzález. Pa*[ɣ]*ar.*

Example (58) below cannot demonstrate the contrast between bi-sentential and mono-sentential structures, since the first letter of the reduplicated verb *ganó* is realized as [g] as it is following / n/ .

58) [g]*anó Juan* [g]*anó*

By contrast, in (59), *gasta* is in between two vowels and so its phonetic pronunciation is as [ɣ] and there is no doubt about the existence of just one sentence; should a prosodic break intervene, its realization would be hard.

59) [g]asta poco[ɣ]asta

In a similar manner, we can see that the sound of / b/ , / d/ and / *g*/ between vowels within a word and at the ends of words has been taken to such extreme by some speakers that the consonants are imperceptible or deleted; for instance, *nada* pronounced as *na and verdad* pronounced as *verdá.* The following example (60) illustrates the point, where *verdá* lacks the coda / d/ between the vowels / a/ and / e/ , showing that only one sentence occurs.

60) *era verdá era*

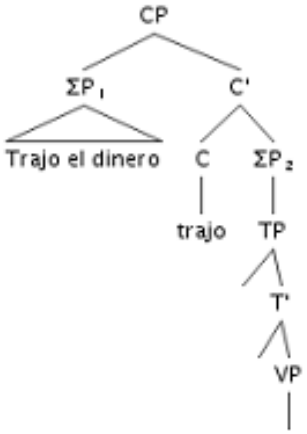
In sum, by means of the very similar ways in which / b/ , / d/ and / g/ occur in the sentence, we can see double realization of verbal copies as a different structure from bi-sentential ones, in AS, as well as in EP.

It seems to me that this feature implies an overall rising intonation in AS in the same way as in EP. AS uses this construction to emphasise the verb and in this sense, the whole sentence has to be emphasised, not just one verb, as a way of expressing the message in a more emphatic manner.

4.4 Syntactic encoding

In order to describe the syntactic encoding of this construction in AS, we can follow Martins' (2007) analysis,[2] and state that emphatic declaratives and emphatic answers in AS activate the domains of Σ and C. The clausal constituent is a Topic in the CP space. Sentences are derived with movement of V-to-T-to-Σ-to-C, followed by movement of the remnant ΣP to the Spec CP. Morphological reanalysis in C allows the double phonetic realization of the verb. Martins (2004) notes that, "if morphological reanalysis had not taken place, the verbal copy in Σ would be deleted (as it is C-commanded by the verbal copy in C)".

61) [CP [ΣP Trajo el dinero] [C' [C trajo] [ΣP trajo [TP [T'trajo [VP trajo el dinero]]]]]]



In a similar manner, we can observe this construction according to Rizzi (1997:281), where he states that the complementizer layer in the structural representation of a clause can host topics and focalized elements. Rizzi argues that the clausal constituent is a Topic in CP; it rises to Spec Top P, in order to leave in final position the Foc° head that expresses polarity focus (the main verb is moving to check a focus feature).

Laka (cited in Rizzi 1997:286) claims that Spanish seems to have a focus construction similar to the Italian one. According to Rizzi "the focus-presupposition articulation can be expressed in Italian by preposing the focal element (focalization) and

[2] Martin's analysis relies on Nunes's (2001, 2004) idea that the phonetic realization of multiple links of a chain is permitted as far as linearization, as application of Kayne's (1994) Linear Correspondence Axiom (LCA), can still operate.

assigning it special focal stress".[3] The author limits this option to constructive focus and explains that in a Foc° P, its specifier is the focus and the presupposition is its complement. He claims that the Focus movement must be triggered by the satisfaction of feature checking. Subsequently the fusion of the focus with the verb ensure the phonetic realization of an additional chain link; and throughout this, two lexical items occur in the output.

Hornstein et al (2006:244) describe verb focalization in Vata, where a focalized verb is doubled by an identical verb in the regular position occupied by verbs.[4] Koopman (cited in Hornstein et al 2006:170) has argued that "a focused verb in Vata moves to C°, leaving behind a copy". Hornstein et al (2006) analyze Vata assuming that focalization involves movement of the verb to a focus position preceding TP. Then, supposing that the verb and the focus head get morphologically fused in the phonological component, Hornstein et al (2006) assume that linearization follows morphological computations, so that the topmost copy of the verb will become invisible to the Linear Correspondence Axiom (LCA) after the morphological reanalysis.[5] That is, the LCA will consider just the two lower copies and given that the copy adjoined to T° is the one with more features checked, it will be retained and the lowest copy will be deleted (see example (62) below). The link fused with the focus feature is ignored by the linearization for purposes of linearizing the chain (the modification of the word structure means that the chain reduction fails to apply) and so multiple copy spell-out becomes possible in virtue of morphological reanalysis or fusion – LCA cannot see the inner elements so chain reduction cannot occur; that is, both copies are allowed to be pronounced without violating the LCA – where the two occurrences are forged into a single morpheme.

62) [FocP[#FocP#[[Vi][Foc°]]][TP[T'[T°[[Vi][T°]]][VP]]]]

5. Conclusion

This research presents an analysis of verb reduplication which builds mainly on Martins' (2007) proposal. It describes double realization of verbs in AS in sentences expressing emphatic affirmation. We agree with Martins' conclusion that Spanish lacks verb movement to Σ and so it does not allow emphatic affirmative sentences with verb reduplication (derived by verb movement to Σ followed by verb movement to C). Nevertheless our analysis shows the occurrence of such syntactic construction in AS. EP and AS are alike in this respect. They share a syntactic account of the phonetic realization of the copies, which suggests that this kind of construction is the same in both languages. In addition, they both have the same motivation, that is, they both use verbal reduplication as a way of getting affirmative

[3] This involves movement of the verb to a focus position preceding TP, then the verb and the Focus head get morphologically fused in the phonological component, and the higher copy of the verb will become invisible to the LCA after the morphological reanalysis. That is LCA will consider just the two lower copies and given that the copy adjoined to T° is the one with more features checked, it will be retained and the lowest copy will be deleted.

[4] Verbs rise in the language, leaving behind copies which may or may not be pronounced at PF.

[5] Following fusion, the linearization computation has one less chain link to evaluate; that is, fused links are invisible to the LCA.

emphatic sentences. However, they differ in many aspects such as in the occurrence of verb reduplication in sentences containing adverbs, clitics and negatives, as well as in some properties of the verbal copies in these constructions, which make them exhibit a different function and in some cases, a different domain.

Appendix

In addition, some more examples from a range of books from Argentina and from some other countries of Latin America will be shown:

Data from Argentina

1) -¿Son muchas las yeguas?
- No señora. Son ocho no más, son. (Güiraldes, *Don Segundo*. In Kany 1951)
'No ma'am, only eight, no more than eight'

2) - Será pa que no se ponga demasiado pedigüeña, será. (Larreta, *El linyera*, I, 27. In Kany 1951)
'She will not be so demanding'

3) -Y te has tomao diez y seis, te has tomao. … Pero si me buscan las broncas hermano, si me buscan. (Romeo. In Kany 1951).
'You have drunk sixteen … if they look for me brother, if they look for me'

4) - Ja! Desde las nueve, están chupando tupido y meta contar cuentos verde estan. (Landriscina 2006)
'They have been drinking a lot since nine o'clock and they are telling stories'

5) - Hay cada pesado hay. (Landriscina 2006)
'That is such an annoying person'

Data from Uruguay

6) - Tengo sentimientos tengo. (Sánchez, *La gringa*, IV,5. In Kany 1951)
'I sure got feelings'

7) - Me hacen un caso bárbaro, me hacen (Montiel, *Montevideo*, p.118. In Kany 1951)
'They really pay attention to me'

Data from Chile

8) - Otra vez que te pille gritando, te voy a … llevate pa lacarabinería, te voy a llevate. (Rojas Gallardo, p. 50. In Kany 1951)
'The next time I find you shouting, I'll take you to the police'

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Metonymy and Metaphor: Continuum or Hierarchy?

Xitao Fu

Abstract

In cognitive linguistics, metonymy and metaphor are widely considered to form a metonymy-metaphor continuum with a middle fuzzy area covered by metaphtonymy or by metonymy-based metaphor. Some scholars claim that metonymy is more central and basic than metaphor and that metaphor is often metonymy-motivated or based. In this paper, I argue that all metaphors are innately based on metonymy in cognition and reasoning; metonymy and metaphor do not form a continuum, rather they form a conceptual hierarchy with metonymy at the base. In communication, metonymy is used for understanding and reasoning on the part of both speaker and listener, but metaphor is interpretative in function on the part of the speaker as distinct from being used for reasoning and understanding on the part of listener.

1. Introduction

Metonymy is traditionally viewed as a figure of speech in which one word or phrase is substituted for another with which it is closely related, and metaphor is defined as a figure of speech in which one word or phrase is used in place of another based on some similarity between two objects or actions or events. They are both considered to involve a transfer of name, a substitution relation between words. What is more, metonymy is generally subsumed under metaphor and taken as a special type of metaphor; thus attention has been focused on metaphor since Aristotle, and a spate of papers and books are devoted to metaphor.

A little different from the traditional rhetorical view of word substitution, the historical semanticists borrow the figures of speech from rhetoric as procedures of semantic change, and regard metonymy and metaphor (the so-called four master tropes, metaphor, metonymy, synecdoche and irony, are often reduced to metonymy and metaphor) as mechanisms of meaning extension. According to Nerlich (2009), historical semanticists such as Robert Thomas (1894) use metaphor and metonymy as terms to designate shifts in meaning across conceptual boundaries, metaphor based on subjective correspondences and metonymy based on objective correspondences. Metaphor and metonymy are treated as semantic changes based on transfers between conceptual spheres.

Later on, the structuralists made a distinction between sense transfer and name transfer and viewed metonymy and metaphor from the perspective of the objective world, considering that metonymy involves one thing standing for another with which it is closely associated and metaphor involves one thing standing for another with which it is similar. In this view, metonymy is a relation of contiguity in sense (Ullmann 1962: 218), a transfer of meaning (Nunberg 1995), a relation between things (Bredin 1984), a modifier-head relation (Warren 1999, 2002, 2006); while metaphor is a relation of similarity in sense (Ullmann 1962: 212). Metonymy and metaphor form two complementary semantic change mechanisms, for contiguity is taken to include any associative relations other than those based on similarity (Ullmann 1962: 212). Jakobson (1956/ 1971) places metonymy and metaphor at different axes, raising metonymy to the same status as metaphor and thus forming two opposite poles. Jakobson views metonymy as the syntagmatic axis, which is based on combination and contexture underlying the external relation of contiguity (uniting the constituents of a context), and metaphor as the paradigmatic axis, which is based on selection and substitution underlying the internal relation of similarity (linking with the code) (Jakobson 1971: 232-233, 1971b: 243-259).

But it is Lakoff and Johnson's (1981) seminal book *Metaphors We Live by* that evokes a worldwide fresh interest in metaphor and metonymy from the cognitive perspective. Although Jakobson mentions 'language in its various aspects deals with both modes of relation' (Jakobson 1971b: 244), he focuses on metonymy and metaphor separately as similarity disorder and contiguity disorder. However, either selection/ substitution (metaphor) or combination/ contexture (metonymy) takes place on the basis of syntagmatic or linear construction. The eligibility and selection of substitutes has to depend on the syntagmatic construction of the utterance; and the possibility of combination of constituents has to rely on the linear construction; and these happenings have to comply with the context of utterance as well, ie the external relation of contiguity, in Jakobson's term. Thus Dirven (2002: 93) considers metonymy and metaphor from the perspective of conceptualization, taking them both as linear in conceptualization, i.e. viewing metonymy and metaphor as a metonymy-metaphor continuum from non-figurativeness to complex figurativeness. Regarding the interaction of metonymy and metaphor in cognitive linguistics, some cognitive linguists, based on the continuum view, see metonymy and metaphor as two opposite poles with a middle fuzzy area covered by metaphtonymy (Goossens 2002), or by metonymy-based metaphors (Radden 2000, 2002; Taylor 2002a). After studying the roles metaphor and metonymy play in conceptualization, some even claim that metonymy is more central and basic than metaphor (see eg Barcelona 2000a; Dirven and Pörings 2002; Gibbs 1994; Koch 1999; Taylor 1995, 2002a) and that metaphor is often metonymy-motivated or based (Barcelona 2000b, 2002b; Gibbs 1994; Kalisz 2007; Radden 2005; Taylor 1995, 2002a). The relationship between

metonymy and metaphor is thus becoming more confused and complicated. So, what is the exact relation between metonymy and metaphor in the conceptual perspective? Is it really a continuum that metonymy and metaphor form?

In this paper, I will try to answer the above questions by first examining the cognitive view of metonymy and metaphor, especially the most widely employed cognitive domain view, sorting out the problems, and second exploring the relationship between metonymy and metaphor from the perspective of cognitive psychology, developmental psychology, semiotics and philosophy. Then I will present improved definitions of metonymy and metaphor according to the above analysis, followed by a conclusion.

2. Metonymy and metaphor in the cognitive view

Distinct from the traditional rhetorical view, which stresses the names, and the structuralist view, which emphasizes the sense, and somewhat like the approach of historical semantics, the cognitive view of metonymy and metaphor underlines the concept. There are three approaches to metonymy (and metaphor) from the conceptual perspective: the cognitive domain approach, the cognitive mental access approach, and the contingent indexical approach.

The cognitive domain approach considers metonymy and metaphor as cognitive processes. In metonymy one domain is mapped onto another within the same domain (matrix) or ICM (idealized cognitive model) or scenario, ie as an intra-domain mapping; whereas, in metaphor, one domain is mapped onto another different domain, ie as an inter/ cross-domain mapping (Barcelona 2002a; Croft 2002; Lakoff 1987; Lakoff and Turner 1989; Ruiz de Mendoza 1996, 2000; Thornburg and Panther 1997). The cognitive mental access approach sees metonymy as a conceptual reference point phenomenon providing mental access to the target concept based on a conceptual contiguity relationship (Feyaerts 2000; Langacker 1993, 2000; Radden 2005; Radden and Kövecses 1999). In line with the mental access view, the contingent indexical approach, which is really a revival of the semiotic view of metonymy as an indexical relation and metaphor as an iconic relation in the conceptual perspective, regards the target meaning in metonymy as a type of meaning elaboration, arguing that the metonymic relation is a contingent indexical relation (Panther 2006).

In the cognitive perspective, the cognitive domain approach is the most widely adopted, and since the other two approaches only take account of metonymy specifically and almost leave metaphor out of account, in this paper I will confine myself to the cognitive domain view. Although the cognitive domain view accounts for both metonymy and metaphor, distinguishing metonymy from metaphor

actually creates the greatest challenge for it. Since both metonymy and metaphor are mappings involving the conceptual domain in the cognitive domain view, then the key terms 'mapping' and 'domain' have to be interpreted and clarified in order to make a clear distinction between them.

2.1 About mapping

Fauconnier (1997) regards mapping as a one-to-one correspondence relation between two sets. Initially Barcelona (2003b) regards mapping as a superimposition of one structure onto another, but later Barcelona (2003a) views mapping as a perspective imposition, ie the target domain is understood from the perspective imposed by the source. Barcelona (2000b, 2003b) believes mapping is also an essential property of metonymy. However, Ruiz de Mendoza (1997, 2000) thinks that relying on domain-internal and domain-external mappings in distinguishing metonymy from metaphor is rather tricky unless these two mappings can be determined unequivocally and that the nature of mapping should be reconsidered. He then takes metonymy as a one-correspondence mapping between domains in the same domain matrix; whereas he sees metaphor as both a one-correspondence mapping and many-correspondence mappings between domain matrices. This view, however, is considered by Panther (2003) to be not generally true, for it is somewhat over-generalized.

Mapping, in its very essence, is a substitution relation. Metaphor is only a partial mapping, for the 'metaphorical structuring involved is partial' (Lakoff/ Johnson 1980: 13); but metonymy is not a mapping in nature. In *She is my joy* you cannot tell which is mapped onto which. Besides, mapping does not describe exactly the actual contiguity taking place in metonymy nor the actual similarity in metaphor. Thus, Ruiz de Mendoza (2000: 130) says that in metonymy the structural relations which hold in the source can hardly be mapped onto the target since source and target stand in an inclusion relationship. Therefore mapping in metonymy and mapping in metaphor are not fruitfully distinguished. We all know that the metonymic cognitive process is quite different from the metaphoric cognitive process. Otherwise it is not necessary to have metaphor and metonymy as opposite poles or as a continuum.

2.2 About domain

Langacker (1991: 547) views domain as any coherent area of conceptualization relative to which semantic structures can be characterized (including experience, concept or knowledge system). Barcelona (2003b: 230) views domain as a cognitive encyclopaedic domain, ie including all entrenched knowledge about the domain a speaker may have. Thus conceptual domain is the structured form of the encyclopaedic knowledge or knowledge network about an entity that a person

possesses. Croft (2002: 166-194) regards domain as a semantic structure that functions as the base for at least one concept profile (typically, many profiles), eg *Circle* (base) and *arc* (profile). He puts forward base domain, domain matrix and domain highlighting. Base domain is the domain immediately presupposed by the profiled concept. Domain matrix is all the domains a concept may presuppose at once, eg *human being: physical object, living thing, volitional agent, etc*. Domain highlighting refers to the phenomenon that makes primary a domain that is secondary in the literal meaning. Thus Croft uses 'domain matrix' to replace 'the same domain', and suggests that metonymy is a conceptual domain highlighting of a sub-domain within the domain matrix, whereas metaphor is a conceptual domain mapping between two independent domains which do not form a domain matrix. The example offered by Croft is

Proust is tough to read

In this example, Proust as a person (literal meaning) is the primary domain, works of Proust as a writer is the secondary domain. This example is highlighting the secondary domain within the domain matrix of Proust as a person.

But domain highlighting applies to both metonymy and metaphor. Lakoff and Johnson (1980: 10) point out 'metaphorical highlighting and hiding'. They write that 'a metaphorical concept can keep us from focusing on other aspects of the concept that are inconsistent with that metaphor.' It means that metaphor involves domain highlighting as well. Ruiz de Mendoza (1997, 2000) also thinks that domain highlighting is applied to metaphor as well. The examples given by him are:

John is a brain

In this metonymy, John's intelligence is highlighted via the metonymic use of 'brain'.

John is a lion

In this example, courage is highlighted both in the source (lion) and the target (John).

So, instead, Ruiz de Mendoza and Díez Velasco (2001), and Ruiz de Mendoza and Pérez Hernández (2001) employ 'domain expansion' (ie source-in-target metonymy) and 'domain reduction' (ie target-in-source metonymy).

However, domain per se as a key term, which is defined as structured encyclopaedic knowledge, is far from determinate. Some scholars think the term 'domain' is rather blurry and it is impossible to make a clear-cut demarcation between boundaries, since the range of domain varies from person to person (Dirven 2002; Feyaerts 1999; Riemer 2002). Dirven (2002: 87) says 'the mere use of the term "domain" does not solve the problem, but it is this term itself which needs clarification.' Panther argues that the notions often used as definitional criteria for distinguishing metonymy from

metaphor such as 'domain', 'single domain', 'sub-domain', 'separate domains' are unreliable for they are cover terms for heterogeneous concepts and conceptual relations (Panther 2006). Feyaerts (1999) points out that drawing distinct boundaries around a domain (matrix) is an arbitrary intervention of a linguist, and it is a methodological problem when the distinction between metonymy and metaphor is based on the arbitrary delimitation of a domain matrix. He thinks 'domain matrix' is a notion too malleable to serve as a criterion for defining metonymy. Taylor also contends that, since domains typically overlap and interact, it is an error to suppose domains constitute strictly separated knowledge configurations (Taylor 2002b). In addition, Panther (2006: 160) pinpoints that Croft's conception that 'metonymy makes primary a domain that is secondary in the literal meaning' is not compatible with the idea that metonymy is a domain–sub-domain or sub-domain–domain relationship.

So the problems with domain are:

(i) Fuzzy boundaries (ie the range). Since domain is structured encyclopedic knowledge, it is open-ended and may vary from person to person.

(ii) Tough domain decision (ie the level). In Croft (2002), domain is raised up to a higher abstract level and thus hierarchies of domains are established. Since domains have hierarchies and are interrelated with each other, you can always find a super-domain, and two domains will always have at least one domain in common that encompasses them, eg a man and a pig might be said to either be in a domain matrix (ANIMATE) or in different domains (HUMAN vs ANIMAL); it is often difficult to name or tell one domain from another.

(iii) Variable perspectivizations. That is, the relation of domain–sub-domain depends on the perspective of the viewer; a domain–sub-domain relation may be also viewed as a sub-domain–domain relation (Panther 2006), eg *The ham sandwich is waiting for his check*. The ham sandwich can be either a domain or sub-domain depending on how you see it. If you see it from the perspective of food, the ham sandwich is the domain, the customer is the sub-domain; if you see it from the other way round, then you get a different domain–sub-domain relation, eg if you see it from the perspective of customer, the customer is the domain, and the food is the sub-domain.

(iv) Same domain metaphors. In fact, we can also have metaphors which involve the same obvious domain, eg *My pet tiger is a lion* (Panther 2006). Tiger and lion are obviously the same domain according to our conscious folk taxonomy of domain (Barcelona 2003b: 231).

So from the above analysis, we can see clearly that the terms 'mapping' and 'domain' in the definitions of metaphor and metonymy in the cognitive view are problematic. Therefore it is really hard to make a clear-cut distinction between metonymy and metaphor based on this view. Simultaneously in their research, cognitive linguists are finding that the relation between metonymy and metaphor is getting more

intertwined and complicated. Therefore the questions concerning the relation between metonymy and metaphor and how they interact in cognition and language become the primary task.

After much work on the interplay of metaphor and metonymy whether in the aspect of cognition or in the aspect of language such as words, idioms, or phrase, cognitive linguists have at last formed two views as I mentioned before in section 1. One view considers metonymy and metaphor form a metaphor-metonymy continuum with a fuzzy middle area; the other holds that metonymy is more central and basic than metaphor in cognition and language (Barcelona 2000b, 2002b; Gibbs 1994; Kalisz 2007; Radden 2005; Taylor 1995, 2002a), and that metaphor is generally metonymy based or grounded (Barcelona 2000a; Dirven and Pörings 2002; Panther and Radden 1999; Taylor 1995, 2002a).

3. Do metaphor and metonymy form a continuum?

Is it really true that metonymy and metaphor form a continuum as the first view claims? Since this claim is presented from the cognitive perspective, in order to answer this question, we will first examine the nature of our cognition, including perceptual and conceptual aspects, categorization and memory function, from the perspective of cognitive psychology and developmental psychology. And then we will consider metonymy and metaphor in semiotics and language and philosophy.

3.1 Metonymy in cognition

Cognitive linguistics considers cognition as embodied. Reality is constructed by the nature of our unique human embodiment, and our construal of reality is likely to be mediated by the nature of our bodies (Evans and Green 2006). What we perceive is only part of the entity. But when we conceptualize, we generally take the entity as an abstract whole. Thought is contended to result from our ability to act in the environment. It means that our cognitive actions are goal-directed in certain settings, which further indicates that in cognitive actions we just pay attention to what is meaningful to us, actually in mind. We can 'look without seeing'; and 'inattentional blindness is probably the fate for much of the perceptual information we process' (Mandler 2004a: 69). Our embodied cognition is innately generalizing and abstracting. We are born with the capacity to conceptualize the world and to bring aspects of the perceptual world to conscious awareness. Our perceptual system and conceptual system develop simultaneously from birth (Mandler 2004a). We are born with the capacity to search for relations (which therefore determines the ability of generalization and abstraction), relating entities beyond ourselves, relating entities with ourselves, through actions. 'Actions are central in organizing the beginning

conceptual system from birth' (Mandler 2006: 111). The initial conceptual categories are abstract and global, and conceptual development frequently goes from the abstract to the concrete (Mandler 1999; Mandler and McDonough 1998). The process from the abstract to the concrete and then from the specific to the abstract is unavoidably metonymic in the core sense of metonymy in rhetoric, in historical semantics, in structural linguistics, and in cognitive linguistics.

Concepts are formed and represented as prototypes (Rosch 1975). A prototype is an organized set of knowledge that reflects the best example of a category (Trenholm and Jensen 2004: 144). We humans have an insatiable appetite for categorization (ibid: 140). The capacity to categorize is the most fundamental of human capacities (Lakoff 1987: 8). Categories do not have criterial features but harbour prototypes, with less prototypical members being apprehended with reference to the extent that they resemble (or fail to resemble) the prototype (Gardner 1985: 346). Prototypicality exists because it is cognitively advantageous – prototypical categories carry both structural stability and flexible adaptability: on the one hand, the categorical system can only work efficiently if it can maintain its overall organization for some time; on the other hand, it should be flexible enough to be easily adaptable to changing circumstances. Prototypically organized categories are particularly well suited to fulfill this double demand for flexible adaptability and structural stability (Geeraerts 1988: 227).

We construct our own reality by structuring, stabilizing, and relating the stream of stimuli around us in meaningful ways (Trenholm and Jensen 2004: 146). We keep in mind what is meaningful to us, but recall partially what has happened and continually construct our memory according to what we pay attention to in the current situation. Memory is actually a process of construction, It is the dynamic interplay between inner (processes) and outer (settings) (Engel 1999: 6-8). People do not reproduce from memory exactly what was but at least partly reconstruct what was, based on what must have been (Trenholm and Jensen 2004: 144).

Furthermore, according to Mandler (1998: 147-169), just like our conceptual system formation, our memory is also organized in a hierarchical way, ie from global or super-ordinate to specific. We always conceptualize an entity as a member of a super-ordinate class; the association of features to objects in semantic memory occurs via the super-ordinate; the data on acquisition and breakdown of the semantic system suggests that super-ordinate categories are more resilient and longer-lasting than more detailed subdivisions, and the super-ordinate is the 'first in, last out', because more detailed concepts are constructed out of super-ordinate ones and their most fundamental meaning stems from their super-ordinate class membership. Therefore every aspect of our cognition is innately a part-whole, whole-part,

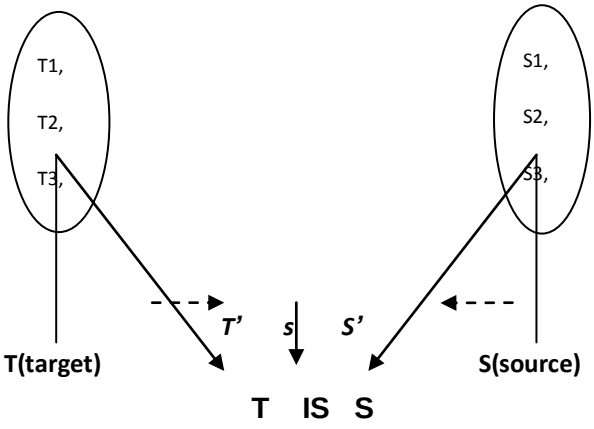
contiguous relation, ie metonymic in nature, which advances with and underlies our acquisition and use of language. So our conceptualization, categorization and memory all function metonymically. All in all, our cognition is metonymic in nature.

3.2 Metaphor in cognition

Whether metaphor is taken as a figure of speech in old rhetoric or as a mechanism of semantic change in historical semantics and structural linguistics or as a figure of thought in cognitive linguistics, metaphor is considered to take place between two different entities based on comparison, contrast and similarity. But where does the similarity or similar aspect come from? From the perspective of cognition, it definitely comes from the entities separately perceived and conceptualized, ie this relation between two derives from individual elements. As I have argued in section 3.1, the aspect of the specific individual representing the individual as a whole in cognition is utterly metonymic, and this aspect of the individual is then employed metonymically in place of the whole individual to form a similarity relationship with an aspect of another individual entity, thus creating a metaphor. That is to say, metaphor as a cognitive process is formed on the base of metonymy in cognition. The analysis of metaphor in the Theory of Lexical Concepts and Cognitive Models or LCCM theory shows that metaphor is an interpretative process in which integration guides the access to the secondary cognitive model profile through the first cognitive model, and this access is definitely provided by metonymy (Evans 2006b; Evans and Zinken forthcoming) (for details of LCCM theory, see Evans 2006a, 2006b). This is also why Barcelona (2000b: 31) claims that 'the target and/ or the source must be understood or perspectivized metonymically for the metaphor to be possible'. So from this point, we can claim that conceptually metonymy and metaphor do not form a continuum as some cognitive linguists announce, but rather they form a hierarchy with metonymy as the base and metaphor as deriving from metonymy.

This point can be shown from the perspective of semiotic cognition, as shown in the following diagram. Entity T (target) involves many properties, features, functions, etc. such as T1, T2, T3, T4 … Tn. Entity S (source) may as well have many properties, features, functions, etc. such as S1, S2, S3, S4 … Sn. All these are aspects of the entity, or to use the term in cognitive linguistics, part of the entity domain. From the diagram we can see that in order to form a metaphor, we have to have conceptualized the source entity before we come to the target. As I have mentioned above in section 3.1, our conceptualization is metonymic in nature, our memory is dynamic, we reconstruct our memory according to what is meaningful to us (thus pay attention to it), our memory is a network of meaning, and it is always searching for meaningful connections with outer settings. Thus when we pay attention to T, we will obtain at least one aspect of T, say, T', that is meaningful to S (actually to some

aspect of S, say, S') in similarity. Once this similarity relation is established in cognition, the metaphor **T is S** is formed. Therefore from the forming procedure of metaphor, we can see clearly that metonymy plays a vital role in metaphor derivation.



(The long solid arrows express perspectivization; the broken arrows express metonymic representation; the short solid arrow expresses formation; the small 's' means similarity in relation.)

The above is from the normal cognition; in order to see more clearly the metonymic base of metaphor, we will look at this point from the other side – from the abnormal cognition perspective, ie aphasia.

Although Jakobson (1971) treats similarity disorder and contiguity disorder as two different types of aphasia and considers the first as deficiency in selection and substitution and the latter as deficiency in combination and contexture, he places these two as opposite patterns. He thus posits that 'every form of aphasic disturbance consists in some impairment, more or less severe, either of the faculty for selection and substitution or for combination and contexture' (Jakobson 1971: 254). If we argue that metonymy is the base of metaphor, then we have to relate these two disorders of aphasia in some way and give rational interpretations of the proposed relationship between metonymy and metaphor in aphasia.

According to Jakobson, for the type of aphasia that involves similarity disorder, contiguity determines the patient's whole verbal behaviour, eg *fork* is substituted for *knife*, *table* for *lamp*, *smoke* for *pipe*, *eat* for *toaster*; for the opposite type of aphasia, contiguity disorder, ability of combining words into syntactic construction is impaired, and only content words are used, forming the so-called telegraphic style and diminishing the extent and variety of sentences, e.g. *fire* for *gaslight*. Since similarity disorder aphasia is taken as metonymic in nature, we here just discuss the

aphasia of contiguity disorder. Jakobson treats contiguity disorder as metaphoric. This kind of patient cannot dissolve linguistic units such as words and sentences. Let's see the examples Jakobson gives: this kind of patient uses *spyglass* for *microscope* and *fire* for *gaslight*. It seems that the relationship between *spyglass* and *microscope*, and between *fire* and *gaslight* is a similarity relation, ie microscope is (like) spyglass in some way, and gaslight is (like) fire in some way. But here we have to take into account two aspects. When the patient uses *spyglass* for *microscope* or *fire* for *gaslight*, (s)he must have in mind already the presupposed propositions MICROSCOPE IS LIKE SPYGLASS and GASLIGHT IS LIKE FIRE for the metaphoric utterance (or inference) to be made; this is a linear construction in cognition and formed through a metonymic cognitive process, otherwise the patient cannot utter *spyglass* to stand for *microscope* and *fire* for *gaslight*. That is to say, this kind of aphasia is based on contiguity, i.e. metonymy.

The other aspect is the complexity of aphasia. It is obvious that Jakobson simplifies the problem and classification of aphasia. Aphasia involves many aspects such as inability to comprehend language, inability to pronounce, inability to name objects, inability to form words, inability to read, inability to write. But aphasia is not a loss of intelligence. So we have to consider the conceptual aspect and the verbal aspect as well. Ciepiela (2007: 199-208) makes a study of metonymy in aphasia involving both conceptual and verbal aspects. The experiment results show two significant points: one is that the experiment confirms that metonymy is both a cognitive and a language phenomenon; poor performance on conceptual tests coincides with low efficiency in the language test. The other is that contrastive patterns of language breakdown do not exist as Jakobson claims. In aphasia both metonymy and metaphor processes are impaired to some extent; they operate in parallel, although metonymy is primary, a more primitive, experientially grounded process, and metaphor is more restricted in aphasia. That is to say, metaphor is based on metonymy from the perspective of aphasia.

Another respect from which we can see that metaphor is metonymy-based in cognition is to look at conceptual metaphor as put forward by Lakoff and Johnson. Lakoff and Johnson (1980: 4) present conceptual metaphor to conclude that the following linguistic expressions derive from the shared conceptual metaphor ARGUMENT IS WAR:

- Your claims are *indefensible*.
- He *attacked every weak point* in my argument.
- His criticisms were *right on target*.
- I *demolished* his argument.
- I've never *won* an argument with him.
- You disagree? Okay, *shoot*!
- If you use that *strategy*, he'll wipe you out.

- He *shot down* all of my arguments.

They think that the reason we talk this way is because we have the conceptual metaphor ARGUMENT IS WAR, which determines our talking, and thinking as well, about arguments in terms of war. They therefore claim that our ordinary conceptual system is fundamentally metaphoric in nature.

Despite the logic of their claim, the question we may immediately ask is: if there are any conceptual metaphors, how and where does this kind of conceptual metaphor come from? It is certainly not inborn. It comes from our separate experience of WAR and ARGUMENT, and separate conceptualization of WAR and ARGUMENT, which operates in the cognitive process of metonymy. To form the so-called conceptual metaphor ARGUMENT IS WAR, we have conceptualization of WAR and conceptualization of ARGUMENT separately and probably in a successive way, both metonymically, and then we will find some similarity connection between these two concepts due to some functional contextual factors prior to the formation of the conceptual metaphor ARGUMENT IS WAR. So it is very obvious that the conceptual metaphor Lakoff/ Johnson form is the result of a second stage of the cognitive process, it is a second inferencing or reasoning. Conceptually, WAR and ARGUMENT are formed metonymically, and then these two concepts are combined into a metaphoric formula. Metaphor is inevitably based on metonymy, and our perceptual system and conceptual system are fundamentally metonymic in nature. Thus metonymy is the default cognitive process, and metaphor is the second stage cognitive process, based on metonymy.

4. Defining metonymy and metaphor

From section 2 we know that metonymy and metaphor in the cognitive domain view are not actually clearly defined and distinguished given the existence of the blurry terms ‘mapping’ and ‘domain’. From the analysis in section 3, we realize that metonymy and metaphor do not form a continuum but rather a cognitive hierarchy. Based on this viewpoint, it seems necessary that metonymy and metaphor need redefining according to how they function in cognition and in communication so that we can have a thorough understanding of metonymy and metaphor as cognitive processes.

Lakoff and Johnson (1980: 36) think that the primary function of metonymy is referential and the primary function of metaphor is to facilitate understanding, but they point out at once that metonymy is not merely a referential device, it also serves the function of understanding. Therefore, according to Lakoff and Johnson, both

metonymy and metaphor serve the functions of aiding understanding, on the one hand, and, on the other, providing reference by highlighting a certain aspect of what is being referred to. Dirven (2002: 105) also connects metonymy with the representational or referential function, but by contrast with Lakoff and Johnson he connects metaphor with what he calls the expressive function. As we all know, language as a system of symbols is referential (ie indexical) in nature in the first place. 'Linguistic symbols are social conventions by means of which one individual attempts to share attention with another individual by directing the other's attentional or mental state to something in the outside world' (Tomasello 2003: 8). And regardless of whether we focus on understanding or expression as additional functions, each derives from the elementary referential function, which also shows that metaphor comes from metonymy in language.

From the perspective of its origin, language is not used primarily for understanding, or conceptualization, as I would prefer to term it, but rather for expression – using language to refer to what we intend to express, to be specific. That language is meaningful to us only relies on what we do with language. From the perspective of developmental psychology, especially cognition development and language development, according to Mandler and her colleagues (Mandler 2004a, 2004b; Mandler and McDonough 1993), babies have to have some conceptual base developed first for the development of their language. Before infants start to learn language, they have developed some cognitive prerequisites: a rich understanding of the external world, the ability to infer the referential intentions of others, the ability to use and understand motivated signs (both icons and indices), the ability to imitate (Burling 1999). They do think before they have language. Babies form global concepts through generalization and abstraction from what is meaningful to them before they acquire language. This understanding comes before language, but language is undoubtedly a great enhancing device for cognition. We can experience, say, pain, without language, but we have to resort to language for recall, referring and thinking about the experience, because we can not re-experience how we felt (Mandler 2009, personal communication). Thus language is actually referential in nature and it is used to express and do things.

Cognitive linguistics stresses the conceptual aspect, neglecting the expressive aspect of language, to be specific, of metonymy and metaphor. Although recent research in psychology suggests that there is no principled distinction between language comprehension and language production (Wilshire 2009, personal communication), yet there may exist distinctions between what we think and what we utter, between the speaker and the listener. Since human cognition is embodied, according to embodied cognition theory, cognition is inevitably primarily goal-directed (Cowart 2009). Besides inner conceptual activity, we have outer expressing activity as well.

We do not always necessarily utter what we are actually thinking, especially in communication. Thus we have to take into account the expressive aspect of language as well as the purely conceptual aspect (Geeraerts 1988: 225). Language is used for doing things; language use is really a form of joint action (Clark, 1996: 3). We use language to express ourselves so as to communicate with others, and so on; we use language not merely to conceptualize the world. That is to say, we have to take into account the other aspect of metonymy and metaphor as cognitive processes, i.e. their expressive aspect, especially when dealing with communication in dialogic discourse.

In dialogic discourse, the speaker and the listener will undergo different experiences when expressing and understanding metonymy and metaphor. The speaker, before uttering a metaphor, has already identified the similar aspect(s) of the source and the target and understood them quite well in the situation, so this process consists of perceptualizing and conceptualizing the source and the target separately and finding the similar aspect(s). Therefore metaphor on the part of the speaker is not primarily used to understand something as Lakoff/ Johnson (1980) claim, but rather to express his or her understanding of this kind (which is metonymic in nature). But what the listener has to do when he or she hears the metaphor uttered by the speaker is first to figure out what the similarity is between the source and the target according to the utterance and the uttering situation. Only once the listener has figured out the similar aspect(s) of the source and the target created by the speaker can he or she understand what the speaker means in using the metaphor. The metaphor from the speaker invites understanding and inferencing from the listener. So on the part of the listener, the main process is to make sense of the metaphor the speaker has uttered. Therefore, in dialogic discourse, metaphor is used to express or interpret on the part of the speaker, and to understand on the part of the listener. Quite different cognitive process are involved in employing metaphor (in utterance) and in understanding metaphor.

When metonymy is used in the speaker's utterance, it suggests that the speaker has already conceptualized the whole, using the part to represent the whole, or vice versa, and at the same time he or she assumes that the listener has the same experience as he or she does. The reason for this metonymic conceptualization is that the very part is the most meaningful to the speaker in the specific setting.[1] In cognition we are always attentive to what is meaningful to us in the particular setting. On the part of the speaker, metonymy is a cognitive process, consisting of perceiving, conceptualizing, identifying and reasoning. It is a specific

[1] Here, 'meaningful' is not used in the linguistics sense, but in the cognitive sense. Following Mandler (2009, personal communication), 'meaningful' is meant to be what makes it predictable and memorable, which lies in what we do with the material in question, not something that resides intrinsically in this or that thing.

perspectivization of the conceptualization process of the speaker, generally based on common experience. This perspectivization of cognition reflects the speaker's standpoint, emotion, illocutionary act, attitude, etc. It is employed in utterance for a listener whom the speaker assumes has had the same experience in the shared setting. So the listener undergoes the same experience in cognition as the speaker based on the shared knowledge and common experience, because the use of metonymy in dialogic discourse means that the speaker presupposes that the listener has had the same or at least similar conceptualization of an experience as the speaker in the common setting of cognition. For example, in the movie *Point Break*, when the FBI special agent Johnny Utah goes to see the regional commander, the receptionist picks up the phone and says to the head: 'Your *nine o'clock appointment* is here.' The head replies: 'Let *him* in.' The receptionist uses 'nine o'clock appointment' to refer to Johnny, because, in her cognition, what is the most meaningful to her as a receptionist is the time of appointment, rather than the name of the person although she knows it as well, therefore her conceptualization is specifically perspectivized on the time of appointment, with the name of the person in the background. The listener in this case can easily know what she means for he has the same or similar cognitive experience already. It is a kind of ready use in cognition and a pick-up in utterance.

What's more, in employing metaphors, the speaker tends to keep his perceived/ conceived similarity or similarities between two entities hidden or unspecified, leaving it or them for the listener to figure out. For example, 'All marriages are iceboxes' (Glucksberg and Keysar 1993). The similarity relation between *marriages* and *iceboxes* is quite clear to the metaphor creator (ie the speaker), but he uses this metaphoric formula to generate a contrast and comparison between *marriages* and *iceboxes*, with the assumption that the listener is able to figure out what this contraposition is based on. In other words, by the metaphoric expression the speaker tends to keep the key to the relation between *marriages* and *iceboxes* covered but saliently presupposed in the eye of the speaker. The listener is expected to infer what is presupposed and covered. However, in employing metonymy, the speaker just picks up the salient aspect of the entity to represent the entity proper; this salient aspect is also very obvious to the listener in the speaker's view. For instance, 'Senior midfielder Simon Elliott hopes the local factor might galvanise the All Whites to victory in Wellington…' Here the All Whites is used metonymically for the New Zealand national football team. This point is obvious for the same reason as *the Blues* example mentioned below. Therefore, metaphor seems to give you the end result from which to infer the presupposition or reason why they are thus formed, while metonymy seems to offer you the obvious clue to infer the target, with the formula relation between the clue and the target already established and well-known in a certain cognitive framework.

Thus from the perspective of cognizing and expressing (utterance), metonymy can be viewed as a cognitive process of perceptualizing, conceptualizing, identifying, reasoning one in terms of another based on experience of co-occurrence and co-presence. Metaphor is a second stage cognitive process of interpreting and reasoning one (the target) in terms of another (the source) based on the presupposed perception/ conception of similarity or similarities between the two.

In cognition, metonymy is inductive in nature, from specifics to a general. For example, the English Premier League football team *Liverpool* always wear all-red home kit, thus they are called *The Reds* metonymically. The same applies to the team *Chelsea*; it is metonymically called *The Blues*. But metonymy is also a matter of abduction and deduction when the reasoning is from the general to specifics. Whereas metaphor, as shown in section 3.2, is a further inductive reasoning between two entities, based on metonymic process.

5. Conclusion

We perceive the world around us, but we only bring part of it to our attention and to our consciousness. Our conceptualization of motion, object, event, is based on our specific perspectivization of them; this process is metonymic in nature. Human cognition is inevitably metonymic from the very beginning. From infancy, we categorize entities as prototypes through generalization and abstraction. We associate features to entities via the super-ordinate; the super-ordinate being crucial for the formation of specific concepts in the first place (Mandler 1998: 167). We keep what is meaningful in memory and relate what is meaningful in the current setting to what is in memory; we thus reconstruct our memory metonymically according to our attentive perception and conception in the specific situation. Metonymic cognition is the default process on which metaphor is based and formed. We form concepts of entities through metonymic perspectivization of the entities as individuals; we form metaphors through comparing and contrasting specific metonymic perspectivization of individual entities. In cognition metonymy and metaphor do not form a continuum; rather they form a hierarchy with metonymy as the base and metaphor as the derived element. Therefore, diachronically, the relation between metonymy and metaphor undergoes the development from a two-axis to a one-dimension continuum, to a three-dimension cubic hierarchy.

As different cognitive processes, metonymy and metaphor have different functions. But we have to take account of both the conceptual function and expressive function. Metonymy is used to understand and express on the part of both the speaker and the

listener with respect to common experience. Metaphor is employed to express a conceptual figuration formed by the speaker, where the listener has to use the formed metaphor to understand what the speaker intends to express through the search for similarity, metaphor therefore is used to understand on the part of the listener. Thus metonymy is a process of both conceptualizing the entity from a certain perspective and expressing this conceptualization. Metaphor is a process of both reasoning (based on metonymy) and expressing this reasoning; it is a further inductive reasoning from metonymy.

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Language-Specific Cues – A Cue to Language?

Anna Piasecki and Paul Warren

Abstract

A key issue in psycholinguistic research on the nature of the coexistence of two (or more) languages in the cognitive system of a fluent bilingual speaker include the nature of lexical access (*selective* vs *non-selective*). In the context of the *non-selective access* view, we investigate the extent to which sub-lexical information (eg language-specific cues, such as onset capitals for German nouns) is sufficient to constrain or eliminate lexical interaction between the bilingual speaker's languages. We also consider the extent to which the use of such information is affected by priming for a specific language from a preceding sentential context. To gain insight, experimental data from English-German bilinguals representing three different proficiency levels was collected, who listened to a sentence frame in either L1 or L2, and then performed a German (L2) lexical decision task to a word presented visually immediately after the frame. Error data shows that language-specific cues have an increasingly facilitatory effect on lexical access with increasing proficiency levels. In addition, context language effects decrease with increasing proficiency level. Response time analyses, on the other hand, reveal a delay for German-biased items, ie those with onset capitalisation. We discuss these results in the context of models of bilingual language processing.

1. Introduction

In the introduction to his chapter on visual word recognition (VWR), Balota (1994: 303) noted that '[the] word is as central to psycholinguists as the cell is to biologists'. This is reflective of the fact that VWR research has been one of the central focal points of investigation in psycholinguistics, experimental psychology and, more generally, cognitive science for more than a century now. Andrews (2006) suggests three main reasons for this. Firstly, interest in VWR arose because the ability to recognise words is the baseline for literacy. Secondly, experimental designs investigating word recognition processes provide a vehicle for exploring other cognitive processes, such as memory structures and psychopathological disorders (eg aphasia). Finally, research in this area offers crucial insights into pattern recognition and memory retrieval.

Given the importance of VWR research, it is surprising that its extension to the bilingual domain has only been relatively recent (eg Nas 1983). This is even more

surprising, considering that bilingualism[1] (if not multilingualism) is the norm in most parts of the world. Given this, it would seem important to examine bilingual VWR processes. Of course, insights from such research also have implications for how to teach vocabulary, or a second language in general.

The research presented in this paper singles out one aspect of bilingual VWR for exploration: the nature of sub-lexical information. First, in section 2 we briefly summarise relevant bilingual research to date, and introduce the main issues of relevance to bilingual VWR. In sections 3 and 4 we consider the organisation of the bilingual mental lexicon and the role played by sub-lexical information in lexical access in bilinguals. More specifically, these sections discuss and attempt to measure the extent to which language-specific information can be used to speed up the processing of presented words. Moreover, we investigate the point at which such information becomes available during the word recognition process, and the level of representation of the information used (eg sub-lexical, lexical level). Finally, we present some preliminary conclusions and suggestions for further research.

1.1 A model of bilingual lexical processing

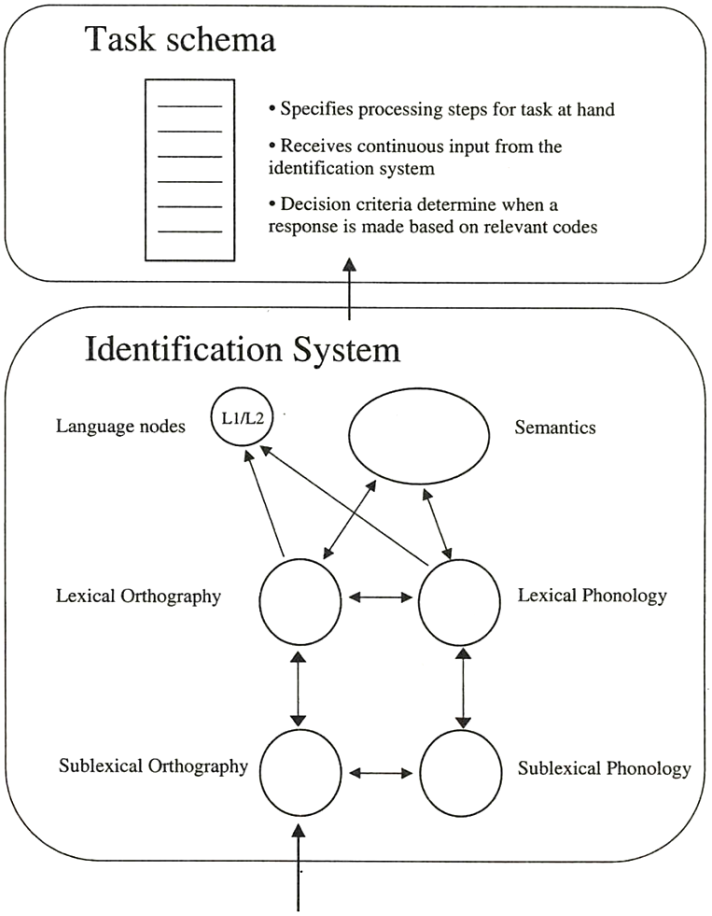
On top of the processing issues faced by a monolingual reader, bilingual readers must cope with the activation of two languages. A priori it seems reasonable to assume that two languages coexist in the cognitive system of a fluent bilingual speaker. A considerable amount of psycholinguistic research has been devoted to determining the nature of this coexistence (eg Brysbaert et al 1999; Kroll and Stewart 1994; Dijkstra and Van Heuven 1998). This research includes an increasing focus on bilingual VWR.

To date, the most prominent theoretical model of bilingual VWR, and one which provides an account for most of the recent research findings, is the Bilingual Interactive Activation Plus Model (BIA+) proposed by Dijkstra and Van Heuven (2002). This model (Figure 1) assumes that lexical information from a bilingual's two languages is represented in an integrated lexicon to which there is non-selective access (see section following for further discussion of lexical storage and access selectivity). Thus, in the initial stages of lexical retrieval, there is interactive, bottom-up, and non-selective activation of lexical information across a bilingual's languages. In terms of the model's architecture, the BIA+ contains a range of linguistic information: not only orthographic, phonological and semantic representations, but also language nodes. The orthographic and phonological representations are, in addition, extended over two processing levels, namely the sub-lexical and lexical levels. According to Dijkstra (2005: 197), access to lexical representations can be triggered solely on the basis of such linguistic information. The information flow

[1] For the sake of consistency, we have taken the term 'bilingualism' to include second and foreign language situations. Due to space limitations we will not further explore the differences between the different terms, although we are aware that the term *bilingual(ism)* is contentious. For present purposes, it is important to note that the term is being used here to include relatively high proficient second language (L2) learners.

then proceeds to the task/ decision system. The task/ decision system is assumed to be affected by extra-linguistic factors, such as participants' expectations or task demands. While these variables can in turn influence the output of the word identification system, they cannot influence the activation state of words. A further important feature of the model is the set of language nodes. These are proposed as representations of language membership.

Figure 1 The architecture of the BIA+ model (Dijkstra and Van Heuven 2002)
L1, first language; L2, second language



It has been claimed (eg Dijkstra and van Heuven 2002: 182ff.) that the BIA+ model can accommodate a large amount of research that supports non-selective access, as well as some of the more specific differences that arise across different task designs. The following section will provide a more detailed examination of some of these relevant issues (including differences between experimental tasks), and will point out areas where the model is under-elaborated (eg the relative importance of sentential context or proficiency level).

1.2 One lexicon or two?

A central issue in bilingual VWR research has been the distinction between language-dependent and language-independent lexical storage. That is, some

researchers have argued for the co-existence of two separate lexicons – one for each language – while others have argued for the existence of a single integrated lexicon for both languages.

Within research that argues for *two* mental lexicons, evidence has been presented that indicates strong cross-language connections at different levels: at the sub-lexical level (eg Brysbaert, Dyck et al. 1999), at the lexical level (eg von Studnitz and Green 2002), and/ or at the conceptual level (eg Kroll and Stewart 1994). Given those strong interfaces between languages, two questions have been addressed. Firstly, can a bilingual ever function in the L1 or L2 without constant influence of one language on the other? Secondly, how well or poorly can a bilingual activate only the appropriate language at the appropriate time and to the appropriate extent? The first issue is generally referred to as *selective* versus *non-selective access* (see discussion below). The second issue involves *cognitive control* (see Dijkstra and Van Heuven 2002 for a review of both issues).

Within research that argues for *one* mental lexicon, two further questions arise. First, when bilinguals are presented with visual stimuli, how do they know what language an input item belongs to? It is now assumed that this kind of information must be stored in the bilingual's mental lexicon for each word. Some researchers talk of a *language node* (Dijkstra and van Heuven 1998), others of a *language tag* (Green 1998). Possibly, each word has its own separate language tag/ node; alternatively, all words of one language may share their language tag/ node – more explicit information on the nature of such tags or nodes is still lacking (Dijkstra 2005). Second, if a bilingual's two languages share the same orthography or script (eg both roman script), which lexical candidate is activated (ie from L1, from L2, or from both languages) when a letter string is presented? This is a further issue that is discussed under the heading of *selective* versus *non-selective access*.

Based on evidence from a range of task designs, the majority of researchers now seem to agree that there is non-selective access of lexical information across a bilingual's two languages during VWR (eg van Hell and Dijkstra 2002; Schwartz and Kroll 2006). However, much of the crucial research has been based on the comprehension of words in isolation. In response to this, a new research direction has emerged, one which creates bilingual conditions which are more true to an everyday situation by, for instance, embedding experimental stimuli in sentential contexts. Although literature on this topic is still scarce and discussion is still at an early stage, some initial results suggest that certain factors may constrain (if not eliminate) lexical interaction between languages (Elston-Güttler, Gunter et al 2005; Duyck, Assche et al 2007). For instance, Elston-Güttler and her colleagues (2005) tested the recognition of interlingual homographs (letter strings that correspond to words in both languages) in German-English bilinguals (ie German learners of English). They used a task design in which participants had to read for comprehension a visually-presented sentence, and subsequently carry out lexical decision on a single word presented after the sentence. On critical trials, the sentences ended in an interlingual homograph (in italics in the example) and the target item for lexical decision (in small capitals in the example) was related in meaning to the non-target, L1 meaning of the homograph:

> The woman gave her friend an expensive *gift* – POISON (= meaning of German word *Gift*).

When these prime-target word pairs were presented in isolation, the L2 (English) homograph always primed its L1 (German) meaning, suggesting non-selective access. However, homograph priming in sentence contexts was only found in the first three blocks of the experiment, and was absent from the remaining three blocks. Moreover, it was only found for participants who saw a German movie prior to the experiment, which increased their L1 activation. The authors' interpretation of the results was that participants adapted their lexical decision thresholds during the experimental session. They called this process 'zooming into' the all-L2 task. The authors claim that changing from one entire language context to another and staying there is likely (even in the usually less dominant L2), given a language-exclusive task. This 'adjustment of language mode settings' (Elston-Güttler et al: 58) is clearly based on Grosjean's (2001) concept of language modes (monolingual, bilingual or an in-between setting). The two concepts differ in a way that most probably reflects differences in task demands – Grosjean's concept assumes the type of continuous language-switching found in most natural bilingual situations, whereas Elston-Güttler et al refer to a complete adjustment from one monolingual setting into another monolingual setting.

A question linked to Grosjean's (2001) concept of language nodes and the findings discussed above, but one which has not received much attention, is the extent to which proficiency may have an effect on non-selective access. In one recent relevant study, Chambers and Cooke (2009) argued that context has a stronger impact than proficiency level on parallel language activation during spoken language. In their study, non-native speakers with varying proficiency levels viewed visual displays while listening to French sentences, such as:

> Marie va décrire la poule (= Marie will describe the chicken).

Visual displays depicted several objects including the final noun target (eg 'chicken') and an interlingual near-homophone (eg 'pool') whose name in English is phonologically similar to the French target ('poule'). The researchers measured listeners' eye movements during target noun playback. One observation resulting from this experiment was that there was temporary lexical competition for interlingual homophones. The same pattern was reported for lower as well as higher proficiency listeners in low constraint sentences (ie sentences where there is no clear bias towards either meaning of an interlingual homophone). Apart from this finding being slightly surprising, it is possible that an entirely visual task will have a different influence on (increasingly highly proficient) bilingual lexical processing.

1.3 Language-specific sub-lexical information

A final unresolved question appears to be whether information about which language is being read or heard can be used to speed up the processing of presented words (eg Dijkstra 2003; Dijkstra 2005). To illustrate, referring to research conducted

by Kroll and Dijkstra (2002) and Schwartz et al (2000), Dijkstra (2003: 20) hypothesised that

> [even] when two languages are closely related and are represented by the same script, words may contain *language-specific cues*. Examples are the diacritical markers (accents) of French and the onset capitals for nouns in German. In such cases, the use of these cues might quickly reduce the number of competitors of an item to those of the target language. […] There is some preliminary evidence that language specific bigrams and other cues may indeed affect the selection process, but much more study is necessary here.

If language-specific information does affect the selection process, then a further question concerns the point(s) (sub-lexical level, lexical level, etc) at which such information becomes available during the word recognition process (Dijkstra 2005). A measure of the availability of such information is the extent to which it facilitates word recognition. In other words, assuming that such information is available soon enough, it might help to speed up word recognition by excluding lexical candidates from the non-target language.

2. Experiment

Given the rationale above, the aim of this study is to explore the nature of sub-lexical information (ie in the form of language-specific cues) on bilingual visual processing. To achieve this, the following research questions were addressed:

(i) To what extent can sub-lexical information (eg in the form of language-specific cues, such as onset capitals for German nouns) facilitate or inhibit bilingual VWR? Is this information sufficient to constrain (if not eliminate) lexical interaction between the bilingual's languages?

(ii) If sentence context affects the speed of word recognition, then bilinguals might be slower to recognise a stimulus in a language that differs from the language of the context sentence (Dijkstra 2005). Consequently, how well can a bilingual either use or discard sub-lexical information in specific language contexts?

(iii) What effects might L2 proficiency have on the manifestation of facilitatory versus inhibitory dynamics?

2.1 Participants

Sixty-five native speakers of New Zealand English completed two experimental sessions which were approximately seven days apart. Recruited participants were current and former students from Victoria University of Wellington, with varying knowledge of German. The participants were selected to represent one of three levels of proficiency (labelled 100-, 200- and 300-level, based in most cases on their course enrolments). To test their German knowledge individually and in order to

acquire other relevant information, each participant filled out a language questionnaire and completed a German language proficiency test (adapted from Lemhöfer 2004) following the second experimental session. All participants signed a written informed consent, had normal or corrected-to-normal vision and no hearing impairment. Participants received a voucher for their participation.

2.2 Materials

During an experimental session, participants listened to a sentence fragment in either their first language (English) or their second language (German), and then performed a German lexical decision task to a word presented visually immediately after the fragment, ie they indicated whether or not the word was a real German word, by pressing one of two response buttons. As this experimental design involved an acoustic prime followed by a visual lexical decision task, primes and target items needed to be carefully selected and prepared for use. This included selecting critical target words (interlingual homographs or IHGs), selecting matched control words and nonwords for comparative analyses with critical stimuli, and then designing sentence frames (ie primes) to place these items into.

2.2.1 Selecting target words

Item construction was done in the following way. First, a list of interlingual homographs was created which was partly based on Elston-Güttler et al's (2005) item list and partly extracted from an English learner's dictionary (1999). To ensure that lower proficiency learners of German would be familiar with these items, the existing selection was matched against an entry in the vocabulary list from an elementary German learner's course book (Perlmann-Balme and Kiefer 2002) provided by a German course instructor. Meeting this criterion left us with 39 items, all of which had one meaning in English (cf *hose* = 'pipe') and another one in German (cf *hose* = 'trousers'). The Appendix contains a complete list of the 39 target words. The majority of the selected items were nouns in both languages. In a few cases, however, a German noun would belong to a different word class in English, and vice versa, or an item would belong to a different word class than a noun in both languages (commonly being an adjective, verb or adverb; usually varying across the two languages).

Note that each critical item (IHG) was presented twice in the course of the experiment, in different sessions (see further information on the experimental design below). To provide real word controls, for each IHG a pair of real word (RW) German items (eg *mut* and *uhr*) was selected using the WordGen programme (Duyck et al 2004), which uses the CELEX database (Baayen et al 1993) as a resource. One member of each RW control pair appeared in each session. These control items, consisting of 78 items in total, were matched with the set of IHGs for number of letters, number of German noun neighbours, and German log frequency per million (see Table 1). To match the critical stimulus set as closely as possible, the control RWs were mainly nouns, but also included verbs, adjectives and adverbs.

Finally, 156 nonsense words (NW) were created, again using WordGen (Duyck et al 2004) and CELEX (Baayen et al 1993). As with the RWs, pairs of NWs (78 NWs in total) were developed as matches to the IHGs, based on number of letters, number of German noun neighbours, and German bigram frequency (see Table 1). The remaining 78 NWs were matched in the same way to the set of 78 German control words (RWs). Care was taken to ensure that all nonsense words obeyed German orthographic rules and were not existing English words. Overall, half of the stimuli in each session were real words (either IHG or RW stimuli) and half were nonsense words, meaning that half of the lexical decision responses were targeted at a 'yes' response and other half at a 'no' response.

Table 1
Mean letter length, count of German noun neighbours, and frequency of different target item types, with standard deviations in parentheses

Target Items	Target letter length	Target noun neighbour count	Target frequency [a]	Target frequency [b]	
Interlingual Homographs (IHG) (N=39)	4.48 (1.04)	4.18 (2.44)	1.51 (0.78)	15035 (10669)	
Real Word Fillers (RW) (N=78)	4.48 (1.04)	4.18 (2.41)	1.50 (0.72)	14037 (10247)	
			1.50 (0.83)	12725 (10575)	
Nonsense Words (NW) (N=156)	4.48 (1.04)	4.18 (2.41)	N/ A	13017 (9194)	14410 (10136)
				14735 (10359)	14821 (10498)

[a] Mean frequency per million of test and corresponding control targets, using the German log frequency in the CELEX database (Baayen et al 1993).
[b] Mean frequency per million of test and corresponding control targets, using the German bigram frequency in the CELEX database (Baayen et al 1993)

2.2.2 Sentence frames

With stimulus selection completed, two sets of English sentence frames were created for each IHG, one for each control RW and one for each NW. This gave a total of 312 English sentence frames. Each English sentence frame was then translated into German, resulting in 312 German sentence frames. All sentence frames had a relatively open context with no obvious bias towards the target word meaning. With respect to the critical IHG stimuli, this means that there was no bias towards either (English or German) meaning. Finally, all English sentence frames were recorded by a native speaker of New Zealand English, and all German sentences were recorded by a native speaker of German. Two presentation lists were constructed, each containing all 312 target words or nonwords. In each presentation list half the sentence frames were in English, and half in German, rotated across lists so that if a target IHG, RW or NW was preceded by an English sentence in one list then it was

preceded by a German sentence in the other list. Within each presentation list, the targets with English and German context sentences were presented in separate sublists (ie a block of 156 English sentences and a block of 156 German sentences). These sublists were presented in separate experimental sessions one week apart. Half of the participants were exposed to the sublist with the English context sentences in the first week, and to the sublist with the German context sentences in the second week. This order of sublists was reversed for the other participants. This ensured that participants never heard the same sentence in both languages in a single session, or twice in the same language across the two sessions (see Table 2 below).

The two sublists presented to any participant included the same set of 39 critical IHG words. Each sublist had a different set of 39 matching control RWs, and a different (but matching) set of 78 NWs. All sentence frames included were unique across the two sublists (except that for any one sentence frame there was a translation equivalent of that sentence frame in the other sublist). The stimuli in each sublist were divided in six blocks, each containing 26 trials. Each block ended with a memory task (explained below) which was meant to ensure that subjects paid attention to the sentences and did not exclusively focus on the lexical decision task. The order of the six blocks was kept constant because of the limitations outlined in the following paragraph.

Participants were required to attend two sessions of approximately thirty minutes each. As explained above, in the first session participants heard sentence frames in only one of the two languages (eg English; cf Table 2). During the second experimental session, they then heard sentence frames in the other language. To control for a possible language effect, half of the participants listened to English sentences in their first session and German sentences in the second session, and the other half listened to German sentences first and English sentences in the following week's session. Stimulus order within the sessions was kept constant, so that effects of sequential order within a session (eg practice or fatigue effects) would be likely to affect each language condition equally.

Participants within each proficiency level were also allocated randomly but evenly to one of two format conditions, which related to the presentation format of the visually-presented target word. The target was either entirely in lower case, or with the first letter capitalised (referred to in this paper as Title case). For example, after the spoken fragment *The woman listened to a radio show about the perfect* the target would be either *gift* (lower case) or *Gift* (title case). The target format remained constant across both sessions for each participant. Table 2 below illustrates the resulting conditions.

Table 2
Examples of stimuli materials by condition for presentation format (Title; lower), presentation order (English sentence; German sentence), and final target item
(The use of bold and normal font for the auditory sentence primes indicates the pairing of sentences across sublists: eg Sentence 1 for HOSE in English in one sublist is paired with Sentence 2 in German in the other sublist)

Condition(s)			Prime	Target
Item Type	Item Format	Sentence Language	(auditory sentence frame)	(final word)
Interlingual Homograph	Title Case		*Sentence 1 and its translation, for the target HOSE (= 'trousers' in German)*	Hose
		ENG	**Tim's shopping list included a barbecue and a**	
		GER	Auf Timms Einkaufsliste stand Grill und	
			Sentence 2 and its translation, for the target HOSE (= 'trousers' in German)	Hose
		GER	**Der Arbeiter verließ das Haus ohne**	
		ENG	The worker left the house without the	
	lower case		*Sentence 1 and its translation, for the target GIFT (= 'poison' in German)*	gift
		ENG	**The woman listened to a radio show about the perfect**	
		GER	Die Frau hörte im Radio eine Sendung über das perfekte	
			Sentence 2 and its translation, for the target GIFT (= 'poison' in German)	gift
		GER	**Er dachte an den Keller als das beste Versteck für das**	
		ENG	He thought of the cellar as the best hideout for the	
Real Word (German)	Title Case	**ENG**	**The aunt looked in her bag for the small**	Kamm
		GER	Die Tante suchte in ihrer Handtasche nach dem kleinen	
	lower case	**GER**	**Alexander asked his neighbour for**	mehl
		ENG	Alexander bat seinen Nachbarn um	
Nonword	Title Case	**ENG**	**The people loved the goofy**	Arin
		GER	Alle liebten den albernen	
	lower case	**GER**	**The examiner carefully studied the**	nark
		ENG	Der Prüfer untersuchte sorgsam die	

2.3 Procedure

Participants were first asked to read all instructions for the experiment on the computer screen. After a short practice session, the actual test began. A trial started off by presenting an empty screen for 2500ms, a time lapse which functioned as an inter-trial interval. Immediately after that participants heard a sentence fragment over the headphones. When the sentence fragment ended, a fixation cross appeared on the empty screen. After 200ms, the fixation cross was replaced by the potential sentence-final word, ie the target, in either all lower case letters or with the first letter capitalised. The participant's task was to decide as quickly as possible whether the

word presented on screen was an existing German word, and to indicate this response by pressing one of two keys (labelled Yes and No) on a button box with millisecond timing accuracy. They were timed-out after 3000ms if they had made no response, and the next trial was started. The experiment was run in E-Prime (Schneider, Eschman et al 2002; Schneider, Eschman et al 2002) on a Windows personal computer. Different response button configurations were selected depending on whether the participant was left- or right-handed, so that every participant used their dominant hand to indicate a 'Yes' response. Between trials participants rested the index finger of each hand over the response buttons.

Participants were tested individually. To keep the entire experiment as stable as possible, the same native German-speaking researcher conducted all sessions, and the procedure was exactly the same for all participants. The lexical decision task lasted no more than 25 minutes and was presented in six blocks, as described above. At the end of each block, a memory recall task was performed which included three sentences that were previously heard over the headphones and three sentences that were not heard anywhere during the experiment. Participants were presented with these sentences on screen, including their final word, and were asked to decide whether each sentence was included in the block they had just been exposed to (ie as a combination of a spoken sentence fragment and a single completing word). This was done to ensure that subjects paid attention to the sentences and did not exclusively focus on the lexical decision task.

After the second experimental session, subjects carried out a German proficiency test, filled in a language history questionnaire, and were asked to give the English meanings of the German words represented by the IHGs in the experiment (eg for 'Hose' a correct response would be 'trousers'). The entire experimental procedure, that is both sessions, was completed in approximately 60 minutes (roughly 30 minutes per session).

2.4 Data analysis and results

Prior to data analysis, two participants had to be excluded since they did not follow the given instructions, and one further participant had to be excluded due to a high overall error rate (greater than 50%). This left data from 62 participants. Further data cleaning procedures included the exclusion of three critical IHG words and four control RWs. The three IHGs were excluded because they were not known to the majority of participants. The RWs were excluded either due to participants' high error percentage on these particular items, or because they could have been read as English words. Finally, the assignment to a particular 'proficiency' (100-, 200- or 300-) level was adjusted for three participants, after taking into account the data from their responses to the questionnaire about German language exposure and experience.

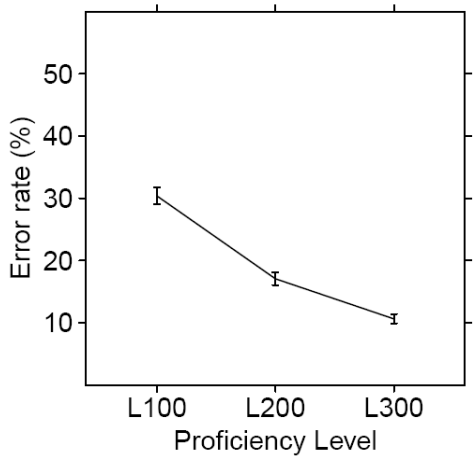
The analysis below first presents overall statistical results for error rates and for response times, before exploring effects within each level of participant proficiency, motivated by the interactions involving the Proficiency Level factor.

Four-way mixed effects ANOVAs were performed for the remaining data, for error rates (ie responding that a German word – either a RW or an IHG – was a nonword and vice versa) and for reaction times. The results of the ANOVA can be seen in the following set of graphs (Graphs 1–4). In the participant analysis, Sentence Language, Item Type and Proficiency Level were treated as within-participant factors, and Item Format as a between-participant factor. In the item analysis, Sentence Language, Item Format and Proficiency Level were treated as within-item factors, and Item Type as a between-item factor. Please note that although both subject and item ANOVAs were performed, only the latter will be discussed, due to space limitations.

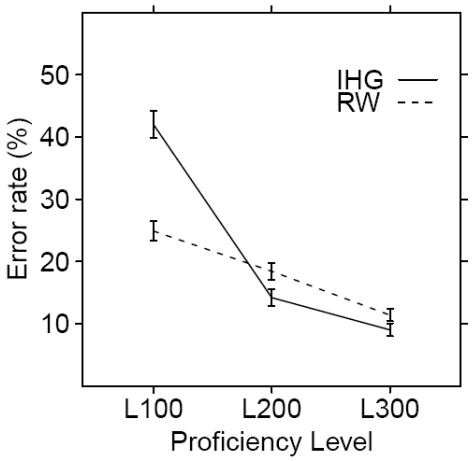
Error rates were analysed separately for incorrect 'nonword' responses to real words (IHGs and RWs combined) and for incorrect 'word' responses to nonsense words (NWs). Both analyses revealed Proficiency Level as a strong overall effect – real words, $F(2,208) = 89.48$, $p < 0.001$; nonwords, $F(2,310) = 380.52$, $p < 0.001$ – with lower proficiency subjects making more incorrect responses to both real word and nonsense stimuli than their more proficient counterparts (see Graph 1). Proficiency Level was also involved in many interactions, such as in two-way interactions with Item Type (only possible for real words, since there is only one type of nonsense word, $F(2,208) = 26.87$, $p < 0.001$); with Item Format (real words, $F(2,208) = 3.83$, $p < 0.03$; nonwords, $F(2,310) = 42.10$, $p < 0.001$); and with Sentence Language (significant only in the nonword analysis, $F(2,310) = 4.52$, $p < 0.02$). Proficiency Level was also involved in a significant three-way interaction with Sentence Language and Item Format (real words, $F(2,208) = 6.03$, $p < 0.005$; nonwords, $F(2,310) = 3.53$, $p < 0.04$), and a marginally significant four-way interaction with Sentence Language, Item Type and Item Format (for real words only, $F(2,208) = 2.85$, $p = 0.06$).

Separate response time analyses were also carried out for correct responses to real words (IHGs and RWs, including an Item Type comparison between these two) and for correct responses to nonsense words (NWs). These analyses were separated because correct responses to real words and correct responses to nonsense words involved different decision outcomes ('yes' and 'no' respectively) and required different button presses using different (dominant and non-dominant) hands. Proficiency Level again showed a strong overall effect, for both real words – $F(2,208) = 237.67$, $p < 0.001$ – and nonwords – $F(2,310) = 253.40$, $p < 0.001$ – and with increasingly faster responses to items as participants' proficiency increased. Proficiency Level was also significantly involved in a two-way interaction with Item Format – real words, $F(2,208) = 4.60$, $p < 0.01$; nonwords, $F(2,310) = 20.36$, $p < 0.001$ – and a three-way interaction between Sentence Language and Item Format for nonwords only: $F(2,310) = 4.73$, $p < 0.009$. Response time data also revealed a strong overall effect of Item Format, for both real words – $F(1,104) = 64.95$, $p < 0.001$ – and nonwords – $F(1,155) = 175.02$, $p < 0.001$ – and its involvement in further interactions (including those already mentioned), namely with Item Type – note that this analysis is only possible for the real word contrast of IHGs and RWs: $F(1,104) = 7.43$, $p < 0.007$ – and with Sentence Language (real words, $F(1,104) = 22.08$, $p < 0.001$; nonwords, $F(1,155) = 17.69$, $p < 0.001$). The main effect of Item Type, which can only be tested for the IHG/ RW contrast in real words, was marginally significant: $F(1,104) = 3.51$, $p = 0.06$.

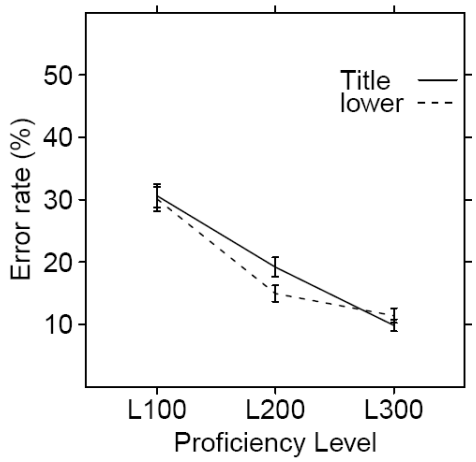
Graph 1
Mean incorrect responses to German real words (RWs and IHGs combined), across three proficiency levels.



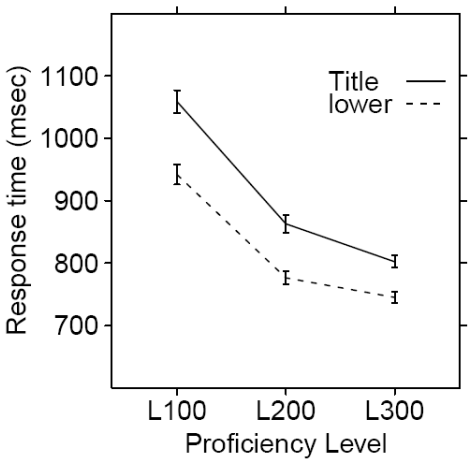
Graph 2
Mean incorrect responses to Interlingual Homographs vs. Real Word targets, across three proficiency levels.



Graph 3
Mean incorrect responses to German real word targets (RWs and IHGs combined), in Title vs. lower case, across three proficiency levels.



Graph 4
Mean latencies to German real word targets (IHGs and RWs combined) presented in Title vs. lower case at three different proficiency levels.



Based on the main effects and interactions found for Proficiency Level in the above analyses, separate error and RT analysis were carried out for each of the three proficiency levels (see below).

2.5 Error analysis

Recall that the overall error analysis for real words showed a main effect for Proficiency Level and an interaction of this with Item Type (RW vs IHG). Graph 2 shows that increasing proficiency results in a decrease in error rates for real words, and that this effect is greater for interlingual homographs (IHGs).

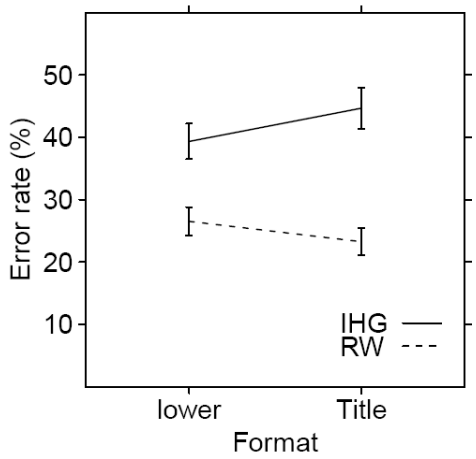
Proficiency Level also interacted with Item Format in the main analysis for both real words and nonsense words (see Graphs 3 and 4). In a separate analysis for the lower proficiency level (100) it was found that Item Format interacts with Item Type (for real words, $F(1,104) = 4.47$, $p < 0.03$), reflecting an increase in incorrect responses to

IHGs with Title case (see Graph 5). Interestingly, these participants also make considerably more errors on nonwords presented in Title case ($F(1,155) = 22.30$, $p < 0.001$), particularly after English context sentences; the Sentence Language by Item Format was significant for errors on nonwords at 100-level: $F(1,155) = 5.23$, $p < 0.02$ (see Graph 6).

In the separate analysis of data from 200-level participants, Item Format interacts with Sentence Language (real words, $F(1,104) = 6.12$, $p < 0.01$). This interaction comes about because although error rates are not affected by Item Format after German contexts, presentation of a German word (noun) with an initial capital reduces the error rate after English contexts (see Graph 7). In contrast, when confronted with nonwords in Title (German-like) case, these participants are more likely to respond that the stimulus is a word ($F(1,155) = 86.99$, $p < 0.001$; see Graph 8).

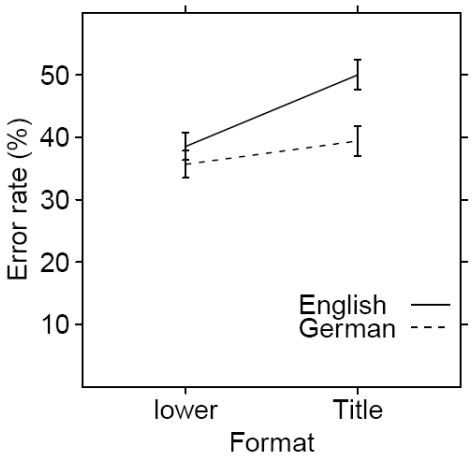
Graph 5

Mean incorrect responses to lower vs. Title case presentations of Interlingual Homographs and Real Words, for 100-level participants.



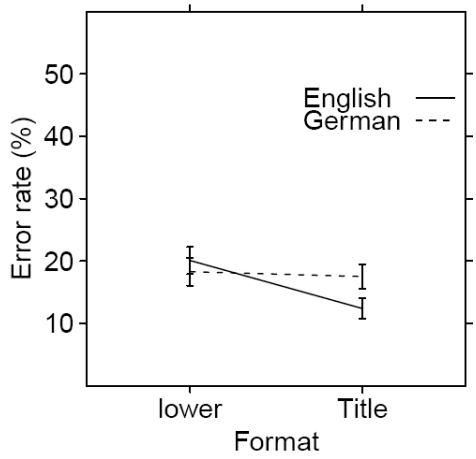
Graph 6

Mean incorrect responses to lower vs. Title case nonwords after English and German context sentences, for 100-level participants.



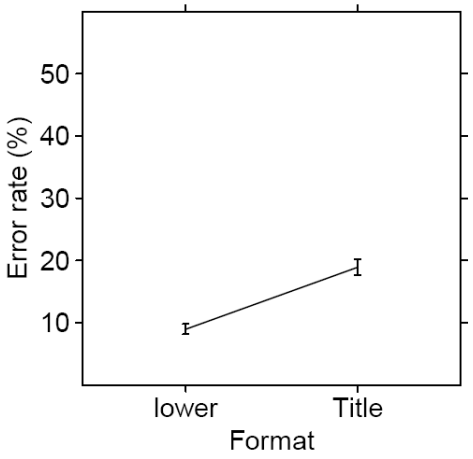
Graph 7

Mean incorrect responses after English and German context sentences, for lower vs. Title case targets, for 200-level participants.



Graph 8

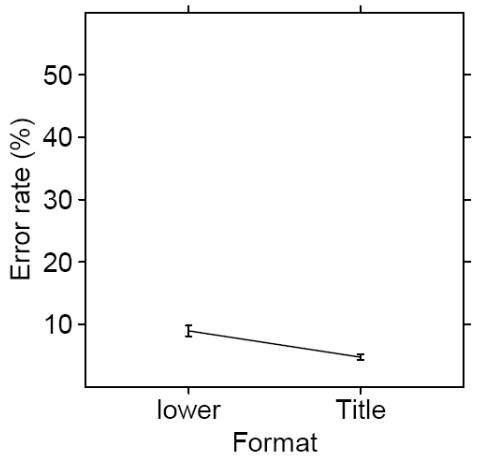
Mean incorrect responses to lower vs. Title case nonword targets, for 200-level participants.



Finally, data from 300-level participants show no main effects and no interactions of any factors in the analysis of real word errors; the only conventionally significant effect is for Item Format for errors to nonwords ($F(1,155) = 25.17$, $p < 0.001$; see Graph 9). Also noticeable is that error rates to the lower case items are similar to those observed for the 200-level participants above – what has changed is that there are now many fewer errors to the Title case items, even though the Item Format difference is still significant.

Graph 9

Mean incorrect responses to lower vs. Title case nonword targets, for 300-level participants.

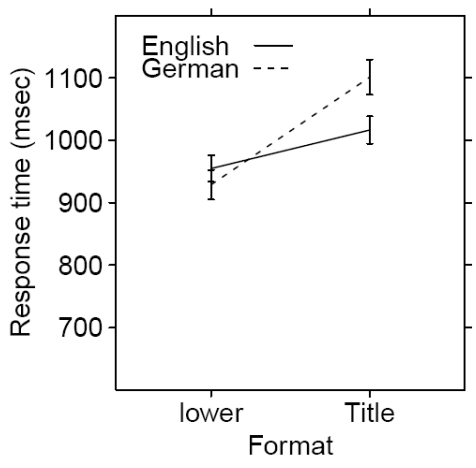


2.6 RT analysis

A general observation which can be made from looking at the response latencies (see Graphs 10-12), and which has been confirmed by statistical analyses, is that correct responses to real words are faster across all proficiency levels for lower case (for 100-level, $F(1,104) = 24.86$, $p < 0.001$; for 200-level, $F(1,104) = 45.19$, $p < 0.001$; for 300-level, $F(1,104) = 19.46$, $p < 0.001$).

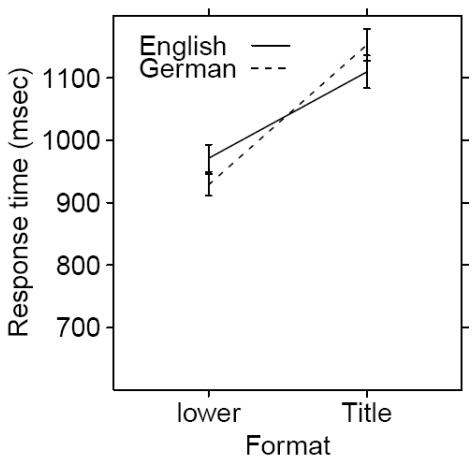
Graph 10

Mean response times to lower vs. Title case targets, after English and German context sentences, for 100-level participants

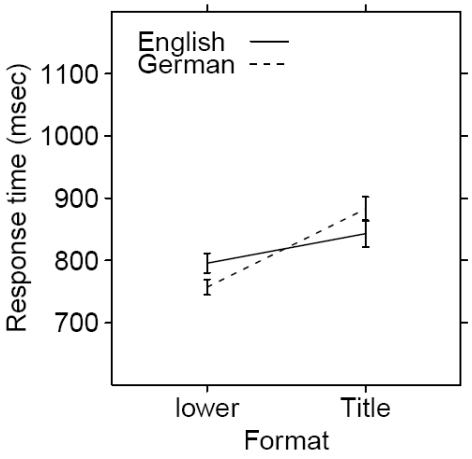


Graph 13

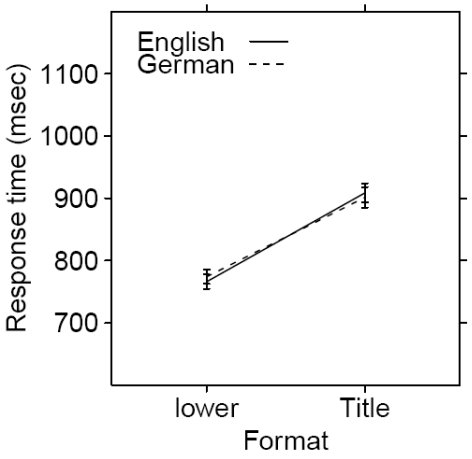
Mean response times to lower vs. Title case nonwords, after English and German context sentences, for 100-level participants



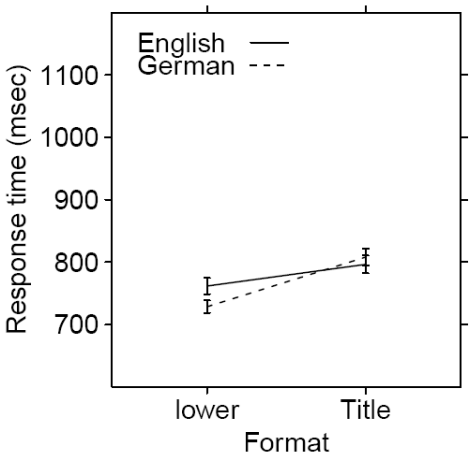
Graph 11
As above, for 200-level participants



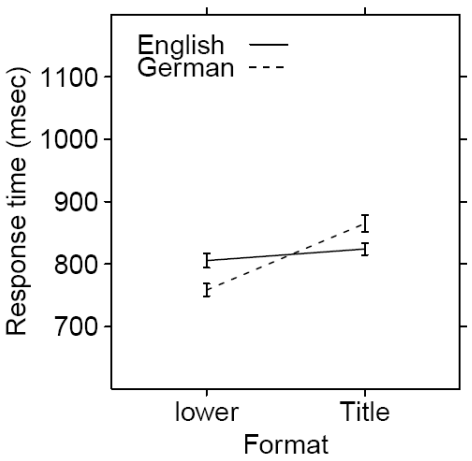
Graph 14
As above, for 200-level participants



Graph 12
As above, for 300-level participants



Graph 15
As above, for 300-level participants



Interestingly, the Item Format difference is consistently stronger in the German context across all levels (for 100-level, $F(1,104) = 10.39$, $p < 0.001$; for 200-level, $F(1,104) = 8.89$, $p < 0.003$; for 300-level, $F(1,104) = 4.70$, $p < 0.03$; Graphs 10-12). In addition, Item Type interacts with Item Format for low proficiency (100-level) participants ($F(1,104) = 6.46$, $p < 0.01$). That is, whereas response times to interlingual homographs are not affected by Item Format, presentation of a real German word with an onset capital reduces the speed with which the subjects can respond to it. A further observation is that the more proficient participants recognise interlingual homographs more rapidly than real German words (for 200-level, $F(1,104) = 6.81$, $p < 0.01$; for 300-level, $F(1,104) = 3.29$, $p = 0.07$).

As with real word responses, response times for correct rejections of nonwords show a significant Item Format effect across all proficiency levels (see Graphs 13-15), with Title case taking longer to reject (for 100-level, $F(1,155) = 63.83$, $p < 0.001$; for 200-level, $F(1,155) = 156.35$, $p < 0.001$; for 300-level, $F(1,155) = 52.74$, $p < 0.001$). At 100- and 300-level the Item Format effect interacted with Sentence Language (for 100-level, $F(1,155) = 5.85$, $p < 0.01$; for 300-level, $F(1,155) = 19.49$, $p < 0.001$), reflecting the

fact that it took these participants longer to reject nonsense words in Title case following German sentence primes (compare the two lines in Graphs 13 and 15).

3. Discussion

3.1 Error analysis

In line with expectations, the results presented above indicate that with increasing proficiency level, language-specific cues seem to have a stronger impact on visual word recognition processes, ie increasingly facilitating correct responses to real word items as well as correct rejections of nonwords. Another finding is that lower proficiency L2 speakers are more strongly influenced by their L1 vocabulary in making an L2 lexical decision response. This is shown in the data with participants with little exposure to German being more inclined to reject interlingual homographs as not being German words. This tendency becomes even stronger when these IHGs are presented with an onset capital letter. Interestingly, this problem does not arise with correct responses to matched controls (RWs), which also have the first letter capitalised. In addition, the same participants have more difficulties rejecting nonwords which have the first letter capitalised. This result is somewhat surprising, since our general expectation would be that onset capitalisation should facilitate the recognition of German words. One interpretation for the observed results is that low proficiency learners are not completely oblivious to (noun) capitalisation in German; they are simply being misled by the experimental requirements. Particularly with respect to nonsense words, this means that something unknown, but German-like in its spelling, is frequently reported as a German word. Another interpretation of the findings is that IHGs can be expected to remain stored as two separate entries with rather weak (if any) connections between the two languages. This interpretation would imply a developmental pattern of bilingual lexical organisation, with the two languages becoming increasingly separated.

In contrast, slightly more advanced bilinguals (our 200-level participants) show less L1 interference when responding to real words in the L2 (German). This is primarily reflected in the absence of a main effect distinguishing IHGs and matched RWs, and of any interactions involving this Item Type factor. A finding that is more in line with our expectations outlined above is that these participants' responses are affected by Item Format in a facilitatory manner. This is reflected in the interaction with contextual support. Whereas errors after German contexts are not affected by onset capitalisation, the particular format of stimulus presentation affects peoples' responses after English contexts; that is, it reduces the error rate. This result can only be explained by assuming that specific language cues can indeed set up a particular language mode, thereby facilitating real word responses. As was observed for low proficiency learners, slightly more advanced participants (200-level) are more prone to incorrectly accept as real words those German nonwords which are presented with the first letter capitalised. Again, this supports our view of language cues

having a strong impact on cognitive processing; in this case resulting in an inhibitory rather than facilitatory effect.

Finally, the error rate data for 300-level students do not reveal any main effects or interactions except for one: subjects make more errors when they have to reject a nonsense item with an onset capital. This is also observed with lower proficiency groups. Thus, the highly proficient participant group is clearly not being misled by the experimental factors to nearly the same extent as the less advanced learners; however what is evident is that all subjects are influenced by the fact that Title case marks nouns in German. Notably, the evident absence of a Sentence Language effect with increasing proficiency level is compatible with the idea that language-specific cues are processed bottom-up and largely independently of top-down cues from the context language or from the lexicon.

3.2 RT analysis

The response time analyses revealed a strikingly consistent response pattern across all three proficiency levels. This pattern occurs in both correct responses to real word items and correct rejections of nonwords. First, participants at all levels are slowed down when responding to German-biased items, ie those presented with an onset capital (although overall mean response times decrease significantly with increasing proficiency levels). This observation is confirmed statistically as a persistent effect of Item Format. A possible explanation of this response delay is that there is an additional consistency verification involved for an accessed German word, to ensure that the word is a noun (which requires capitalisation).[2] This conjecture seems to be supported by the second observation, namely that responses are more rapid when items appear after a German context and all in lower case. This is reflected in the statistical analysis as an interaction of Item Format and Sentence Language.

One final conventionally significant effect from the real word data is the Item Type effect. More specifically, IHGs are accepted more rapidly than their matched RW controls. Notably, this effect is also be found separately for 300- and 200-level participants, but not for 100-level, so it seems to be something that is connected to increasing proficiency. In line with previous research (Dijkstra, Timmermans et al 2000), this finding can be interpreted as a gradual cumulative effect of the bilinguals' two languages.

4. Conclusion

Embedding the findings presented above in the current research literature, we find that they not only further support common concepts and understanding of bilingual VWR, but also provide new insights into cognitive processes of a bilingual speaker.

[2] Please note that due to experimental restrictions not all real word items were nouns.

Addressing the question of the extent to which (sub-) lexical information can facilitate or inhibit bilingual VWR, recent research conducted by Vaid and Frenck-Mestre (2002) suggests that bilinguals make use of certain language cues. The experimenters presented to their French-English subjects words that were either marked or unmarked for either L1 (French) or L2 (English) on the basis of digram frequency (eg OEUF for French, and KICK for English). The subjects' task was to decide which of these two languages the presented item belonged to. Participants' responses were faster for orthographically marked than unmarked words, particularly in the second language (English). The researchers interpreted these results in favour of a perceptual search strategy. That is, the recognition of orthographically marked words was facilitated because the late bilingual subjects (ie those who had learned English after the age of 12) employed bottom-up cues. We addressed this finding in the current research by investigating the role played by language-specific cues (in the form of onset capitals indicating German words) in English-German bilinguals' VWR. Our findings, based on error analyses, confirmed the previously observed facilitatory effects of language-specific cues on lexical access. However, we also extended the previous investigation by taking a related question into account, ie what effects might L2 proficiency have on the manifestation of facilitatory versus inhibitory dynamics? Interestingly, the effects reported above were more likely to be observed with more proficient bilinguals than their less bilingual counterparts. This finding is not surprising and does not contradict our expectations. Taken together with the evidence that language-specific cues are processed bottom-up and largely independently of the context language or the lexicon (as reflected in decreasing context language effects as proficiency level increases), the findings could also be interpreted in line with the BIA+ (Dijkstra and Van Heuven 2002) model. As explained above, the model assumes a gradual activation of sub-lexical, lexical, and conceptual levels during visual word recognition. The model also proposes a language tag/ node which can facilitate language selection. Let us assume that the sub-lexical level – and thus language-specific cues – is connected to a specific language tag or node. When confronted with an onset capital, a high proficiency learner might make quick use of a connection of this format to a particular language tag, informing him/ her about the language being processed and selected from; ie facilitating responses. A less proficient learner might not yet have established that connection, due to lower exposure to the L2 as well as a smaller vocabulary size. This would explain the facilitatory effect of language-specific cues being strongest for high proficiency learners.

It needs to be noted at this stage, however, that in contrast to our error rate results, response latencies across all levels revealed a delay for items marked 'German' (ie with an onset capital). We believe that this delay should not be read as an inhibitory effect. A more reasonable explanation of this delay is that there is an additional stage of consistency verification involved for an accessed German word, to ensure that the word is a noun, since only nouns require capitalisation. This conjecture is supported by the absence of any evident language context effect. That is, after German contexts, items presented in lower case were of all conditions the fastest responded to; however, items presented with an onset capital showed the reverse effect, ie being responded to the slowest of all conditions. This result does not allow for a clear-cut elaboration of the extent to which a bilingual can either use or discard sub-lexical

information in specific language contexts, or whether this information is sufficient to constrain (if not eliminate) lexical interaction between the bilingual's languages.

In line with this research direction, Libben and Titone (2009) have recently confirmed well-established claims made within monolingual word recognition research, arguing that bilingual lexical access at early stages of comprehension (ie bottom-up effects) is non-selective, but that selection from accessed words is rapidly resolved in semantically biased contexts at later stages of comprehension (ie top-down effects). Their claim was based on the lack of evidence of cognate facilitation or interlingual homograph interference for late-stage eye movement measures, but the opposite effect for early-stage comprehension measures. Considering our own results – on the one hand, error data suggest that sentence context is irrelevant to the processes involved in VWR, at least for more proficient speakers. On the other hand, response time data indicate a potential consistency verification process. This process would not and does not support fast responses in the most favourable and expected condition (ie to an item with an onset capital, embedded in a German context). Finally, the task has been performed in the participants' weaker L2 and it is possible that the specific language information is just not as readily available or of direct use to an L2 speaker.

Thus, not only is it important that future research directions address questions of the role of sub-lexical and/ or language-specific information, as well as proficiency level on visual lexical recognition processes, but also that more naturalistic experimental designs should evolve. Current research underway by the first author seeks to address some of the unresolved issues above and further confirm the recent findings by collecting data from German-English bilinguals.

Appendix: List of experimental items

Interlingual Homograph (IHG)	**Control Filler** (week one and week two)	
ALTER*	stein	karte
BAD	mut	arm
BALD*	wahr	dank
BITTEN*	stelle	nennen
BRIEF*	liebe	natur
CHEF*	knie	ewig
DOSE*	mehl	kamm
FASTEN*	ketten	rocken
GENIE	herab	busch
GIFT*	egal	sekt
GUT*	bis	was
HALL*	tote	nase
HANDY*	grund	punkt
HELL	hals	haut
HERD*	heim	heer
HERB*	kern	edel
HOSE*	tanz	topf
HUT*	los	lok
KIND*	dort	hoch
LIST*	faul	sofa
MADE	lamm	rahm
MIST*	ober	oase
MODE*	kauf	mord
MUSTER*	bitter	kochen
MUTTER*	fehlen	kosten
NOTE	sand	bier
NUN*	mai	uhr
RAT*	tor	rad
RATE	farm	wehr
ROMAN*	stoff	vogel
SAGE*	rost	maus
SMOKING*	frostig	dreckig
STERN*	fisch	kunde
STILL	braun	miete
STRAND*	nachts	teufel
TAG*	bau	all
TASTE*	beige	tanne
TELLER	kuchen	trauen
TOLL	zoll	matt

* Items used by Elston-Güttler and colleagues (2005).

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