

SLA

Second  
Language  
Acquisition

# Effects of the Second Language on the First

Edited by  
**Vivian Cook**

## Chapter 10

# **Effects of the L2 on the Syntactic Processing of the L1**

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### **Introduction**

Not only second language acquisition researchers but also linguists have tended to treat the monolingual native speaker as the norm and to see the L2 user as an approximation to a native speaker. In this view the first language of someone who speaks a second language holds no particular interest. However, in the multi-competence view, at some level the languages form a complex single system in one mind, of which the first language forms part (Cook, 2002). Until this volume, the effects of the second language on the first language have rarely been documented. The two exceptions are Kecskes (1998) who found a beneficial effect on the development and use of mother tongue skills with regard to structural well-formedness in Hungarian students of modern languages, and Balcom (1995) who found different acceptability judgements of French passive sentences in Francophone speakers who did or did not know English.

This chapter adds to these studies by approaching syntactic processing through the Competition Model research paradigm concerning how people assign the subject to the sentence (Bates & MacWhinney, 1981). The question is whether the L2 users' processing of L1 syntax differs from that of monolingual speakers in some respect. The litmus test is whether there are differences in the first language of monolinguals and of L2 users who know another language.

### **The Competition Model Research Paradigm**

In the Competition Model (Bates & MacWhinney, 1981), sentence processing depends on the weight given to competing factors in a particular language. The standard example is deciding which noun is the subject of the sentence. This depends on the varying balance between cues in



different languages. *Mr Bean* is the subject in *Mr Bean loves Teddy*, mainly because it comes before the verb *loves* and the object *Teddy*: word order is the main cue in English. But *Mr Bean* is not only first in the sentence but is also animate, nominative and in agreement with the verb, all of which in other languages are more vital cues than word order.

Hence the standard experimental task used in the Competition Model systematically varies the cues for the subject of the sentence. The subjects are presented with sentences with a range of possible cues, unnatural as some may seem in a particular language, so that the weighting for the cues can be established. An English person has, say, to choose between word order and agreement in deciding the subjects of *The Teddies loves Mr Bean* or *Mr Bean love the Teddies*.

Among the cues whose weighting varies between languages are:

*Word order*: The subject has to occur in a definite position in the sentence, say first in SVO (Subject-Verb-Object) languages such as English or second in VSO languages such as Arabic. Thus speakers of English identify *people* as the subject of *People like Jaffa-cakes* because it is the first N. (Though the subjects of test sentences are often phrases rather than words, in this research paradigm they are referred to as N rather than NP, the usage to be followed here.)

*Animacy*: The subject has to be animate rather than inanimate. So in a sentence such as *Jaffa-cakes like people*, speakers of languages with strong animacy cues (such as Japanese or Italian), prefer the animate second N *people* as the subject in their equivalent L1 sentences.

*Case*: The subject has to be in the subjective (nominative) case, as in *Amor vincit omnia* where *Amor* is in the Latin subjective case. In languages with strong case cues, speakers choose the second N *Jaffa-cakes* in a sentence such as *John likes Jaffa-cakes* (subjective), thus overriding the order and agreement cues. English uses case minimally for deciding the subject with regard to pronouns *I/me, they/them*, etc.

*Agreement*: The subject may agree with the Verb in number, whether plural or singular, *John likes Jaffa-cakes* versus *John and Mary like Jaffa-cakes*, or in gender. Languages where the agreement cue is very strong treat *Jaffa-cakes likes John* as having the subject *John*.

As the examples show, finding the subject of the sentence is not a matter of either/or but of the relative strength of particular cues. While English may be dominated by word order, there are still enough traces of agreement and of case to enable us to identify the subjects in *Where the bee sucks there suck I* or *In my beginning is my end*.

### **The Competition Model and the L2 User**

With few exceptions, L2 research in the Competition Model has looked at the extent to which the L2 weightings for the subject cues carry over those from the first language. Harrington (1987) established that Japanese L2 users of English had gone some way to adopting the English reliance on word order in Noun-Verb-Noun (NVN) English sentences, but not in VNN or NNV sentences, and, though prepared to allow inanimate subjects to some extent, they still preferred animate subjects as much in English as in Japanese. Hence their processing of the L2 English has moved some way towards the weightings of the language in question but is still heavily influenced by their L1 Japanese. Kilborn and Cooreman (1987) looked at the processing of L2 English by Dutch L1 speakers and found a lesser reliance on word order and a greater reliance on agreement than for native English speakers. Other research has shown the importance of animacy for English and Turkish learners of Dutch (Issidorides & Hulstijn, 1992) and of morphology for Dutch learners of English (McDonald, 1987).

Research with effects of the second language on the first language is less extensive. Liu, Bates and Li (1992) found some 'backward' transfer in Chinese speakers learning English in the United States, affected non-monotonically by age (effects for under-4s and 12–16 year olds but not for 6–10 year olds and late bilinguals) and by family use. Su (2001) found that advanced Chinese learners of English used the same strategies in both languages. Their Chinese processes were influenced by English, though this was not true of lower-level learners, nor of English speakers learning Chinese, summed up as 'There was little evidence indicating that the learners' knowledge of the second language was influencing their processing of the first language, except in the advanced subjects' (Su, 2001: 106).

The Competition Model technique thus provides a clear-cut way of measuring differences between L2 users and monolinguals across languages that is neutral about direction of transfer between first language and second language (Su, 2001) as it involves a unitary model of mind close to connectionism (MacWhinney, 1997). The research here was not conceived as a contribution to the Competition Model itself so much as a use of the technique as a tool to test for differences in the L1 between monolinguals and L2 users. The Competition Model paradigm is useful because it applies cross-linguistically, uses a relatively simple design with clear-cut data, and has been tried across several first and second languages.



### The Common Core to the Experiment

The aim was to run a version of the classic Competition Model experiment (Bates & MacWhinney, 1981) in a range of languages, using the same instructions and equivalent materials. Two groups of people would be tested in each language; one would have English as a second language, the other would not. The hypothesis is that the L2 users would be influenced by the cues of the second language in the processing of their first language. The languages to which easy access could be obtained were Japanese, Spanish, Greek and English, each spoken as first languages by one of the present writers.

English was kept as the sole second language to control one possible variable: it would be difficult to compare, say, the results of learning Spanish as a second language for Japanese speakers with learning Russian as a second language for French speakers. Because of the international nature of English, it was hard to find people with zero English. Furthermore, the differing goals and success of English teaching in different countries meant that it was hard to establish whether all the subjects had the same level of English proficiency. Hence the decision was made to standardise the 'minus L2 factor' as minimal rather than zero English and the 'plus L2 factor' as students of English at university level. Indeed, given the high proportion of people in the world who use more than one language, much research now finds it difficult to get 'pure' monolinguals and has to be content with 'minimal bilinguals'.

### Relevant Characteristics of the Four Languages

#### Japanese

##### *Word order/sentence structure*

While Japanese word order is typically SOV, sentences are quite flexible; order depends more on the context than on the fixed structure itself (Nakajima, 1987).

##### *Animacy*

Animate subjects are preferred as 'action doers'. However Japanese tends to prefer a *static* description of a certain situation or fact, rather than using a *dynamic* structure of a subject as the action-doer followed by the action-verb as in English (Nakajima, 1987).

##### *Case*

Japanese nouns do not inflect for case. There is nevertheless a system of case particles that mark particular functions. Two main particles, *ga* and *wa*,

which follow the subject N (as postpositions), mark 'subjective case'. While *ga* introduces new/unknown information:

Neko-ga nezumi-wo oikakeru.

'It's cats (not other animals) who chase mice.'

cats (new inf.) mice (obj) chase (V)

*wa* marks the topic of the sentence:

Neko-wa nezumi-wo oikakeru.

'As for cats, (they) chase mice.'

cats (topic) mice (obj) chase (V)

#### Agreement

Japanese nouns are not inflected for number, but have a complex system of classifiers. Verbs are marked with the inflection *-u* in all persons of the present tense. Hence there is no agreement system for number.

#### Spanish

##### Word order

According to Comrie (1987: 253), Spanish has free or relatively free word order. In everyday language, object and complement always come after the verb in affirmative sentences:

Pedro compró un regalo.

'Peter bought a present.'

but VO/SVC order is preferred when the subject is a single proper noun or a short phrase. In formal registers VSO order is used with very long phrases, which follow the verb:

Ahora han llegado todos los pasajeros que viajaron con la Compañía X.

'All the passengers travelling with Company X have now arrived'

(Comrie, 1987: 254).

VS order is adopted for most subordinate clauses:

No presté atención a lo que estabas haciendo.

'I didn't pay attention to what you were doing.'

VS order also appears in existentials:

Viven gitanos en las cuevas.

'There are gypsies living in the caves.'

and it is used in questions that start with an interrogative word:



¿Qué estaba haciendo? .  
'What were you doing?'

#### Animacy

Animacy is involved in the selection of prepositions to mark direct objects, as we see below.

#### Case

According to Zamora (1999: 1), Spanish uses the preposition *a* ('to') to mark personal or affective direct objects, as in *querer a una persona* ('to love a person') and *querer a un gato* ('to love a cat'). It also uses *a* ('to') for direct object, as in *dar algo a alguien* ('to give something to somebody'). Full subject NPs are not themselves marked for case.

#### Agreement

Spanish marks number and gender on all modifiers within the noun phrase, and has concord of number and person (and occasionally gender) between the subject and verb (Comrie, 1987: 255). The verbal inflections show agreement through person and number: *comemos* ('we ate') presupposes a first person plural subject. Only when this is ambiguous does the position of the NP before the verb determine this function. For instance,

Los poblamientos humanos destruyen los bosques.  
'Human settlements destroy forests.'

would change subject from the reverse order:

Los bosques destruyen los poblamientos humanos.  
'The forests destroy human settlements.'

### Greek

#### Word order

While the typical Greek word order is SVO, other combinations are acceptable. For example as well as:

O Petros agorase ena doro  
'Peter bought a present.'

one could also say:

Ena doro agorase o Petros.  
'A present bought Peter.'

or:

Agorase ena doro o Petros.  
'Bought a present Peter.'

or:

Agorase o Petros ena doro.  
'Bought Peter a present.'

Greek word order is thus flexible, though the dominant word order is SVO.

#### *Animacy*

Both animate and inanimate subjects are acceptable, without restriction.

#### *Case*

Nouns are inflected for gender, number and case. The subject takes subjective case and the object takes accusative case. For example the ending *-os* in *Petros* shows that the word is masculine, singular and in the subjective case.

Number agreement: Greek verbs are inflected in all persons. The verb agrees with the subject in both number and person. For example the verb ending *-ω* (omega) presupposes a first person singular subject.

### **English**

#### *Word order*

English is an SVO language with the subject almost always coming first in the declarative sentence.

#### *Animacy*

Whether the Noun is animate or inanimate is not relevant in English to the choice of the subject.

#### *Case*

The only vestigial aspects of surface case in English that are relevant are the difference between the subjective and objective forms of pronouns, for example

They despise them.

#### *Number agreement.*

Only present tense verbs and auxiliaries have subject-agreement for number in English:

'He likes beer' vs. 'They like beer.'

Apart from English, all the languages involved in this experiment are



pro-drop, that is to say they allow sentences with null subjects. So a sentence such as *Speaks* would be grammatical in all of them except English. This has implications for the research methodology, since test sentences with pronouns present would be marked in these languages.

If the second language has an effect on the first language, people with two languages should use different cues in deciding the subject from those used by people with one language. The prediction is therefore that the strength of cues in L2 users will be influenced by the strength in English. We might expect, then, the dominance of word order in English to affect the case, animacy and agreement cues utilised in the other languages, though other unanticipated differences may emerge.

## Common Design and Materials

### Factors and sample sentences

All the 81 sentences in the materials consisted of three elements, two Noun Phrases (Ns) and a Verb (V). The vocabulary was selected from the set in Harrington (1987) and consisted of nine Verbs (such as *greet*), six Inanimate Nouns (such as *spoon*) and ten Animate Nouns (such as *pig*). The sentences were translated into each language using translation equivalents for these items (problems to be noted below).

Because of the differing combinations, the number of sentences for each type varied slightly and will be indicated below. Using the English version of the test sentences as the starting point, the separate factors tested were:

#### Word order

Three word orders were tested:

- (a) NVN: The dog pats the tree.
- (b) VNN: Watches the monkey the pen.
- (c) NNV: The horse the rock kisses.

The test sentences in the other languages are direct translations of these; in Japanese no singular inflection is required for the verb.

#### Animacy

Keeping to the NVN order for illustration, three possibilities for animacy were tested varying the combinations of animate and inanimate Ns:

- (a) N1 (animate)/V/N2 (inanimate): The bears kiss the tree.
- (b) N1 (inanimate)/V/N2 (animate): The pencil smells the giraffe.
- (c) N1 (animate)/V/N2 (animate): The dog pats the donkey.

### Case

Since English NPs do not have full surface case, the specification of Subjective case is indicated in brackets, keeping to the SVO and Animate/Animate examples. Where possible only the Subjective case was marked, not the Objective, to avoid providing double cues to the subject.

- (a) N1(Subj): The cow (Subj) pats the monkey.
- (b) N2(Subj): The dog eats the donkey (Subj).

To get parallel sentences in Spanish it was necessary to include a prepositional particle as in *A la tortuga la yegua saluda*, as we see below. To avoid the issue of null subject pronouns and the marked nature of subject pronouns in some languages, full NPs rather than pronouns were necessary throughout.

### Number (agreement)

Using SVO and Animate Noun examples for English, the types of sentence were:

- (a) N1(singular)/V/N2(plural): The turtle smells the bears.
- (b) N1(plural)/V/N2(singular): The dogs bites the monkey.

The verb in (a) therefore agreed with N1, the verb in (b) with N2.

### Language-specific factors

The main differences from the classic Competition Model paradigm were necessitated by the cross-lingual application of the instrument. Rather than each set of sentences being uniquely generated for each subject, they were decided in advance, since random collocations of vocabulary that work in English were unlikely to be successful across languages. Certain adaptations had to be made to make the experiment work in each language. The starting point was to attempt direct translations of the English sentences and then to make the minimal adjustments necessitated by the language in question.

## Japanese

### Case

Case particles are not included unless specified in the test condition, since information is retrievable from the context and NPs without particles are common in speech. When the subject case was called for, *wa* and *ga* were used as subject markers as appropriate.



*Agreement*

Plural nouns are indicated by adding *tachi*, but there is no inflectional agreement with the verb.

**Spanish***Gender*

Since all NPs in Spanish are marked for gender, translating the sentences exactly into Spanish would give undesired gender cues. Nouns had to be substituted in several sentences so that the same gender was used in both Ns in the sentence. For example:

Smells the pencil the giraffes.  
'Huele la lapicera ('pen') las jirafas.'

As there is no masculine Spanish translation for *giraffes*, the word for *pencil* was changed to the similar word for *pen*, which has feminine gender

*Object marking with prepositions*

Spanish transitive verbs may be followed by more than one objective complement (Gili Gaya, 1961: 208). They are followed by a direct object when they have only one complement, for example:

(a) Juan vio a María.  
'John saw Mary.'

and

(b) Juan compró una rosa.  
'John bought a rose.'

In (a) the direct object is preceded by the preposition *a* ('to') because direct objects in Spanish are preceded by the preposition *a* when animate, but not when inanimate as in (b). Conversely, we may speak about 'indirect objects' when transitive verbs are followed by two objective complements, for example:

El mozo trajo la cuenta a su cliente.  
'The waiter brought the bill to his customer.'

In this instance, the same rules apply to the indirect object.

If the prepositions were omitted from the Spanish sentences, the problems would be:

- (1) subjects might be reversed thus altering the original order in the English master sentences;
- (2) sentence ungrammaticality would lead to ambiguity;

thus drastically altering the original experimental design. Prepositions were therefore added before Objects, as in the following Spanish sentences, prepositions underlined.

A las jirafas muerde la osa.

'The giraffes bites the bear.'

Saludan los perros al caballo.

'Greet the dogs the horse.'

Mira a los tortugos el cigarrillo.

'Watches the turtle the cigarette.'

Additionally the Spanish verb *tirar* ('pull') must be followed by the preposition *de* ('de'), for example:

Tira de la cerda la vaca.

'Pulls the pig the cow.'

### Greek

#### Gender

Neuter nouns were used where possible to avoid any obviously inflected words, since in neuter nouns the subjective and accusative endings are the same. In many cases a word with a gender different from the direct translation equivalent was used to preserve the same gender and number in both Ns. For example in the sentence:

Smells the pencil the giraffes.

since the Greek word for *giraffe* is feminine, *pencil* (neutral) was changed to a similar feminine word *pena* (pen). In other cases we adopted a free translation for one of the two nouns in the sentence. For example the sentence:

The ball the donkeys watches.

became:

To topi ta gaidouria parakolouthi.

because the neuter word *to topi* ('the ball') keeps the gender constant.

### Subjects

The subjects were adults over 18 years old belonging either to a 'monolingual' non-university group with little English or to a 'bilingual' university group studying English in the respective countries (Japan, Greece and



Argentina) numbering 24 Japanese bilinguals, 21 Japanese monolinguals, 20 Spanish bilinguals, 20 Spanish monolinguals, 26 Greek monolinguals and 51 Greek bilinguals.

### Prediction

The overall prediction is then that in their first language bilinguals will use cues differently from monolinguals. While this may mean simply adopting a weighting that is closer to the second language (English), the difference may manifest itself in other ways. The differences between languages are interesting in themselves, but are not the point of the present experiment, which is concerned only with monolinguals versus bilinguals.

### Method

Subjects in each group were instructed to read the sentences to indicate which of the two Ns was the subject, i.e. the doer of the action:

You have to say which one of the two nouns in each sentence is the subject, that is to say which one does the action. The subject must be one of the two nouns that are actually in the sentence.

This was translated into the three other languages. The latter part of the instruction was necessitated by the pro-drop nature of the first languages; both nouns in the sentence could otherwise be treated as objects with an unexpressed subject. The subjects were told not to worry if the sentences seemed odd. They were also told to concentrate on the task and not to talk to their companions. The subjects were tested in groups in a quiet classroom environment.

### Results

Throughout, the results compare the performance of the 'monolingual' and 'bilingual' groups of subjects for each language in terms of the percentage of responses choosing the first N rather than the second N as subject, as is standard in the Competition Model paradigm. That is to say, a score of 75% means that the N1 was chosen rather than the N2 for 75% of the relevant sentences. Whether the response is appropriate depends on the specific language involved and on the cue being tested. The results are also presented in all the graphs in terms of the three word orders from left to right (NVN, VNN, NNV) again as standard in this paradigm. The groups will be referred to as bilinguals and monolinguals for convenience, though as defined above they were strictly speaking maximal and minimal

bilinguals. For reasons of space only a selection of the results will be presented here.

### Word order

The sentence types testing the three word-order variants were illustrated by the English master sentences:

- (a) NVN: The dog pats the tree.
- (b) VNN: Watches the monkey the pen.
- (c) NNV: The horse the rock kisses.

Three sentences were tested for each word order, all with singular N1 and N2. Agreement provided no cue, since both Ns were singular; animacy and inanimacy were systematically varied. Figure 10.1 shows the results for the monolingual and bilingual groups for each language.

Looking at monolinguals, the importance of word order to Spanish is shown by the 67% score for N1 in the NVN word-order compared with 11% in the NNV order (i.e. 89% preferring N2). Greeks also score 62% for N1 in the NVN sentences but differ from Spanish speakers in having no real preference in VNN and NNV. Japanese monolinguals have a low score for N1 in all orders (32%, 36%, 32%), thus showing a preference for the second N. In none of these languages, however, is there a significant difference between the bilingual and monolingual groups (*t*-tests, two-tailed).

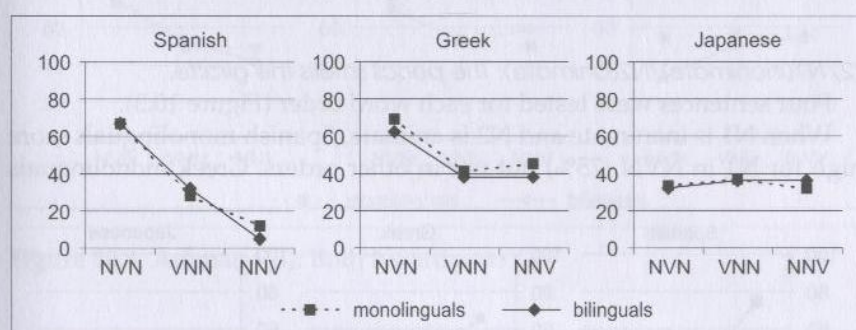


Figure 10.1 Word order

### Animacy

The results for animacy need to be divided into three categories, depending whether the N1 and the N2 have different animacy or both N1 and N2 are animate, all with singular Ns and singular Verb.



(1) *N1(animate)/N2(inanimate): The cat pats the pen*

Three sentences were tested for each word order. (Figure 10.2).

When N1 is animate and N2 inanimate, animacy is of minor importance in Spanish and Greek monolinguals, Greeks having a slight overall preference for animate N1 in all word orders. Japanese monolinguals have a strong preference for animate N1 across word orders (70%, 83%, 81%). Japanese bilinguals have higher scores than monolinguals for animate N1s in all three word orders, significantly so for NVN (94% versus 70%) (*t* test, d.f. 43,  $p < 0.002$ ). In other words, bilinguals show greater preference for a cue than monolinguals do.

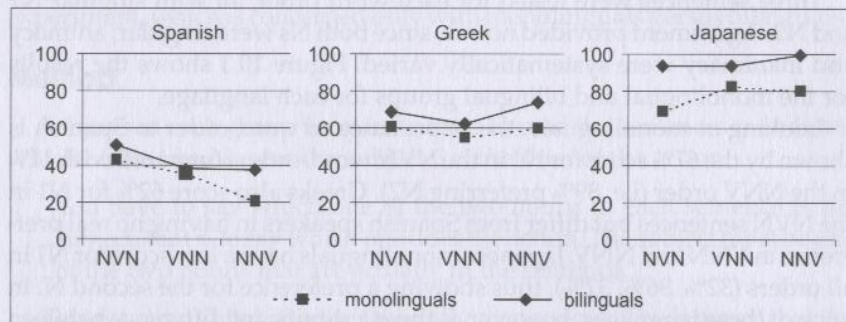


Figure 10.2 Animacy (1): N1(animate)/N2(inanimate)

(2) *N1(inanimate)/N2(animate): The pencil smells the giraffe.*

Four sentences were tested for each word order (Figure 10.3).

When N1 is inanimate and N2 is animate, Spanish monolinguals score high for N1 in NVN (75%) but not in other orders. Greek monolinguals

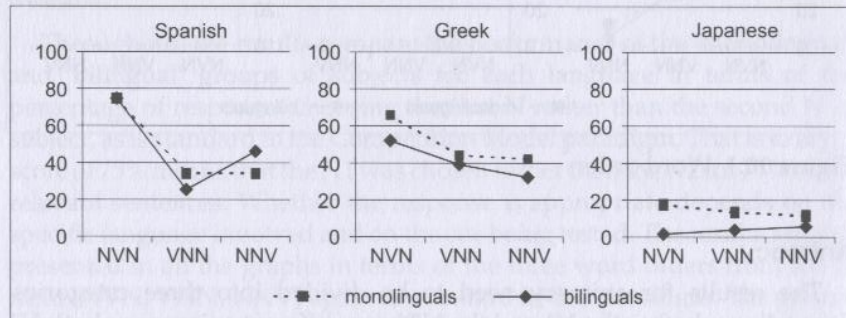


Figure 10.3 Animacy (2) N1(inanimate)/N2(animate)

score high in NVN (67%) and low in NNV (32%). Japanese monolinguals have low scores for N1 in all orders (18%, 13%, 11%), again showing their preference for the animate Noun. However Japanese bilinguals choose the inanimate N1 significantly *less* than the monolinguals on NVN (1% versus 18%) (*t*-test, d.f. 43,  $p < 0.006$ ), thus showing an increased preference for animacy.

(3) *N1(animate)/N2(animate): The dog eats the donkey.*

Four sentences were tested for each word order (Figure 10.4).

When both Ns are animate, Spanish and Greek monolinguals score high for N1 in NVN order (74% and 77% respectively); Japanese are neutral. There are significant differences between monolinguals and bilinguals. Spanish bilinguals score N1 less than monolinguals in NNV (43% versus 49%) (*t*-test, d.f. 38,  $p < 0.04$ ). Greek bilinguals score N1 less in NVN (70% versus 77%) (*t*-test, d.f. 75,  $p < 0.04$ ) but more in NNV (58% versus 50%) (*t*-test, d.f. 75,  $p < 0.04$ ). Japanese bilinguals score N1 less than the monolinguals in NVN (34% versus 55%) (*t*-test, d.f. 43,  $p < 0.02$ ). The preference of bilinguals for animacy has then changed in all three languages, most markedly in Japanese.

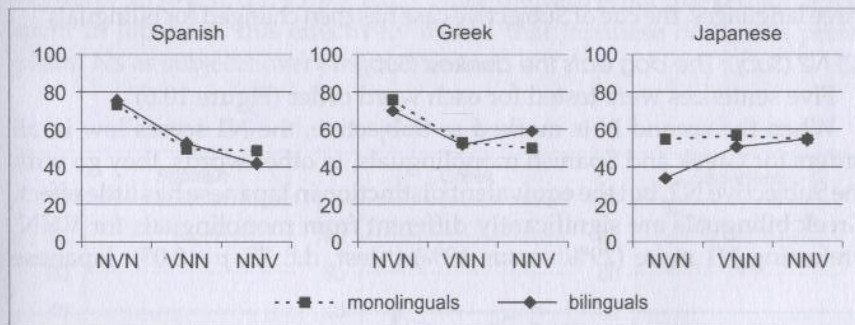


Figure 10.4 Animacy (3): Both Ns animate

Case

The results for case are divided into two categories depending on whether N1 or N2 was marked as Subject. In Japanese this therefore means marking with the particles *ga* and *wa* rather than with inflections.

(1) *The rock (Subj) licks the turtle*

Three sentences were tested for each word order (Figure 10.5)

The N1 marked as Subjective is preferred strongly by the Spanish monolinguals in NVN (98%) but not in VNN (5%); N1 is preferred by Greeks across



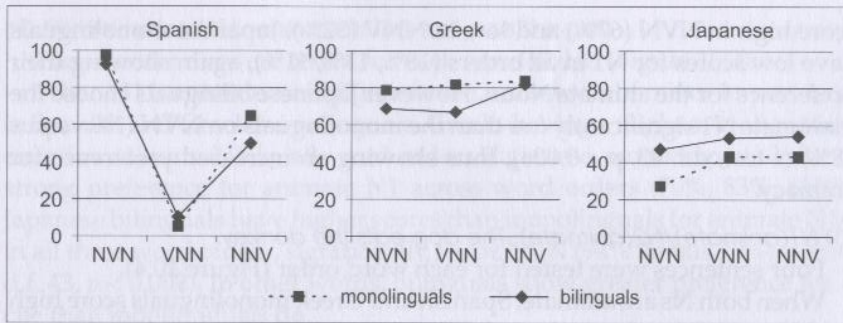


Figure 10.5 Case (1): N1 (Subjective)

orders (79%, 82%, 84%). Japanese monolinguals are little affected by case across orders. Spanish bilinguals have significantly less preference than monolinguals for N1 in NNV (50% versus 65%) ( $t$ -test, d.f. 38,  $p < 0.05$ ), Greek bilinguals show significantly less preference for N1 in VNN (67% versus 82%) ( $t$ -test, d.f. 43,  $p < 0.03$ ), Japanese bilinguals have significantly more preference for N1 in NVN (47% versus 27%) ( $t$ -test, d.f. 43,  $p < 0.05$ ). In all three languages, the cue of Subjective case has then changed for bilinguals

(2) N2 (Subj): *The dog eats the donkey (Subj)*.

Five sentences were tested for each word order (Figure 10.6)

When the second N is marked as Subjective, the N1 scores low in all orders for Greek and Spanish monolinguals, in other words, they go with the Subjective N2, but the equivalent distinction in Japanese has little effect. Greek bilinguals are significantly different from monolinguals for VNN, preferring N1 more (29% versus 19%) ( $t$ -test, d.f. 75,  $p < 0.03$ ). Japanese

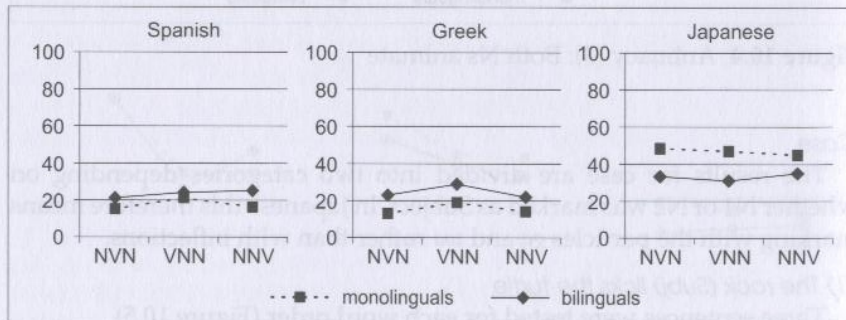


Figure 10.6 Case (2): N2 (Subjective)

bilinguals prefer the N1 less than the monolinguals, significantly so for VNN (32% versus 47%) (*t*-test, d.f. 43,  $p < 0.05$ ). Again for two of the languages there are differences for bilinguals for the case cue.

### Number

Number is a composite factor of the number of the N and the agreement of the verb with singular or plural N, except in Japanese where it applies only to the Noun. Sentences testing Number are divided into those with N1 plural + N2 singular + singular verb and those with N1 singular + N2 plural + plural verb.

(1) *all animate: N1(plural)/V(singular)/N2(singular): The dogs bites the monkey.*

Four sentences were tested for each word order (Figure 10.7).

Given a choice between plural N1 and singular N2 with singular Verb agreement, Spanish and Greek monolinguals score low for N1 in all word orders: Japanese monolinguals show a slight consistent preference for plural N1s overall. Japanese bilinguals score higher than monolinguals for plural N1 in all three orders: NVN (94% versus 64%) (*t*-test, d.f. 43,  $p < 0.001$ ), VNN (83% versus 65%) (*t*-test, d.f. 43,  $p < 0.005$ ) and NNV (90% versus 67%) (*t*-test, d.f. 43,  $p < 0.05$ ). Since the Verb is not marked for agreement in Japanese, this effectively means that Japanese bilinguals prefer plural Ns as subjects over singular nouns.

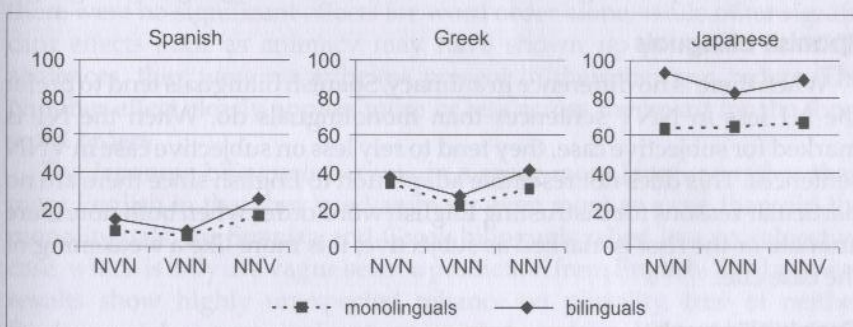


Figure 10.7 Number (1): N1 plural

(2) *N1(singular)/V(plural)/N2(plural) The bear lick the dogs.*

Three sentences were tested for each word order (Figure 10.8).

When N1 is singular and N2 plural in agreement with a plural verb,



Spanish and Greek monolinguals score less than 10% for the N1, but higher for NVN order (35% and 42% respectively). The Japanese have a similar pattern with slightly higher N1 scores. Japanese bilinguals have lower scores for the singular N1 in all orders than monolinguals, significantly so for NVN (21% versus 48%) (*t*-test, d.f. 43,  $p < 0.005$ ). Again Japanese bilinguals have a stronger preference for plural nouns than monolinguals.

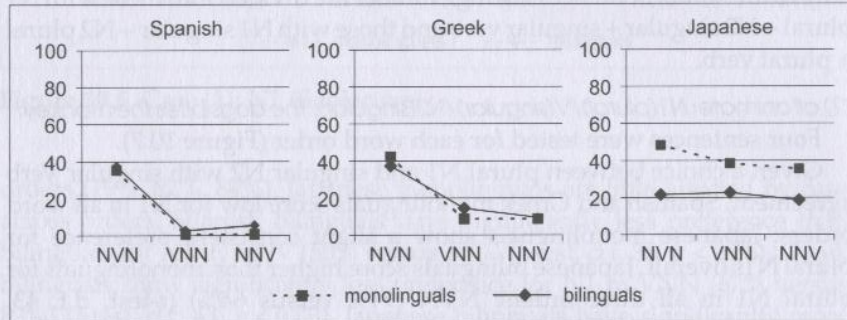


Figure 10.8 Number (2): N2 plural

## Discussion and conclusions

Let us sum up the significant results and issues language by language.

### Spanish bilinguals

When there is no difference in animacy, Spanish bilinguals tend to prefer the N1 less in NNV sentences than monolinguals do. When the N1 is marked for subjective case, they tend to rely less on subjective case in VNN sentences. This does not resemble adaptation to English since there are no particular reasons for distrusting English word order when both nouns are animate or the first is marked as subjective; it is more like a weakening of the case cue.

### Greek bilinguals

When both nouns are animate, Greek bilinguals prefer N1 less in NVN, more in NNV. When the N1 is subjective, they prefer it less in VNN, when the N2 is subjective they prefer N1 more in VNN, in other words they tend to score lower on nouns marked by case whether in first or second position. The cue of case has lost strength.

### Japanese bilinguals

For animacy the Japanese bilinguals scored significantly differently on all three types: animate N1s and animate N2s are preferred more; when there is no difference between the two Ns, the first is preferred more than by monolinguals. The animacy cue in Japanese seems to have become hyper-animacy – above the monolingual state rather than towards English. In view of Harrington's findings for Japanese (Harrington, 1987), the reliance on animacy is not surprising but the extra reliance on it in the first language is remarkable. In terms of case, the Japanese bilinguals showed more preference for N1 subjective in NVN and for N2 subjective in VNN than did the monolinguals. That is to say, the Japanese bilinguals rely less on the subjective case, marked by the particles *ga* and *wa*, than the monolinguals. This does not seem ascribable particularly to English, which would have predicted a word order effect. In terms of Number, Japanese bilinguals scored plural Ns higher than monolinguals for all three orders when N1 was plural, and for the NVN order when the N2 is plural. There is no obvious reason in either English or Japanese why plural nouns should be more attractive to bilinguals than to monolinguals.

All three groups of bilinguals, then, exhibit some differences from monolinguals. It would be convenient if these could simply be ascribed to English as the second language. However the shift does not seem solely in the direction of English. For example it might have been expected that English SVO would have affected primarily Japanese SOV word order; but there were no significant effects for word order alone; while other significant effects such as animacy may have shown up primarily in NVN sentences, they were nevertheless present in the other two orders. The Number effect clearly applies more or less across the board for the three word orders.

The Japanese bilinguals became in a sense more Japanese rather than more English in that they used animacy even more as a cue than did the monolinguals; the Spanish and Greek bilinguals relied less on subjective case, which is only in a vague sense a prediction from English. The Japanese results show highly unexpected reliance on plurality, true of neither English nor Japanese, and not a recorded strategy. Why should plural nouns be more attractive to bilinguals when agreement is not relevant to Japanese, and plurality is irrelevant in English to choice of subject? Japanese speakers have suggested to us that it might be related to the topic issue in Japanese syntax, or to the fact that plurality is a concept only to those Japanese who have studied a second language and hence has a peculiar salience. In other words, the Competition Model paradigm of subject



assignment needs adaptation for Japanese, particularly as of course the cue of agreement to which Number relates in many languages does not exist in Japanese.

There thus seem to be two separate tendencies, neither of which is a movement towards processing strategies in the second language, English:

- (1) *Weakening of cues.* The bilinguals do not trust familiar cues such as animacy or case as much as the monolinguals do.
- (2) *Adoption of novel cues.* Japanese bilinguals in particular, by using animacy and plural cues more than monolingual do, are behaving in unexpected ways.

Both tendencies can be considered to be general effects of acquiring a second language on the person's concept of language, partly by reducing their trust in their existing way of processing less, partly by making them aware of categories that they had not encountered in their first language – this is an aspect of the bilinguals' enhanced metalinguistic awareness that Bialystok (1993) and others have argued for. Japanese bilinguals are susceptible to animacy or plurality because in some way acquiring English has opened their eyes to universal grammatical categories. Certainly this genre of research into L2 effects on the L1 must be prepared to find differences between monolinguals and bilinguals that are due to the overall changed state of the L2 user (ie, their multi-competence) rather than to the specific effects of learning a particular second language. But, whatever the explanations that future research may come up with, this experiment has clearly shown that L2 users do not process the sentences of their first language in the same way as monolingual native speakers do.

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