

Chapter 1

Introduction

Variability in the production of L2 functional morphology has long been recognised as a pervasive and entrenched characteristic of interlanguage development. This phenomenon is especially prevalent within spoken production (White, 2003, p. 178), a tendency readily attributable to the communicative pressure exerted on the L2er in this scenario. More often than not, variability involves the omission of morphemes such as articles, plurals, past tense (both regular and irregular) and agreement in obligatory contexts, though substitution and oversuppliance of such material have also been observed in the use of articles in particular. Representative examples from L2 English are given in (1) to (4). I exemplify the omission of agreement and oversuppliance of plurals in (1), while (2) shows the omission of articles and plurals (example (1) from White, 2008, p. 316; example (2) from Robertson, 2000, p. 166)).¹ In (3), I give an example of regular past-tense omission (from Lardiere, 1998a, p. 18). All of these cases come from the spoken production of Chinese learners. In (4), I illustrate the substitution of an indefinite article with a definite one in the written production of a Korean speaker (example from Ionin, Ko & Wexler, 2004, p. 4).

- (1) Mary gets up at 6 o'clock every morning. And then she *clean* her *teeths* and her face.
- (2) When you draw, you touch the centre of \emptyset triangle, draw two *circle*.
- (3) He *call* me last night.
- (4) When I was living in Ulan-Ude yet unmarried my friends presented me *the* small seamese kitten. [Paraphrase: When I lived in Ulan-Ude and was still unmarried, my friends gave me a small Siamese kitten.]

¹ In (2), the omitted article is indicated by the symbol ' \emptyset '.

Despite considerable research activity, there is still much uncertainty and confusion over exactly what gives rise to variability in the L2 production of functional morphemes. This is especially true of the omission of these items by learners from L1 backgrounds which themselves lack morphological reflexes for the associated functional categories. For example, Lardiere (1998a, 1998b, 2000) suggests that this form of variability is due not to a deficit in underlying syntactic competence; rather, it is caused by a computational breakdown in the mapping between syntactic features such as tense or agreement on one hand, and the morphological exponents which realise these features on the other. In the Missing Surface Inflection Hypothesis (MSIH) (Prévost & White, 2000), Lardiere's original proposal is modified such that morphological variability is attributable instead to difficulties with accessing these exponents from the lexicon under communicative pressure. In response to these difficulties, learners fall back on underspecified representations of the target morphemes as defaults. Note also that, canonically, these problems with mapping or access are assumed to be L1-independent.

In other studies, though, the particular characteristics of the L1 *are* assumed to play a crucial role in shaping the patterns of omission that are observed. For instance, Lardiere (2003) speculates that the performance-based problem outlined above may be aggravated by phonological transfer. That is, difficulties with reliably producing final consonant clusters in the L2 (whether in a monomorphemic form (e.g., 'crypt') or an inflected form (e.g., 'tapped')) are due at least partly to the absence of such clusters in the L1.

Another theory in which L1 effects play a significant role is the Interpretability Hypothesis (IH) (Hawkins & Liszka, 2003; Tsimpli & Dimitrakopoulou, 2007). As necessary background, UG makes available a set of 'uninterpretable' features which are valued by a further set of cognate 'interpretable' features; for instance, in a native grammar, the person and number features on the inflected verb in the sentence 'Her brother writes' are valued by the subject 'her brother'. In each of these studies, the authors propose that an uninterpretable feature (e.g., [\pm past]) which is lacking in the L1 cannot be acquired in the L2 after the critical period has ended.

Like Hawkins and Liszka (2003) and Tsimpli and Dimitrakopoulou (2007), Hawkins and Casillas (2008) adopt the basic view that variability in L2 morphological production stems from the unavailability of a particular uninterpretable feature in the L1; however, Hawkins and Casillas take this position one step further by postulating a

specific mechanism used by early learners for dealing with this deficit in the interlanguage grammar. In the view of these researchers, phonological exponents in native grammars are specified as bundles of features which are relatively insensitive to the context in which each exponent is inserted. For early learners, however, the entries for these exponents are structured in terms of context-sensitive dependencies because these learners do not yet have access to uninterpretable features. As an illustration, compare the native representation for the agreement morpheme /s/ in (5) with its early L2 counterpart in (6) (both examples from p. 602).

- (5) /s/ ↔ / [V, -past, +sing, 3p] + ___
 (6) /s/ ↔ / [V] + ___ / [T, -past] ___ / [N, +sing, 3p] ___

As Hawkins and Casillas (p. 602) put it, (6) should be understood as “insert /s/ in the context of a verb which is in the context of a non-past T, itself in the context of a 3rd person, singular N”. This analysis of interlanguage morphology, in turn, underpins the Contextual Complexity Hypothesis (CCH). The essence of the CCH is that the greater the number of terminal nodes necessary for specifying the context in which a particular vocabulary item is inserted, the greater the likelihood that this item will not be retrieved.

This interest in the L2 acquisition of features receives perhaps its most fully-developed expression in the Feature Reassembly Hypothesis (FAH) (Lardiere, 2009). In Lardiere’s view, the language learner has to select a set of features from a universal pool, put them into matrices to create functional categories, and assemble the features into lexical items. Applying this model to an L2 scenario, Lardiere suggests that the last two of these tasks pose particular difficulties. The reason is that, as new features and their configurations are detected in the input, the learner has to reshape the feature organisation in the L1, for example by checking any new features that need to be acquired.

To recap, feature-based approaches to L2 acquisition assume a representational deficit in the interlanguage grammar. Another theory which presupposes this type of deficit is the Morphological Underspecification Hypothesis (MUSH) (McCarthy, 2008). This theory of variability extends the MSIH to comprehension data, and predicts that learners will utilise underspecified representations of target morphemes rather than forms which give rise to mismatches between features. By the same token, the MUSH views variability as the reflex of a deficit in the morphological component itself: this

phenomenon is not due merely to performance-based difficulties with accessing the phonological exponents of these morphemes from the lexicon, or with mapping them onto their associated functional categories.

The Syntactic Misanalysis Hypothesis also assumes a representational deficit; however, in this instance, variability in L2 morphological production is essentially attributed to processing problems which are contingent upon this deficit (and not due to the deficit itself). Trenkic (2007) observes that, in the written production of a group of article-less learners, this morpheme was omitted more often in complex DPs with the structure Art + Adj + N (e.g., ‘the black cat’ → ‘black cat’) than in simple DPs with the structure Art + N (e.g., ‘the cat’ → ‘cat’). Trenkic hypothesises that learners whose L1 lacks an article system of its own misanalyse these items as adjectives expressing identifiability. The consequence is that when the article occurs in a complex DP, it is liable to be ‘sacrificed’ in response to constraints on the attentional resources available for processing this structure. By contrast, this competition for resources does not arise in a simple DP, so the article is omitted less frequently in this context.

As we have seen, functional morphemes are notoriously difficult to produce reliably in the L2 if the L1 lacks the associated functional category. This difficulty is central to the Bottleneck Hypothesis (Slabakova, 2006, 2008). What Slabakova proposes, in essence, is that functional morphemes constitute the ‘bottleneck’ in L2 acquisition. She adopts this perspective on the grounds that the functional categories associated with these morphemes serve to distinguish the languages of the world from one another in syntactic and semantic terms. In addition, functional morphemes are processed using declarative memory, must be learned on an item-by-item basis, and may pose problems for some learners on a phonological level as well. However, once the relevant morphemes of the L2 are acquired, the task of learning other properties of the target language (such as syntax and semantics) is expected to proceed more easily.

To recap, the underlying causes of L2 morphological omission have been the subject of much debate in recent years. A similar lack of consensus is also evident in research focusing on the substitution of these items. For example, although the tendency of article-less learners to substitute indefinite articles with definite ones has been attributed to semantic factors, it is by no means certain which factors of this type are actually implicated. For example, Ionin et al. (2004) start by postulating an Article Choice Parameter, which predicts that such choices in L2 acquisition will be conditioned by the specificity of the entity that is being talked about. On this basis,

these researchers propose the Fluctuation Hypothesis, which holds that learners will fluctuate between the settings of this parameter until they receive enough input to set it to the target value. Trenkic (2008), by contrast, takes the processing-based explanation for variability in article omission proposed in Trenkic (2007), and applies it to the substitution of articles as well. The findings of Trenkic (2008) indicate that, *pace* Ionin et al., the substitution of indefinite with definite articles is less plausibly attributable to the specificity of the referent than to the speaker's stated or denied familiarity with it.

It is also worth touching upon the role played by UG access in the competing theories described so far in this chapter. A subset of these theories are consistent with the Full Transfer / Full Access model of Schwartz and Sprouse (1994, 1996), which holds that adult learners have unrestricted access to UG's full set of interpretable and uninterpretable features. Note also that, in these circumstances, parameter resetting is assumed to be relatively easy. The MSIH, for instance, basically ascribes errors in morphological production to performance factors rather than to a deficit in the interlanguage representation itself. Likewise, the FAH relies crucially on the notion of an array of universal features that constitute the building blocks of language, so the assumption of full access to UG is made explicit in this theory. Other hypotheses related to variability in L2 functional morphology, however, claim that the learner will inevitably fall short of native-like attainment unless the target structure is acquired before the critical period ends. The IH is a notable example of a theory of this kind.

Trenkic (2007, p. 292) suggests that a potentially fruitful way of identifying the sources of this variability is to compare the rates at which a given morpheme (e.g., past tense) is omitted, substituted or oversupplied in two (or more) distinct contexts. As shown above, Trenkic's own study is an apt example of this approach. Admittedly, comparisons of the type that she identifies have already played a role in some studies specifically concerned with probing the causes of L2 variability. For instance, in Hawkins and Casillas (2008), differences in the rates of agreement omission are traced to contrasts in the distance between the subject noun and the verb. Even so, more research on these patterns is undoubtedly required, not only because some of these asymmetries are still relatively under-researched, but also because the findings of studies in these specific areas have often been compromised by methodological shortcomings. The overriding goal of the current thesis is to pursue the research implications of existing work in three such areas. In so doing, I aim to demonstrate that

asymmetries in the production of functional morphology can cast light on the underlying causes of L2 variability.

All told, four theories which predict this type of pattern are tested in this thesis. One of these theories relates to the omission or substitution of definite articles in first- vs. second-mention DPs.² The second theory is the Prosodic Transfer Hypothesis (PTH) (Goad, White & Steele, 2003; Goad & White, 2004), which bases its predictions on divergences between the prosodic structures found in the L1 and the L2. I also test the Efficiency Hypothesis (EH) (Littlewood, 1981) and the Priming Hypothesis (PH) (Mellow & Cumming, 1994). These two theories predict diametrically-opposed contrasts in the suppliance of plural inflection in concorded QPs (e.g., ‘four ducks’) vs. bare QPs (e.g., ‘ducks’).

A salient characteristic of these four explanations is that, even though they all focus on asymmetries in L2 functional morphology, they are otherwise quite disparate in terms of their theoretical underpinnings. For instance, each of the PTH (at least, as articulated in Goad & White, 2004), the EH and the PH assumes, whether overtly or not, that the learner has full access to UG. However, this is not true of the first theory tested in the thesis, as it presupposes a syntactic deficit in the representation of definiteness. By investigating a variety of theoretical approaches, I intend to make my coverage of the issue which lies at the heart of the present study as representative as possible.

A further distinctive attribute of this study is that Korean learners of English constitute the L1 group of interest. Although this group has figured prominently in recent work on article substitution (e.g., Ionin et al., 2004), less attention has been paid to these learners within studies dealing with the omission of functional material in general. Hence, the use of this L1 group in the present thesis will broaden scholarly coverage of the omission of these elements in cross-linguistic terms. More importantly, as we shall see in due course, specific mismatches between Korean and English in syntactic and prosodic terms enable the predictions under investigation in this thesis to be tested in an illuminating way.

² These contexts for article use will be exemplified in section 2.0.

The remainder of the thesis has the following structure. Each of CHAPTERS 2 to 4 reports the outcome of one experiment.³ In CHAPTER 2, we look at the use of definite articles in first- and second-mention DPs. Here, contrasts in non-target form-meaning relationships plus communicative redundancy predict systematic divergences in the omission or substitution of these items. I focus on past tense, agreement and plural morphology in CHAPTER 3, and test the PTH against asymmetries in the omission of these inflectional items. The specific claim to be tested here is that differences in stem length and (for tense inflection only) verb class give rise to patterns of omission in contrasting environments. The experiment reported in CHAPTER 4 focuses on plurals in various types of concorded and bare QP, and tests the EH and PH against the differential suppliance of plural omission in these phrasal contexts. In this chapter, I examine the effects of contrasts in quantifier type and syntactic structure on the production of plural inflection. CHAPTER 5 concludes the thesis.

A note on the task used in this thesis is also called for. In each of these experiments, I employ a combined elicited-imitation and story-recall task based on the one adopted in Snape (2006). The task is described in CHAPTER 2 in general terms, and also with specific reference to the experiment reported in that chapter. Additional methodological details which are particular to each of the experiments in chapters 3 and 4 are made available in the relevant chapters.

³ These three body chapters are organised in parallel rather than in series with respect to each other, so to speak; for example, the outcome of the experiment reported in chapter 3 has no bearing on the outcome of the one in chapter 4.

Chapter 2

Experiment 1: Definite articles in first- and second-mention DPs

2.0 Introduction

Among other functions, definite articles are used in English to identify definite referents in first- and second-mention DPs. In (1), I show the ‘associative’ use of this item in the former type of context, while (2) illustrates its anaphoric use in the latter (example (1) from Lyons, 1999, p.3; example (2) from Ionin, Ko & Wexler, 2004, p. 7).

- (1) I had to get a taxi from the station. On the way *the driver* told me there was a bus strike.
- (2) I saw a cat. I gave *the cat* some milk.

Several studies have predicted specific asymmetries in the omission or substitution of definite articles between these two types of context in L2 production (Goad & White, 2009; Pongpaibroj, 2008; Robertson, 2000; Sharma, 2005; Trenkic, 2000, 2002). A key feature of this body of work is that it focuses on learners of English whose native languages do not signal definiteness explicitly themselves.¹

However, inconsistencies in the results obtained have had the cumulative effect of undermining support for the predictions in question. In turn, this situation seems to be at least partly due to methodological issues; specifically, Pongpaibroj’s (2008) second-mention DPs were all located in contrastively-stressed discourse contexts, while Goad and White (2009) pooled indefinite together with definite articles as first mentions. Furthermore, given that advanced participants were not explicitly distinguished from speakers at lower levels of proficiency (Sharma, 2005), were included only in small numbers (Goad & White, 2009), or performed in markedly

¹ The term ‘definiteness’ is sometimes understood to subsume *indefiniteness* as well (as in the title of Lyons, 1999). I am using this term literally here to mean the use of a definite article (or similar) only.

different ways in different studies (Trenkic, 2000, 2002 cf. Pongpairoj, 2008), it is uncertain if the predicted asymmetry in the omission of definite articles only reveals itself at lower levels of L2 proficiency, or is a feature of late interlanguage development too. The goal of the current experiment is to test both of these claims in such a way that each issue noted above is addressed in a rigorous manner. I also focus on Korean learners: this group is suitable for investigation in experiment 1 because, like the other L1s featured within this corpus, Korean does not have an article system of its own.

The current chapter has the following structure. Section 2.1 is a review of earlier work on the omission and substitution of definite articles in first- and second-mention DPs. The predictions of the current experiment are also stated in this section. In section 2.2, I describe the methodology that will be used not only in the present experiment, but in the two which follow in this thesis. The results of the study are reported in section 2.3, and their significance discussed in section 2.4. I conclude the chapter in section 2.5.

2.1 Review of previous research

This section reviews some key studies focusing on asymmetries in the omission or substitution of definite articles between first and second mentions.² In section 2.1.1, I state the two predictions which have been tested in the literature concerned with these asymmetries, and which will also be the predictions for the present experiment. Section 2.1.2 summaries the key studies in this area. Their research implications are identified in section 2.1.3.

2.1.1 Predicted asymmetries

Two claims have been tested in research related to these patterns. One is that definite articles will be omitted less often in first than second mentions. The other claim is that definite articles will be substituted by indefinite articles more often in first than second mentions. As formulated by Trenkic (2000, pp. 238, 242-243), both predictions rest on the assumption that L2ers learn from formal instruction in the target language, and also perhaps from the frequencies of definite-article use that they encounter in the input, to mark second mentions with this item as a signal of identifiability. Likewise, first

² Each of these studies examines other contexts for article use as well. As far as possible, I will confine myself to summarising only those aspects of each study which are pertinent to the specific topic of this chapter.

mentions bear the indefinite article because, again as a consequence of instruction plus exposure, the use of this type of article is associated with DPs which occur in this particular context. Thus, on a more general level, Trenkic is suggesting that L2ers link article form and article meaning in non-target-like fashion. An additional assumption underlying Trenkic's prediction for the omission of definite articles is that if the identifiability of a particular referent is readily recoverable from the discourse-pragmatic context, this item will be rendered communicatively redundant, and a general principle of least effort will cause it to be omitted. Since identifiability is more likely to be recoverable in second than first mentions, the prediction for omission naturally follows.

2.1.2 Summaries of key studies

In the earliest study of omission errors considered here, Robertson (2000) investigates the use of definite articles by 18 Chinese learners of English. The author assumed that the participants in his study had achieved an IELTS score of at least 6.5; this placed them in the advanced range. An information-gap pair-work task was used; because of this choice of methodology, Robertson was able to record instances of definite-article omission occurring across dialogic exchanges as well as within stretches of monologic discourse. Each pair consisted of a speaker and a hearer: the speaker described a diagram on a sheet of paper to the hearer, and the hearer had to use this information to reproduce the diagram as accurately as possible. Four diagrams were utilised for this purpose. Robertson identifies several contexts in which definite articles were used in first or second mentions. In addition, he distinguishes between what he calls 'echo' and 'non-echo' contexts; it is the latter type of scenario that interests us in the present experiment, as these include first and second mentions.³ In table 2.1, I list the rates at which definite articles were omitted in these contexts (table adapted from Robertson, 2000, pp. 153, 165).^{4,5}

³ In an echo context, a referent is mentioned a second time across a turn boundary, as I show in (i) (example adapted from Robertson, 2000, p. 160; echo DP in italics).

- (i) A. Inside the blue triangle, use, using the red pen.
 B. *Red pen*. It's opposite?
 A. Yeah, opposite.

⁴ Examples of the types of first mention in table 2.1 are shown below (examples (iv) and (vi) from J. Hawkins, 1978, pp. 139, 147; remaining examples from Lyons, 1999, pp. 3, 9).

mention	context type	no. of cases	omission (%)
first	immediate-situation use	74	27.0
	wider-situation use	391	16.6
	head noun of an associative-phrase DP	221	14.5
	unexplanatory use	68	20.6
	DP with nominal modifier	15	20.0
	DP with establishing relative-clause	9	0.0
second	anaphoric use of definite DP	564	16.3

Table 2.1: Omission (%) of definite articles in various contexts (Robertson, 2000)

Although definite articles were omitted at a lower rate for head noun of an associative phrase than anaphoric use, the results in this table indicate a higher rate of omission in first- than second-mention contexts on the whole.^{6,7}

Trenkic (2000, 2002) studied the use of definite articles by Serbian learners. A total of 286 subjects were assigned to four groups: pre-final-year secondary-school students (A), final-year secondary-school students (B), pre-final-year university students training to become EFL teachers (C), and final-year university students training to become EFL teachers (D). Trenkic assumed that the overall educational level (and age range) of its members correlated roughly with the proficiency level of each group.

-
- (ii) Just give *the shelf* a quick wipe, will you, before I put this vase on it. (immediate-situation use)
 - (iii) I hear *the prime minister* behaved outrageously again today. (wider-situation use)
 - (iv) I remember *the beginning of the war* very well. (head noun of an associative-phrase DP)
 - (v) I've got *the same problem* as you. (unexplanatory use)
 - (vi) I can't stand *the name Algernon*. (DP with nominal modifier)
 - (vii) *The bloke Ann went out with last night* phoned a minute ago. (DP with establishing relative-clause)

⁵ Robertson illustrates an anaphoric context with (viii) (example from p.145; anaphoric DP in italics).

- (viii) A. And then after that you draw a square with the red ...
- B. Square?
- A. Yeah, a square.
- B. What does *the square* draw like?

This example occurred across a turn boundary: one member of the pair provided the introductory DP 'a square' and the other the anaphoric DP 'the square'. Robertson does not specify whether the anaphoric contexts in his data were all of this type, or there were also some cases in which the same speaker produced both the introductory DP and the anaphoric DP. Be that as it may, there does not seem to be any principled rationale for suspecting that definite-article use *across* a turn boundary might pattern significantly differently from its use *within* a turn. Accordingly, I assume that Robertson's findings can be placed on the same footing as those of the remaining (monologically-based) studies reviewed in this section.

⁶ I am excluding from consideration the data for nominal modifiers and establishing relative-clauses on the grounds that very few instances of either type of context were recorded.

⁷ Unfortunately, Robertson (2000) does not supplement the rates shown in table 2.1 with the results of any significance testing.

She added that the least proficient of the four groups (A) did not consist of zero beginners (since this group had had seven years of instruction), and that the two highest-proficiency groups (C and D) were distinguished from each other in order to detect “very late improvements” in definite-article use (Trenkic, 2002, pp. 119-120). On this basis, I tentatively conclude that the proficiency levels of the four L2 groups ranged from intermediate to advanced. A control group of 20 native speakers was also involved in the study. The L2ers in the experiment were given a written Serbian-to-English translation task consisting of several short texts; the control group completed a cloze test based on English versions of the translation texts.

Trenkic tested both of the predictions of interest in this chapter. Omission of definite articles by the L2ers in her study was statistically higher in second than first mentions for the lower-proficiency groups A and B. For each of the remaining two Serbian groups, omission was slightly lower in second than first mentions, though not to a statistical degree.⁸ For the control group, Trenkic found a statistical difference in omission rates in the predicted direction between first and second mentions, but took the view that this conclusion was unreliable. The prediction for substitution errors was upheld for all four groups of L2ers, though the asymmetry was less pronounced for the upper intermediate and lower advanced groups than for the remaining two L2 groups. As expected, this prediction was disconfirmed for the control group.

In Sharma (2005), the participant group consisted of speakers of various Indian languages. The data was collected from 12 first-generation immigrants in California, most of whom were in the workforce at the time the study was carried out. The group also exhibited a “relatively diverse range of English proficiency levels” (p. 541), though the author does not give details of how this attribute was measured. Another relevant detail is that none of the 12 subjects had studied English formally in the United States. The data was gathered through open-ended sociolinguistic interviews covering a range of topics. In table 2.2, I display Sharma’s findings for definite-article omission in each context (table adapted from Sharma, 2005, p. 559).⁹

⁸ Henceforth in this thesis, I implement Kline’s (2004, p. 20) recommendation to replace the term ‘statistically significant’ with ‘statistical’, thereby reserving the term ‘significant’ to mean ‘important’.

⁹ Sharma used categories from Prince’s (1981) scale of assumed familiarity to label these contexts; these categories are retained in the table. Notice that Sharma takes second-mention definites to be higher in givenness (cf. newness) than first-mention definites. I will be assuming in this chapter that, to all intents and purposes, this notion of givenness is equivalent to that of identifiability.

mention	context type	no. of cases	omission (%)
first	unused (= wider-situation use)	54	33
	inferable (= associative-anaphora use)	323	30
	cont. inferable (= head noun of an assoc. phrase DP)	156	22
second	evoked (= anaphoric use)	102	57

Table 2.2: Omission (%) of definite articles in various contexts (Sharma, 2005)

These results showed that definite articles were omitted more often in second- than first-mention contexts.¹⁰

A more recent study by Pongpairoj (2008) deals with definite-article production by Thai learners. Two groups were involved: one at intermediate proficiency (N=20) and one advanced (N=20). These were comprised of secondary-school students at international schools and first-year university students in international programs in Thailand. The proficiency of the L2ers was gauged using the Oxford Placement Test (Allan, 2004). A written translation task was employed; this consisted of 12 texts, each 2-3 sentences long. The first-mention DPs that Pongpairoj elicited were of the associative-anaphora type only. For the intermediate Thai group, the overall omission rates for definite articles in first and second mentions were 28.75% and 54.38% respectively, while the advanced Thai group omitted these items in first mentions at 16.25% and in second mentions at 30.63%. Pongpairoj reported that the difference in the overall omission rates was statistical for each of these two groups.

Lastly, Goad and White (2009) focus on the production of articles¹¹ by 18 Turkish learners at different levels of proficiency: nine “low”,¹² seven intermediate and two advanced. All but one of these participants were university students, plus most of them were taking English courses at university at the time of testing. Though there were no native-speaking controls in the experiment, the data was coded and checked by a group of native and near-native speakers who, as part of their role, had to decide if articles were being omitted in obligatory contexts. Goad and White collected their data using a picture-based elicitation task. Their conclusion was that articles were statistically no more likely to be omitted¹³ in second than first mentions.¹⁴

¹⁰ Although these rates were not directly compared with each other in a formal way, the difference between them is considerable.

¹¹ Goad and White do not distinguish between definite and indefinite articles in their study.

¹² I assume that this corresponds to (upper-)elementary proficiency: it is unlikely that true beginners would have been able to handle Goad and White’s task.

¹³ Although these researchers examined the *suppliance* rather than omission of articles, I am treating their results as comparable to those in the remaining studies reviewed here.

2.1.3 Limitations of previous research

In section 2.1.2, I summarised a handful of key studies which tested two predictions: definite-article omissions will occur at a lower rate in first than second mentions, while (in Trenkic, 2000, 2002 only) definite-article substitutions will occur at a higher rate in first than second mentions. I also showed that, on several counts, the findings obtained therein only tentatively corroborated the first of these predictions. The results of Trenkic (2000, 2002) for lower-proficiency L2ers, Sharma (2005) and Pongpairoj (2008) were broadly as expected; however, the difference between the omission rates in first and second mentions was not statistical in Goad and White (2009), while definite-article omissions occurred at a *higher* rate in first than second mentions in Robertson (2000).

I want to explore the possibility that, at least to some extent, this lack of consensus may well have reflected certain properties of the studies themselves. One such explanation is that the results of Trenkic (2000, 2002) (for both omission and substitution errors) and Pongpairoj (2008) were compromised by the use of a written task in each instance. If we adopt the view that, as a rule, this type of task can be completed under less communicative pressure than a spoken one, then we might expect a written task to allow the learner to draw upon her metalinguistic knowledge more freely than a spoken task. In turn, this means that written data will not reflect the interlanguage competence of the L2er as faithfully as spoken data.¹⁵

However, this explanation for the results obtained by these two researchers is not compelling, for there is no obvious reason why increased access to metalinguistic knowledge should have given rise to the particular pattern of definite-article omission observed in each study. If anything, we might expect the opportunity for more thinking time to have led to a *reduction* in morphological omission in both types of discourse context, thereby decreasing rather than increasing the likelihood that the predicted asymmetry would actually manifest itself. In short, while written tasks have their

¹⁴ More accurately, Goad and White compared article use in first and *subsequent* mentions; in other words, some of the DPs that occurred in anaphoric contexts in their data might not have been second mentions. However, from our point of view, this distinction between second and subsequent mentions is not critical (cf. Avery & Radisić, 2007): either way, definite-article omission rates are predicted to be higher than in first mentions.

¹⁵ Pongpairoj (2008, pp. 193-194) reports that the L2 participants in her study were instructed to do the task as quickly as possible, and were also told that they would be timed. Presumably, this was an attempt on the researcher's part to discourage these L2ers from relying on introspection. Even so, we cannot be sure how much difference (if any) Pongpairoj's strategy actually made. Trenkic (2000, 2002) does not mention if she employed a strategy of this kind in her own study.

drawbacks, the particular asymmetries observed by Trenkic and Pongpairroj cannot be confidently attributed to their use of this type of task per se.

Rather, in Pongpairroj (2008) at least,¹⁶ it is more probable that another type of task effect came into play. In (3) and (4) below, I show several representative texts from the English version of the written-translation task used in this study (examples copied from Pongpairroj, 2008, pp. 193). Recall from section 2.1.2 that Pongpairroj intended to elicit first mentions in associative-anaphora contexts; these DPs appear in italics.

- (3) Linda walked hurriedly into our classroom. She wiped *the blackboard*, and then walked out again.
- (4) I went to a friend's wedding on Sunday. I thought I would be late, but I knew I wasn't when I saw *the groom* waiting outside the church.

There were eight of these texts in the task. In (5) and (6), Pongpairroj intended to elicit second mentions; as before, these DPs are italicised.

- (5) Mary has recently bought a car and a bicycle. She will drive *the car* during the week and will ride *the bicycle* at weekends.
- (6) Yesterday morning I left a bone and a fish in front of my house. First a cat came and ate *the fish*, and then a dog came and took away *the bone*.

Pongpairroj used four such texts in her task, each containing two stimulus DPs.

From our standpoint, what is striking about (5) and (6) is that, in each case, there is a contrast between a pair of nouns. Note that if these texts were read out loud, these nouns would typically be pronounced with additional stress in order to make the contrast more perceptually salient.¹⁷ To reflect the fact that the nouns which are implicated in these contrasts are pronounced in this manner, I will rewrite the texts below with these nouns shown in small capitals in (7) and (8).

¹⁶ Unfortunately, it is not possible to examine in detail the data from any of the other studies reviewed in this chapter.

¹⁷ Strictly speaking, in naturalistic English speech, nouns tend to be pronounced with stress (because they are prosodic words) while articles do not. In the present context, I am talking about pronouncing a noun with more stress than usual specifically because it is part of a contrastive dyad.

- (7) Mary has recently bought a car and a bicycle. She will drive *the CAR* during the WEEK and will ride *the BICYCLE* at WEEKENDS. (= 5)
- (8) Yesterday morning I left a bone and a fish in front of my house. First a CAT came and ate *the FISH*, and then a DOG came and took away *the BONE*. (= 6)

A brief digression is now in order. As we saw in chapter 1, Trenkic (2007) proposed that an article-less L2er is more likely to omit an article in a DP which contains an adjective plus a noun (e.g., ‘the blue door’ → ‘blue door’) than in a simple DP (e.g., ‘the door’ → ‘door’). This asymmetry is hypothesised to occur essentially because, in a DP which contains an adjective plus a noun, the adjective and the article compete for available attentional resources plus the adjective wins out. However, in a simple DP, there is no adjective present, so no competition for these resources is expected.

Along similar lines, I now wish to propose that an article-less L2er will be more likely to omit a definite article in a DP which contains a contrastively-stressed noun (e.g., ‘the car’ in (7)) than in a DP which contains a noun without this property (e.g., ‘the blackboard’ in (3)). My rationale is that the task of stressing a noun contrastively directs more attentional resources towards it than a non-stressed one, so that fewer attentional resources will be allocated to the definite article in a DP containing a stressed noun than in a DP containing a non-stressed one.¹⁸ If this proposal is on track, then we have another possible reason why definite articles were omitted at a higher rate in second than first mentions in Pongpairaj (2008): this was simply an artefact of eliciting second mentions in pairs of contrastively-stressed contexts.

Besides this task effect, recall that Goad and White (2009) pooled indefinite articles together with definite articles when omission rates in first mentions were calculated. Although this is not an inherent defect of Goad and White’s study by any means, it *is* a source of concern from our particular point of view because, as reported by Snape (2006), Trenkic (2007) and others, indefinite articles are generally omitted at a higher rate than definite articles by article-less English L2ers. Thus, we cannot discount the possibility that, in Goad and White (2009), the article-omission rate for first mentions was boosted by the inclusion of at least some indefinite contexts in the pool. If

¹⁸ In an alternative to this account of definite-article omission, Heather Goad (personal communication) suggests that contrastively stressing a noun has the effect of marking it as definite; that is, a noun will not normally be stressed in this way unless it has already been identified as part of a larger group of referents in the discourse. Since the noun is marked as definite via this strategy, the definite article will be rendered redundant on a communicative level.

so, the difference between the article-omission rates in both contexts of interest would have increased, yielding an explanation for why the prediction for omission errors was not borne out in this particular study.

I have discussed two methodological factors which might explain the lack of consensus evident in this body of research. Another issue which merits some discussion is the role played by L2 proficiency in shaping the article-omission patterns that have been reported. Specifically, on the basis of previous research, we cannot tell if the asymmetries of interest are a feature of lower-proficiency L2 production only, or might be discernible at advanced level as well. In Sharma (2005), the participants were not divided up according to proficiency at all, but were treated as a single group. Furthermore, even when advanced participants *were* differentiated from each other in a given study, other concerns arose. In Goad and White's experiment, only two participants were at advanced level, so it is impossible to form a representative picture of the behaviour of this group. Also, each of Trenkic (2000, 2002) and Pongpairoj (2008) targeted groups at intermediate and advanced levels, yet the advanced participants did not behave the same way in the two studies. While both the intermediate and advanced L2ers performed in accordance with expectation in Pongpairoj's study, Trenkic confirmed the relevant prediction for the intermediate participants only.

The current experiment aims to address each of the issues above. Note also that I focus on Korean learners. This is a suitable group because, like the other L1s that have been investigated in research concerned with these asymmetries, Korean lacks an article system of its own. As shown in (9), bare nouns can be interpreted as either definite or indefinite (example adapted from Kim & Lakshmanan, 2008, p. 103).¹⁹

¹⁹ Lyons (1999, p. 290) draws an important distinction between grammatical definiteness (expressed via the filling of Spec DP with a definite article, as in English) and semantic definiteness (expressed via a demonstrative). It is interesting to observe in this context that demonstratives in Korean are occasionally translated into English as definite articles (e.g., Hinson & Park, 2009, p. 40; Song, 1997, p. 209). Trenkic (2004, pp. 147-148) reports that the same phenomenon is known to occur in translations from Serbian as well. A possible reason is that when article-less languages such as these are translated into English, demonstratives are assumed (from an anglocentric perspective, at any rate) to 'stand in for' the definite articles 'missing' from the source language. This approach to translating demonstratives seems questionable because it blurs the distinction between semantic and grammatical definiteness.

- (9) na-nun ecey tosekwan-eyse chayk-ul pilli-ess-ta.²⁰
 I-TOP yesterday library-LOC book-ACC check.out-PST-DECL
 ‘I checked out a/the book (or books) from a/the library (or libraries).’²¹

Yet no attention has been paid to this group within research concerned specifically with either of the asymmetries that interest us in the present experiment.

2.2 Methodology

In section 2.2.1, I supply some background information about the participants in this study. Details of the materials and procedure used for the experimental task follow in section 2.2.2.

2.2.1 Participants

Fourteen intermediate Korean learners of English (KLEs), 14 advanced KLEs, and 14 native-speaking controls (NSs) took part. The intermediate KLEs ranged in age from 20 to 36, with a mean age of 27.1 years; in the advanced group, the age range was 22 to 35 and the mean 27.4 years (for additional information about the Korean participants, see appendix 2.1). These figures show that the two Korean groups were closely matched in terms of both attributes; hence, I was able to control satisfactorily for any impact of age on the differential performance of these two groups. Among the NSs, 11 were students at the University of New England, one was a staff member at the same institution, and two were English language instructors at universities in Korea. These participants ranged in age from 19 to 56.

The process of recruiting the 28 KLEs consisted of two steps. Initially, potential subjects aged approximately 18 to 35 years were identified either through direct observation of their L2 speaking-skills (e.g., in an English-language classroom, if the participant was a university student) or through word of mouth. These KLEs were then invited to take a language test so that their L2 proficiency could be determined more precisely. The test was administered in a one-to-one session lasting 10-15

²⁰ Throughout the present study, I use the slightly simplified version of Yale Romanisation found in Schütze (2001). In this system, the vowel [u] is transcribed as *wu* regardless of its phonological environment. I also supplement this romanisation with phonetic transcription when the need arises.

²¹ Although Korean does have a plural marker, its use is dispreferred (see chapter 3 for a more detailed discussion of this issue).

minutes, and audio-recorded. The test taker's speaking skills were evaluated by me on the basis of this recording.²²

The language test consisted of a series of questions about topics of personal relevance. The main consideration in devising the questions was that they would be likely to elicit tokens of a fairly wide range of structural features. Each question was printed on a small piece of paper, and the pieces were shuffled and placed in a pile face-down in front of the candidate. There were eight questions in all (a complete list is provided in appendix 2.2). In most cases, the test was discontinued after 10 minutes; however, at the discretion of the investigator, it was allowed to run for up to 15 minutes if the test taker had been unusually quiet throughout the test.

The candidate's proficiency was assessed on three independent sub-skills using a set of written descriptors (see appendix 2.3 for the full set). These sub-skills were fluency, grammatical accuracy/range,²³ and pronunciation. For each sub-skill, each of the six proficiency levels from upper advanced down to lower elementary was associated with a particular descriptor. The sub-skills and descriptors were adapted from the public version of the IELTS speaking test (available at <http://www.ielts.org>), but with two main modifications. First, in addition to the three sub-skills named above, the IELTS version includes a subskill related to the candidate's vocabulary use. This was omitted from the version of the test used in experiment 1 for the sake of simplifying the assessment process. The second modification was that, for grammatical accuracy/range and pronunciation, the descriptors in the current version of the test were fleshed out to include representative examples of linguistic features typically encountered at a given level of proficiency. The candidate's overall proficiency rating (e.g., lower advanced) was determined by averaging her ratings on all three sub-skills, with each equally weighted.²⁴

²² It must be counted a limitation of the methodology adopted in this thesis that L2 proficiency was evaluated by only one rater.

²³ When the candidate's performance on this criterion was assessed, I did not take into account her use of any of the functional morphemes that are relevant to this thesis; instead, I focused on grammatical features such as progressive aspect, negation and relative clauses. This was to ensure that the candidate's rating for grammatical accuracy/range was not affected by circularity.

²⁴ Since there was an odd number of sub-skills, it was always possible to determine this overall rating uniquely.

Based on her performance in the test, the candidate was assigned to either the intermediate group or the advanced group,²⁵ or her proficiency was classified as elementary and therefore too low for the current thesis.

2.2.2 Task design and procedure

One task (albeit divided into two phases) was used for all four experiments reported in this thesis. In this section, I provide details of the materials and procedure used in the task. Sections 2.2.2.1 to 2.2.2.3 describe some of its general features. Section 2.2.2.4 deals more particularly with the stimulus DPs used in experiment 1.

2.2.2.1 Overview

The data for this thesis was collected using a combined elicited-imitation (EI) and story-retell (SR) task loosely adapted from Snape (2006); the task was divided into two phases for the sake of triangulation (I will say more about the use of two tasks shortly). Abbreviated versions of the task were piloted with 32 intermediate Chinese speakers of English studying at the English Language Centre at the University of New England, and with 28 intermediate Korean speakers of English enrolled as undergraduate students at Sejong University in Korea. Significant changes were made to the design of the task after each pilot run; in particular, the set of stimulus nouns was increased.

The task was based on a set of 27 experimental story-texts plus three warm-up texts (for the full set of experimental texts, see appendix 2.4). These 30 texts were completed over three sessions; 10 texts were covered per session. In each session, story 1 was included as a warm-up; in the first session only, this story also served as a training run in the procedure used throughout the task.²⁶ To reduce the risk of fatigue, short breaks were incorporated into each session after stories 2, 4, 6 and 8. To minimise any ordering effects, two versions of the task were created, each based on a different semi-randomised ordering of the 27 experimental stories. These two versions of the whole task were given to equal numbers of participants in each of the two KLE groups plus the NS group. For the KLEs, all written instructions for the task procedure were

²⁵ That is, I disregarded the distinction between ‘lower’ and ‘upper’ levels of proficiency within the intermediate or advanced range, and simply grouped participants at these two levels together.

²⁶ The data from story 1 was discarded later.

translated into Korean; the NSs used a version of the task with instructions written in English.

The procedure associated with each story text was as follows. First, each Korean participant was shown a list of vocabulary items from the text.²⁷ The list contained all of the stimulus nouns in the text, plus any other relatively low-frequency items.²⁸ Note also that each item in the list was accompanied by a Korean gloss. The KLE studied the words and their meanings for one minute, and repeated each English word in the list after the investigator twice. Next, the participant was shown the story text itself. First, she read the whole story silently once; then she listened to a recording of the story read by a native speaker, and read the whole story silently again as she listened. The EI phase came after that. Here, the participant listened to a recording of each sentence in the story and repeated the sentence.²⁹ Last, the participant completed the SR phase of the task. She was shown a slide containing some keywords from the story. Using all of the keywords to help her, the participant retold the whole story once. She was also asked to imagine that she was telling the story to someone who had never heard it before. The point of this instruction was to discourage the participant from treating what was intended to be new information as if it were old instead, and using definite articles in place of indefinite articles as a result (Snape, 2006, pp. 206-207).

The task was set up as a PowerPoint slideshow, and presented to the participant one-to-one on a laptop computer. The investigator audio-recorded the participant's spoken production throughout each session on his laptop using the freeware application Audacity plus a Samson Audio CO1U microphone. For the KLEs, each session typically lasted 35-45 minutes, so that the whole task ran for about 120 minutes; the NSs were usually able to complete the entire task in under 90 minutes. At the end of the third session, the participant was compensated for her time and effort.

The recordings were subsequently transcribed. Apart from experiment 2, the focus of each experiment in this thesis is simply the omission or substitution of functional morphology rather than any phonetic characteristics of this item, so an

²⁷ This step was skipped for the NSs.

²⁸ While word frequency was controlled in a formal way for the stimulus nouns in this experiment (see fn. 34), a less formal approach was deemed sufficient for the remaining words in the story texts. Therefore, to optimise comparability across the vocabulary lists used in the task, I ensured that each list contained roughly the same ratio of stimulus nouns to other items. (When compiling these lists, I considered only the lexical frequency of each word that occurred in the story text, not its status as a stimulus or non-stimulus item. For this reason, some of the stimulus nouns appeared in the lists while others did not.)

²⁹ The participant was not shown any written forms (whether inflected or uninflected) while repeating the sentences.

orthographic approach to transcription seemed adequate for the present experiment. Whenever a participant self-corrected an utterance, only the self-corrected version of the utterance was considered for analysis. Mispronunciations of stimulus items were overlooked if it seemed unlikely that these errors could have had a significant impact on how the relevant functional morpheme was produced (e.g., ‘dottle’ for ‘bottle’).

The next step involved calculating and then statistically analysing the rates of omission or substitution of definite articles for each participant in each of the contexts of interest. When calculating omission rates, I focused only on the opposition between ‘omitted’ and ‘supplied’ in an obligatory context, so that other types of production (including substitutions of indefinite articles for definite ones) were excluded from this calculation. Specifically, this meant that the omission rate was X in the equation $X = Y/(Y+Z)$, where Y was the number of cases in which the morpheme was omitted, and Z was the number of cases in which it was supplied. The rates at which indefinite articles were substituted for definite ones were determined using the same basic procedure. In this instance, the opposition was between ‘substituted’ and ‘not substituted’.³⁰

In table 2.3, I exemplify this approach by showing how participant IK4 (IK = intermediate Korean) used definite articles in first-mention contexts in experiment 1.³¹ The column labelled ‘production’ shows what IK4 actually produced where the definite article was required, while each of the columns labelled ‘coding’ indicates how the data was classified for the purpose of determining the omission or substitution rate.

case	stimulus DP	production	coding (omission)	coding (substitution)
1	the floor (1.2)	∅	omitted	-
2	the door (3.2)	∅	omitted	-
3	the garden (3.4)	∅	omitted	-
4	the trigger (13.5)	a	-	substituted
5	the desk (14.5)	his	-	-
6	the bottle (16.5)	the	supplied	not substituted
7	the bucket (24.3)	the	supplied	not substituted

Table 2.3: Productions for participant IK4 in first-mention contexts

³⁰ An alternative approach might have been to use the equation $X = Y/(Y+Z+A)$, where Y and Z were as before, and A was the number of other cases (including ones in which no noun was produced). The main rationale for not factoring A into this calculation was that, relatively speaking, there were a large number of other productions in the data. (Indeed, for some stimulus DPs (especially in the EI data), no noun (and therefore no determiner of any kind) was produced in the context of interest.) Hence, if A had been included in the calculation, the omission or substitution rate might have been affected appreciably.

³¹ The numbers in parentheses refer to the locations of the stimuli in the story texts in appendix 2.4.

For this participant, it can be verified that the omission rate was 3/5, or .60, and the substitution rate 1/3, or .33.

2.2.2.2 *Story texts*

The following features of the design of the texts are noteworthy:

- (i) The texts were controlled for length such that each story was 70-79 words and 6-8 sentences long, plus each sentence contained 12-17 syllables. These restrictions were intended to keep the cognitive demands of the task down to a manageable level, while also making it difficult for the participant to 'echo' the sentence without parsing it structurally (Gass & Mackey, 2007, p. 77).
- (ii) The ideational content of each text was kept as simple and believable as possible in real-world terms. Presumably, a text describing highly complex and improbable situations and events could prove difficult to recall, and this in turn could adversely affect the production of the morphemes of interest. At the same time, this pursuit of simplicity and believability had to be balanced against the more fundamental desideratum that *all* of the stimuli in this experiment be included in the 27 texts which comprised the task proper.
- (iii) The stimulus DPs were relatively freely dispersed throughout the texts rather than crowded together.

2.2.2.3 *Keywords*

As mentioned in section 2.2.2.1, the SR phase of the task required the participants to retell each story using a set of keywords extracted from the text (I will provide examples of a story text plus its associated set of keywords in section 2.2.2.4). Each set was designed in accordance with the principles below.

- (i) The keywords in the set were presented in the order in which they occurred in the story itself.
- (ii) Each line of keywords corresponded to one sentence from the story.
- (iii) For the most part, the set of keywords associated with each story consisted of all and only the content words (in particular, nouns, adjectives, adverbs and

lexical verbs) in that story.³² However, a preposition, particle or personal pronoun was retained if a strictly ‘telegraphic’ approach seemed liable to cause confusion. The preposition ‘for’ or ‘from’ was also retained if it immediately followed one of the stimulus items for experiment 2 or 3 (I will explain why in section 3.4).

- (iv) Among the content words in each set of keywords, all of the nouns and verbs were presented to the participant in auditory form with the functional morpheme included in the EI phase, or appeared on the laptop screen in their bare forms in the SR phase.³³ This uniformity helped to make the results obtained from contrasting sets of stimuli as comparable as possible.

2.2.2.4 Stimulus DPs for experiment 1

The 27 experimental texts were seeded with stimulus DPs in first- and second-mention contexts. Some important characteristics of these DPs follow.

- (i) There were seven stimulus DPs in each type of context.
- (ii) For the sake of consistency, I used only associative-anaphora contexts for the first mentions. In this respect, my approach followed Pongpairoj’s (2008).
- (iii) Each stimulus had the structure (Art +) N (e.g., ‘the wound’). As we saw in chapter 1, Trenkic (2007) proposed that L2ers from article-less language backgrounds will omit articles at different rates in DPs with the structures Art + Adj + N and Art + N. Hence, it was important to prevent any definite-article omissions that were caused by the inclusion of an adjective in the DP rather than by the factors under investigation in experiment 1.
- (iv) Again for consistency, each stimulus DP was located post-verbally. According to Trenkic (2000, 2002), definite articles are omitted at different rates in DPs which occur in topic position and in non-topic DPs. Trenkic ascribes this asymmetry to the fact that, like definite articles in second-mention DPs,

³² By implication, the keywords included all of the stimulus items which happened to be located in that particular story.

³³ We can now return to the issue of triangulation. Note that the data might be subject to a response bias towards the production of bare forms in the SR phase, since the participant is shown bare forms in this phase of the task. Thus, by dividing the task into these two complementary phases, I was not only able to triangulate my approach in general terms: I was also able to address the problem of response bias in the task as a whole.

definite articles in topic DPs express old and therefore communicatively redundant information. In English, topic-hood is associated with the preverbal position.

- (v) For each pairing of introductory DP plus second-mention DP, or triggering DP plus first-mention DP, the discourse distance between the two items was kept reasonably constant. If the identifiability of a referent is assumed to ‘decay’ as the discourse proceeds, one might expect definite-article omission to be more likely if a stimulus DP is far away from its triggering/introductory DP than if it is close by (Sharma, 2005, p. 549; Žegarac, 2004, p. 208).
- (vi) None of the nouns in these DPs was contrastively stressed with a noun in another DP. Recall that, in Pongpairaj (2008), contrastively–stressed nouns were used for second but not first mentions. I speculated that this difference may have affected the outcome of Pongpairaj’s study on the assumption that the definite articles in stimulus DPs containing contrastively–stressed nouns were omitted at a higher rate than the definite articles in other stimulus DPs.
- (vii) Each noun was singular and countable. Articles are obligatory with nouns which have both of these properties.
- (viii) The stimulus referents were concrete (or imagible) (e.g., ‘the bottle’) rather than abstract (e.g., ‘the noise’). There is evidence to indicate that the ontological status of the referent has the capacity to influence the rate at which articles are omitted (Trenkic, 2002).
- (ix) Nouns which might be difficult for the KLEs to pronounce were avoided. In the first place, these included low-frequency items.³⁴ If a stimulus item is unfamiliar, there is a possibility that the L2er will attend particularly closely to the task of pronouncing the word, and this hyper-articulation in turn has the potential to increase the rate at which a functional morpheme is omitted. Likewise, because tautosyllabic consonant clusters are illicit in Korean, no words containing three-position onsets (e.g., [spɪŋ]) ‘spring’; onset underlined) were used as stimulus items.³⁵
- (x) Nouns which are more frequently used as verbs were not selected as stimuli. As an illustration of why this property is important, suppose the KLE is

³⁴ For the stimulus items, all decisions about word frequency in this thesis were made on the basis of the frequency counts available at the companion website to Leech, Rayson and Wilson (2001).

³⁵ However, due to a shortage of suitable nouns, words with two-position onsets were not avoided strictly.

required to produce the form ‘the run’. Since ‘run’ is more often used as a verb than a noun, there is some likelihood that the KLE will produce either ‘runs’ or ‘run’ instead of the required form of the word. Even though cases of wrong inflection are excluded from the calculations of omission rates (see section 2.2.2.1), I still needed to try to minimise the incidence of this type of error in order to maximise the amount of data that could actually be used.

- (xi) None of the nouns used as stimuli was more than two syllables long, plus these words were all kept relatively short in orthographic terms. Polysyllabic and/or long words might be expected to tax the L2er’s memory capacity more than words without these characteristics.

To illustrate the features of the task that have been identified so far, I show one of the experimental texts in (10), highlighting those aspects that are specific to experiment 1. The text contains the following items: one second-mention stimulus DP (i.e., ‘the wound’; single underlining) plus its introductory DP (i.e., ‘Vic’s wound’; dashed underlining), and one first-mention stimulus DP (i.e., ‘the bottle’; double underlining) plus its triggering DP (i.e., ‘some medicine’; dotted underlining).^{36,37}

- (10) Vic is an old man who sells flags for a living. Yesterday a rat bit him while he was working. When a nurse tried to cleanse Vic’s wound, he wanted to howl with pain. Then an old doctor had to wrap the wound for him. The nurse brought some medicine, and Vic took a gulp from the bottle. Finally, the gentle old doctor checked his pulse for him.

In (11), I show the set of keywords which corresponds to the sample text in (10). Notice, in particular, the omission of the copula (as this is not a lexical verb) in line 1, the retention of the preposition ‘for’ and the personal pronoun ‘him’ in line 4, and that of the preposition ‘from’ after ‘gulp’ (a stimulus item for experiment 2) in line 5.

³⁶ Like several of the other texts used in the task, the text in (10) contains stimuli from more than one of the experiments conducted in this thesis. To avoid confusion, I have opted to highlight only the stimuli which feature in experiment 1 here.

³⁷ This text is the only one of the 27 used in this study which contained more than one stimulus DP from experiment 1. Among the 27 texts, five others contained stimuli for this experiment, each containing one stimulus only.

- (11) • Vic / old man / sell / flag / for / living
- yesterday / rat / bite / work
 - nurse / try / cleanse / Vic / wound / want / howl / pain
 - then / old doctor / have to / wrap / wound / for him
 - nurse / bring / some / medicine / Vic / take / gulp / from / bottle
 - finally / gentle old doctor / check / pulse / for him

Next, I list the stimulus DPs for the current experiment. The first-mention items are shown in table 2.4 below. This table also includes the sentence context in which each DP appears, plus a reference to its location within the story texts.

stimulus DP	sentence context	reference
the floor	Paul worked in a <u>fruit shop</u> in London for five years. He had to sweep <u>the floor</u> and check the ceiling for rats.	1.2
the door & the garden	Vicki moved into <u>an old house</u> in Madrid yesterday. She bought three locks for <u>the door</u> to keep burglars out. She also bought some mops for the kitchen last week. Her husband got seven ducks for <u>the garden</u> too.	3.2 & 3.4
the trigger	Mike picked up <u>the gun</u> and started to pull <u>the trigger</u> .	13.5
the desk	The things in <u>the office</u> shine very brightly on <u>the desk</u> .	14.5
the bottle	The nurse brought <u>some medicine</u> , and Vic took a gulp from <u>the bottle</u> .	16.5
the bucket	Every day, he milks five cows; then he sells four litres of milk. His cats lick <u>the milk</u> up if it spills from <u>the bucket</u> .	24.3

Table 2.4: First-mention stimuli for experiment 1

In table 2.5, I show the stimulus DPs which occur as second mentions.³⁸

³⁸ Admittedly, the context for each second-mention stimulus DP might strike some readers as a little unnatural. Consider the context for the DP ‘the rock’, for example. Note, in particular, that this referent is introduced into the discourse as a noun within the indefinite DP ‘a big rock’, and that, the second time this referent is mentioned, it is packaged as a noun within the full DP ‘the rock’. Danijela Trenkic (personal communication) points out (though not in direct connection with the design of this task) that before a referent could be relexicalised as a noun in a non-first mention, it would be felicitous to express it as a pronoun; hence, in the present example, a chain of the type ‘a big rock ... it ... the rock’ would be created. While this seems a reasonable criticism of the task used in this thesis, I suggest that this feature is unlikely to have had a significant bearing on either of the comparisons of interest in the present experiment.

stimulus DP	sentence context	reference
the rock	Andy pulled five crabs from a hole inside a <u>big rock</u> . But the crabs very quickly tried to hide behind <u>the rock</u> .	4.5
the tree	He keeps a pet frog in a well by a <u>tree</u> there. He wants to milk five of his goats in a tent beside <u>the tree</u> .	5.3
the lock	Ron bought a <u>lock</u> for the office to keep his things safe. He wants a handyman to install <u>the lock</u> today.	14.7
the wound	When a nurse tried to cleanse <u>Vic's wound</u> , he wanted to howl with pain. Then an old doctor had to wrap <u>the wound</u> for him.	16.4
the cage	Then the tiger broke open <u>its cage</u> with its teeth. Jimmy caught the tiger and put it back in <u>the cage</u> .	25.5
the belt	And her mother gave Lily a <u>belt</u> from Poland. She spent more than fifty dollars on <u>the belt</u> .	26.5
the river	That night, Wendy drove to a <u>river</u> near her house. She tried to drop the heavy new computer in <u>the river</u> .	27.7

Table 2.5: Second-mention stimuli for experiment 1

2.3 Results

The first result that needs to be reported is that the native speakers (NSs) did not omit or substitute any definite articles in this experiment. My conclusion is that any definite-article omissions or substitutions on the part of the KLEs were highly unlikely to reflect any particular properties of the tasks themselves, but can be safely attributed to L2-specific factors instead. This leaves the data from the KLEs. Omission errors are covered in section 2.3.1, and substitution errors in section 2.3.2 (see appendix 2.5 for the relevant data-sets³⁹).

Before we proceed, let me comment on one notable feature of the presentation of data in this thesis. I follow Larson-Hall and Herrington (2010) in making extensive use of boxplots instead of the more conventional barplot for representing data sets visually. The advantage of a boxplot is that it tells the reader about the *distribution* of the scores in a data set; a barplot, in contrast, obscures this property of the data (though the addition of error bars does, admittedly, enhance the amount of information that can be gleaned from the latter type of diagram). In particular, following Larson-Hall (2009), I rely solely on visual inspection of these plots to determine if the data sets involved in a given comparison satisfy the assumption of normality which underlies the use of

³⁹ For the sake of simplicity, these data sets are not completely raw. For example, in the data sets for experiment 1, I only include the productions ‘the’, ‘a’ and ‘∅’. No productions like ‘his’ or ‘that’ are included (cf. table 2.3).

parametric statistical tests in general. Although Larson-Hall does not go so far as to counsel *against* using numerical tests (e.g., the Shapiro-Wilk test) for this purpose, she cautions, citing Wilcox (2003), that such procedures suffer from low power (Larson-Hall, 2009, p. 84). Each boxplot also has an overlaid mean value (indicated by a red diamond) so that the median and mean, both of which are measures of central tendency, can be directly compared. The boxplots were generated using the freeware statistical-programming language R (for a sample boxplot plus code, see appendix 2.6).

2.3.1 Omission errors

Before the prediction for omission errors was tested against the KLE data, one preliminary step was performed.⁴⁰ Recall from section 2.2.2.4 that there were seven stimulus DPs in each of the two discourse contexts of interest. Note especially that even though all 14 stimuli were controlled for properties such as word frequency (to the extent that other competing requirements permitted this), these DPs contained different nouns plus occurred in different contexts within the stories. Thus, there was a possibility that definite articles would be omitted statistically more or less often in some stimulus DPs than in others, and that the intended comparison might be skewed as a result. I attempted to minimise such effects by creating a boxplot for each data set based on the definite-article omission rates for the stimulus DPs in that set (these boxplots are not included in the thesis). Any outliers in the boxplot were then identified as anomalous stimuli and excluded.⁴¹

We now turn our attention to the prediction of the current experiment for omission errors: definite articles will be omitted at a lower rate in first than second mentions (see section 2.1.1). A numerical summary of the omission rates in the two contexts of interest is given in table 2.6.

⁴⁰ This step was carried out as a matter of course for every data set in this thesis.

⁴¹ As appendices 2.5, 3.1 to 3.3, plus 4.1 indicate, this removal of outlying items from the stimulus sets is actually quite a conservative strategy. Many of the relevant data sets are intact; also, in most instances in which anomalous stimuli *are* removed, this step results in the loss of only one such item from a given set. (Within the data sets in the appendices, the columns for the outlying stimuli are shaded out.)

group	phase	mean (SD) ⁴²	
		first mentions	second mentions
intermediate	EI	.12 (.16)	.19 (.18)
	SR	.45 (.27)	.40 (.22)
advanced	EI	.02 (.09)	0 (0)
	SR	.10 (.13)	.06 (.14)

Table 2.6: Omission of definite articles in first and second mentions: numerical summary

This table shows that the prediction of this experiment for omission errors was not supported, as no clear pattern in the results is evident. For this reason, no significance testing will be carried out in this section. Notice that, for the intermediate group, the rate was lower for first than second mentions in the EI phase, but higher for first than second mentions in the SR phase. For the advanced group, the rate was higher for first than second mentions in both phases; however, this trend is undercut by the fact that the mean omission rates in both contexts were low.

The distributions of the scores in all conditions can be seen in the boxplots for the intermediate and advanced data in figures 2.1 and 2.2 respectively.

⁴² Each mean value is the average of all the individual omission-rate scores for the members of that particular group; that is, each member contributed equally to this value.

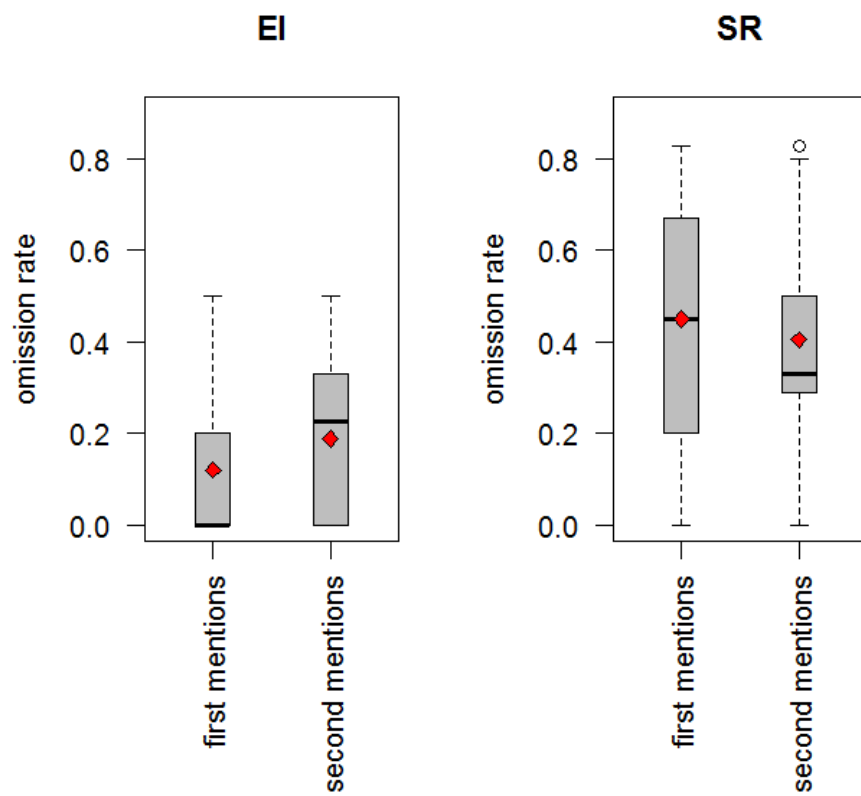


Figure 2.1: Omission of definite articles in first and second mentions: intermediate group

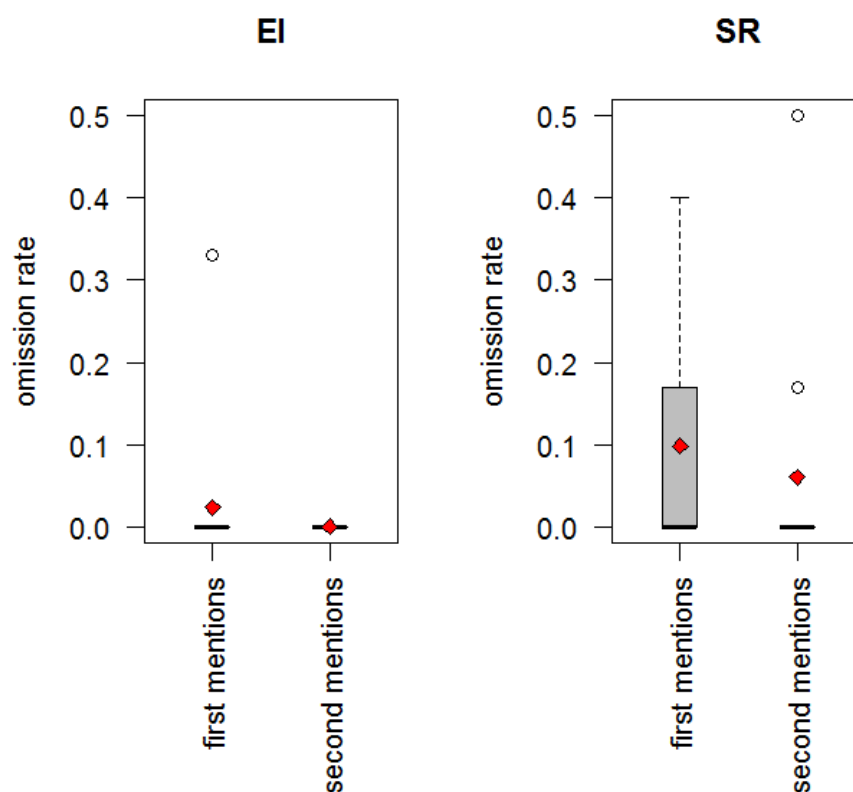


Figure 2.2: Omission of definite articles in first and second mentions: advanced group

2.3.2 Substitution errors

The prediction of the current experiment for substitution errors was that definite articles would be substituted at a higher rate in first than second mentions (see section 2.1.1). I provide a numerical summary of the substitution rates in table 2.7.

group	phase	mean (SD)	
		first mentions	second mentions
intermediate	EI	0 (0)	.06 (.13)
	SR	.10 (.20)	.04 (.09)
advanced	EI	.02 (.07)	.05 (.11)
	SR	.05 (.10)	.08 (.14)

Table 2.7: Substitution of definite articles in first and second mentions: numerical summary

Once again, no clear pattern was discernible for this type of error. Although one could argue that there was a tendency for definite articles to be substituted at a lower rate in first than second mentions, it is important to recognise that the mean substitution rates in all four experimental conditions were low.

I show boxplots for the intermediate and advanced data in figures 2.3 and 2.4 respectively.

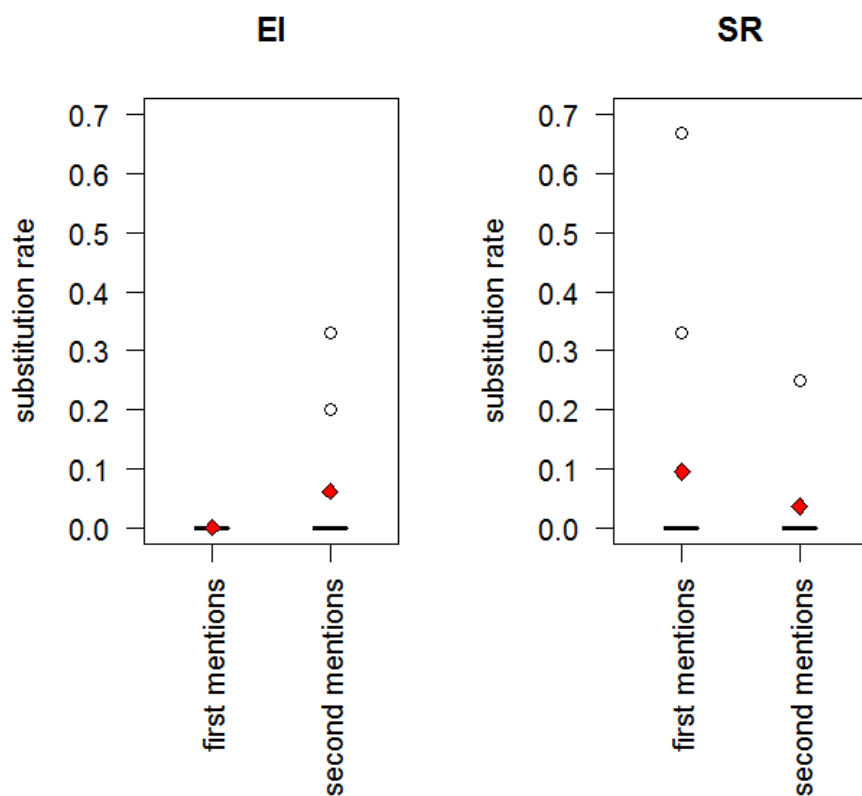


Figure 2.3: Substitution of definite articles in first and second mentions: intermediate group

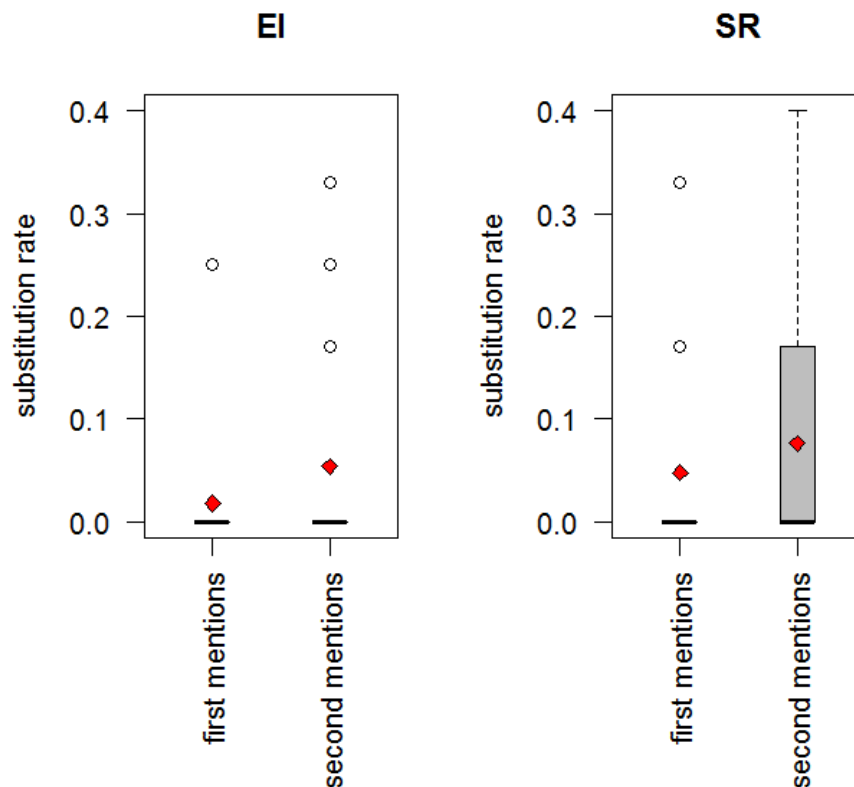


Figure 2.4: Substitution of definite articles in first and second mentions: advanced group

2.4 Discussion

This experiment tested two claims: definite articles will be omitted less often in first than second mentions, plus these items will be substituted by indefinite articles more often in first than second mentions. However, the findings of the experiment were inconclusive for each of these predictions.

There are several possible reasons for this outcome. To begin with, I will show that it is unlikely to be due to stimulus or participant effects. Let us consider the stimulus items first of all. In section 2.2.2, I explained that, for each set of stimuli in this thesis, any items which triggered unusually high or low rates of morphological omission or substitution would be removed from the data before the rate per participant was calculated. On these grounds alone, my view is that the unexpected results of experiment 1 are unlikely to be explicable in terms of such effects.

This impression solidifies when we examine the excluded items themselves. Starting with omission errors, I show in table 2.8 that there were relatively few experimental conditions in which items were removed.

group	phase	mention	item(s)
intermediate	EI	first	the trigger
		second	
	SR	first	
		second	
advanced	EI	first	the bucket
		second	the belt
	SR	first	
		second	the wound

Table 2.8: Omission of definite articles in first and second mentions: excluded stimuli

Table 2.9 shows the excluded stimuli for the substitution errors.

group	phase	mention	Item
intermediate	EI	first	the garden
		second	
	SR	first	
		second	the belt
advanced	EI	first	the bottle
		second	
	SR	first	the bottle
		second	

Table 2.9: Substitution of definite articles in first and second mentions: excluded stimuli

I will now consider participant effects. We can see in table 2.10 (AK = advanced Korean) that, for the omission errors, outlying individual scores occurred in relatively few experimental conditions (see also figures 2.1 and 2.2).

group	phase	mention	participant ID
intermediate	EI	first	
		second	
	SR	first	
		second	IK3
advanced	EI	first	AK2
		second	
	SR	first	
		second	AK5, AK6 and AK14

Table 2.10: Omission of definite articles in first and second mentions: outlying individual scores

Notice also that there was only one outlier in the intermediate data. In the advanced data, each outlier acquired this status because the remaining values in each data set were all zero (or other outlying values).

Similar observations can be made regarding the substitution errors. As table 2.11 shows, outlying scores occurred in more conditions than was the case for omission errors (see also figures 2.3 and 2.4).

group	phase	mention	participant ID
intermediate	EI	first	
		second	IK2, IK3 and IK8
	SR	first	IK2, IK4 and IK9
		second	IK5 and IK10
advanced	EI	first	AK7
		second	AK2, AK7 and AK9
	SR	first	AK7, AK10 and AK12
		second	

Table 2.11: Substitution of definite articles in first and second mentions: outlying individual scores

In each instance, the score became an outlier because the remaining scores were zero (or other outliers). Even so, we might have some grounds for concern over the performance of AK7 in particular, as this participant was an outlier in three experimental conditions. Suppose the scores for AK7 are removed. We then find that, for the advanced group, definite articles were substituted less often in first mentions than in second mentions in each phase of the task (EI phase: mean=0, SD=0 cf. mean=.04, SD=.10; SR phase: mean=.03, SD=.06 cf. mean=.05, SD=.10). Comparison of these values with the corresponding ones in table 2.7 tells us that the aberrant scores for AK7 did not affect the overall pattern of substitution rates to a significant degree.

I have argued that we can safely discount the possibility that stimulus or participant effects are responsible for the unexpected outcome of experiment 1. A more credible reason for these findings is that the task may have been too easy for intermediate and especially advanced Korean learners. At the same time, this explanation suffers from the drawback that, if it were correct, one might have expected the learners to make very few (if any) errors in the task. To explore this possibility, the present experiment could be run again with (upper-)elementary learners. Alternatively, it could be replicated with the same proficiency groups as the present study, but with some alterations to the task to make it more sensitive to differences in participants'

command of definite-article production. Changes that could be made include (but are not limited to) the following: fewer keywords are provided in the SR phase, the sentences are lengthened, or the stories contain additional sentences. The modified task could also be supplemented with one which targets working memory, as the involvement of this aspect of cognition may have confounded the results of the current experiment.

Another possibility is that the use of narrative texts in the current study may have decreased the omission of definite articles in second but not first mentions. Some evidence in favour of this possibility comes from Tarone and Parrish (1988). These authors assumed a classification of article use due to Parrish (1987), who in turn adapted it from an earlier taxonomy found in Huebner (1983), but originally due to Bickerton (1981). This taxonomy was based on the intersection of two binary features: ‘Specific Referent’ and ‘Hearer Knowledge’. From our perspective, only Tarone and Parrish’s category of ‘type 2’ DP is pertinent; the feature setting associated with this is ‘[+ Specific Referent] [+ Hearer Knowledge]’, which is appropriate for the use of definite articles in first or second mentions. I show the various types of definite-article use subsumed by Tarone and Parrish under this category in (12) (adapted from p. 27).

- (12) (a) unique referent or conventionally assumed unique referent (e.g., ‘the Pope’)
- (b) referent physically present (e.g., ‘Ask the guy over there.’)
- (c) referent previously mentioned in the discourse
(e.g., A. ‘So he married a woman from England.’
B. ‘Yes, the woman’s from London.’)
- (d) specific referents assumed known to the hearer (e.g., ‘He went over to the book store.’)

Two properties of this classification are worth noting: (12c) corresponds to the category of ‘subsequent mention’, and there is no category in (12) which corresponds to what I have called the ‘first mention’ use of the definite article throughout the present chapter (since this use is the associative-anaphora type).⁴⁴ Tarone and Parrish found that the

⁴⁴ Tarone and Parrish did, in fact, include a category called ‘first mentions’ in their study; however, this was reserved for articles with the feature setting ‘[+ Specific Referent] [- Hearer Knowledge]’ (e.g., ‘Dad gave me a car’) (p. 27).

participants in their study omitted definite articles at a relatively low rate in type-2 contexts in general. Their explanation was that the narrator strives to accurately mark subsequent mentions of a given referent for anaphoric definiteness so that the listener can follow the story easily.⁴⁵

From our point of view, there are two problems with Tarone and Parrish's proposal. To start with, it flies in the face of Avery and Radisić's (2007) more recent claim that the more often a referent is mentioned in a narrative, the more robustly the definite status of the referent becomes established in the narrative; hence, the referent becomes *less* likely to be marked for anaphoric definiteness the next time it is mentioned. True, insofar as it is based on a single text produced by a single L2er, the evidence that Avery and Radisić put forward is not compelling; yet their claim cannot be disregarded on this basis alone. The second concern is that Tarone and Parrish do not indicate exactly what proportion of the type-2 DPs in their data were subsequent mentions. Consequently, we have no way of precisely gauging the extent to which the low rate of definite-article omissions in type-2 contexts in their study reflected a low rate of omission in subsequent-mention DPs specifically.

These concerns notwithstanding, Tarone and Parrish's proposal does provide us with a neat explanation for the omission-related findings of the current study. If we assume that the use of a narrative task in experiment 1 reduced the omission of articles in second mentions, it is possible to account for the fact that the difference in the rates of definite-article omission between first- and second-mention DPs for each comparison was smaller than anticipated. Indeed, the proposal even explains why, for certain comparisons, definite articles were omitted *more* frequently in first mentions than in second mentions by both proficiency groups. In this light, I suggest that it might be worth replicating experiment 1 using a task in which the production of definite articles is immune to the particular kind of task effect that Tarone and Parrish claimed to have identified.

The last reason for the unexpected results of the current experiment is specific to substitution errors. It is worth considering the possibility that the participants overused definite articles in the SR phase because of the way that the task as a whole

⁴⁵ This suggests that Tarone and Parrish's category of 'subsequent mention' applies more naturally to referents which are marked anaphorically more than just once than to referents marked in this way once only. Hence, it seems implausible that, in the present study, the narrator should have paid anaphoric referents the sort of special attention that Tarone and Parrish allude to. Even so, I assume that Tarone and Parrish's proposal still has some (limited) relevance to the second-mention contexts in experiment 1, and I will proceed on this basis.

was set up. Recall from section 2.2.2.1 that the participant had to retell the story twice: initially in the EI phase, and then again in the SR phase. This means that, by the time the participant reached the latter phase, the story would probably have become quite familiar to her. This property of the task design might have led participants to treat *all* of the DPs in the text as second mentions in the SR phase, thereby increasing the probability that these nouns would be marked as definite. Needless to say, this tendency would have been undesirable from our standpoint because it would have counteracted the pattern of substitution errors anticipated in the study. As mentioned in section 2.2.2.1, the task instructions attempted to discourage overuse of definite articles in the SR phase by asking the participant to imagine that she was telling the story to someone who had never heard it before; however, we cannot be certain that this instruction actually had the intended effect. If some of the participants *did* overuse these items, the lack of support for prediction 2 from the SR data should not be altogether surprising.

In this light, it would be worth testing prediction 2 again with a modified methodology. One strategy would be to change the task such that, rather than retelling an existing story, the participant is required to construct a story for the first time. Under these circumstances, none of the stimulus DPs would constitute old information, and the problem noted above would not arise. By the same token, it might prove difficult to control for certain types of potential confound (e.g., the distance between the introductory DP and the second-mention DP) if this more open-ended approach were taken. More simply, the EI and SR phases could be done on different days, making it more difficult for the participant to remember the content of the story across the two phases of the task.

Apart from indicating various ways in which the present experiment might be profitably replicated, the results of the present experiment also highlight one possible direction for future research. We observed in section 2.1.2 that Pongpairoj's (2008) results were consistent with the prediction for omission errors for intermediate as well as advanced Thai learners. But I also pointed out in the same section that Pongpairoj located the second-mention stimulus nouns in her task in contrastively-stressed pairs, and speculated that this property of her task might have been responsible for creating the asymmetry in definite-article omission reported in her study. I went on to address this possibility in the design of experiment 1 by ensuring that none of the second mentions (or the first mentions, for that matter) was located in a contrastively-stressed context. Yet, as we have seen, the prediction that definite articles would be omitted less

frequently in first than second mentions was not borne out in the current study. One interpretation of this outcome is that the omission of definite articles in Pongpairoj's study was indeed due to contrasts in stress between second-mention nouns. I hasten to add, however, that this explanation for Pongpairoj's results is only speculative at this stage. Further studies are clearly required before we can confidently assess the extent to which sentence stress in general impacts on definite-article omission rates.

Before bringing this section to a close, I want to comment on one intriguing feature of the Korean data which emerged adventitiously from the process of testing the predictions of experiment 1. Even though it has no *direct* bearing on either of the predictions under scrutiny in this chapter, this feature appears to support Trenkic's (2000) broad contention that article-less L2ers make non-target-like links between article forms and article meanings (see section 2.1.1).

As necessary background, note that definite articles are not used in English before the names of countries in target-like fashion except under special circumstances. The first scenario of this type arises when we are referring to a group of islands (e.g., 'the Maldives', 'the Solomons'). Second, in phrases such as 'the China I know and love' or 'the Malaysia of 2011', the speaker is employing the definite article because she is identifying (via the inclusion of a post-modifier of some sort) which conceptual representation of the named country she intends to refer to. There are also exceptional cases like 'the Ukraine', 'the Sudan' or '(the) Lebanon'.⁴⁶ Another relevant characteristic of the story texts used in experiment 1 is that they were replete with PPs of the type 'from + COUNTRY NAME' (I commented on why 'from' (and also 'for') were included within the keywords for the SR phase in section 2.2.2.3).

The feature I want to discuss is that, on occasion, definite articles were inserted before these country names.⁴⁷ In (13), I provide a representative example from the data produced by participant IK3 in the EI phase.⁴⁸

⁴⁶ No items belonging to any of these categories were included in the story texts as stimuli for experiment 1.

⁴⁷ At times, definite articles were also used by the KLEs in this study before the names of *cities* (e.g., 'the London'). (The use of a definite article before a city name is rare in English: the only instance seems to be 'the Hague'.) I am keeping city names out of the present discussion because it was not always possible to be certain that the KLE was thinking of a unique referent when the definite article was oversupplied; for example, compare London, England with London, Canada, but note that there is only one Canberra. In a very small number of cases, definite articles were used before the names of certain participants in the stories too, when these occurred in second-mention contexts (e.g., 'near the Mike'); however, I will not comment further on such cases here on the grounds that, as far as these names were concerned, variables such as number of mentions were not controlled for in the texts. On the same topic, I should also point

- (13) Paul rant hour for his friend from *the Japan*.
(cf. Paul would rant for hours about his boss to a friend from Japan.)

In addition, within the data from this phase, note that oversuppliance occurred more often in the intermediate data (mean=.05, SD=.09) than the advanced data (mean=.01, SD=.04).

It is worth briefly considering why the type of error exemplified in (13) might have occurred. I suggest that the speaker is using the definite article in this sentence because he assumes that, based on a common pool of general knowledge about the world, the hearer (i.e., the researcher, in this case) can uniquely identify the country he is referring to from its name, and he wants to signal this sharing of knowledge explicitly (though the resulting form is, of course, non-target-like in English). In other words, the definite article is being employed here in a manner akin to its wider-situation use (see fn. 4).⁴⁹ For comparative purposes, I provide a target-like example of the use of a definite article in a wider-situation context from Lyons (1999, p. 3) in (14).

- (14) *The moon* was very bright last night.

2.5 Chapter conclusion

In the experiment reported in this chapter, I tested two predictions regarding the omission and substitution of definite articles in first and second mentions by KLEs. On the whole, the results were equivocal for each proficiency group. In response to this overall outcome, I suggested that the experiment could be replicated with the following methodological changes: the experiment is conducted with (upper-)elementary participants, the task is made more challenging, and/or the task is not based on narratives. I also proposed two additional modifications to this task which are specific

out that every case like ‘the Japan’ in (13) in the data was the first (and also only) mention of the country in question within any given story.

⁴⁸ There were more cases of this oversuppliance error in the EI data than in the SR data, so I have focused on the former data set here.

⁴⁹ Another possible explanation for the overuse of definite articles in a phrase such as ‘the Japan’ is that the learner is overgeneralising from the use of this item in a phrase like ‘the U.S.’ to article-less names of countries. The problem with this explanation is that, as we have just seen, only a handful of names of countries contain the definite article. And while a name like ‘the U.S.’ might occur more frequently in naturalistic discourse than many other names of countries, it seems unlikely, as a matter of principle, that a marked pattern such as this one could generalise to the unmarked context.

to testing the prediction for substitution errors: instead of retelling an existing story, the participant has to construct a new one; and/or the EI and SR phases of the task are done on different days. Finally, I identified one implication for future research which flowed directly from the results of the study: we need a better understanding of the role that contrasts in sentence stress play in determining the rate at which definite articles are omitted.

One way to build on experiment 1 less directly would be to study the effects of systematically manipulating some of the variables which were held constant in this study. Three of these are especially noteworthy:

- (i) the distance a second-mention DP is from the DP which introduces the referent into the discourse (Sharma, 2005, p. 549; Žegarac, 2004, p. 208);
- (ii) the linguistic complexity of the material which intervenes between the introductory DP and the stimulus, or between a stimulus and its triggering DP (Gibson, 2000; J. Hawkins, 2004) (I will say more about these metrics in section 4.1.2); and
- (iii) the type of first-mention context used (e.g., associative anaphora (featured in the current experiment) cf. immediate situation).

In the present chapter, we looked at asymmetries in definite-article omission and substitution which were motivated by discourse factors. In chapter 3, we change tack and examine asymmetries in past tense, agreement and plural omission based on contrasts in verb class and stem shape.

Chapter 3

Experiment 2: Tense, agreement and plurals: contrasts in stem length and verb class

3.0 Introduction

As I mentioned in chapter 1, the omission of L2 functional morphology has often been attributed to L1-based deficits in interlanguage representations. Some researchers have located the source of this problem in the syntactic component (Hawkins, R., & Liszka, 2003), while others advocate a prosodic account of morphological omission instead (Goad, White & Steele, 2003; Goad & White, 2004). In experiment 2, I will be concerned with testing the latter theory of variability.

Two contrasts will take on particular significance in this chapter. The first one is between short and long stems. A short stem is one in which the word-final rhyme contains two segments (e.g., ‘tap’ [tæp]; rhyme underlined); however, in a long stem, there are three segments in this part of the syllable (e.g., ‘blink’ [blɪŋk]). In English, regular inflection can attach to a short stem, as in a past-tense form like ‘tapped’ [tæpt], or a long stem, as in a present-simple form such as ‘blinks’ [blɪŋks]. Second, verb class is important in the present experiment because past tense (or perfective) marking can be either regular (e.g., ‘cook’ → ‘cooked’) or irregular (e.g., ‘kneel’ → ‘knelt’).

On the basis of these two contrasts, certain prosodically-driven asymmetries in the omission of past tense, perfective and agreement inflection in L2 English have been predicted in the literature (Goad et al., 2003; Goad & White, 2006b; White, 2008), yet the results have been mixed. Specifically, despite the approximate parity in L2 proficiency between the learners in Goad et al. (2003) and Goad and White (2006b), the findings of these two studies indicate that their respective groups of participants were at quite different stages of L2 development. At the same time, this lack of consensus must be viewed in light of the fact that there were relatively few participants in each

experiment, plus the results of Goad and White (2006b) may have been skewed by task effects. The objective of experiment 2 is to remedy these shortcomings of previous work in this area.

The present study also extends existing research on the Prosodic Transfer Hypothesis (PTH) in general by examining how freely an L1 prosodic representation can be redeployed in the L2. To date, it is unclear if an L1 representation can be decoupled from its associated syntactic construction. In order to explore this issue, I focus specifically on (past) tense, agreement and plural (TAP) inflection. As I shall demonstrate in section 3.1, Korean diverges from English in certain respects vis-à-vis the syntactic and prosodic characteristics of these particular morphemes.

The chapter is organised as follows. In section 3.1, I describe those properties of Korean and English which are relevant to our immediate concerns. I review each of the key studies on this topic in section 3.2. Section 3.3 contains the predictions. The methodology is described in section 3.4. I report the findings in section 3.5, and discuss their implications in section 3.6. The chapter is brought to a close in section 3.7.

3.1 Theoretical background

I cover the syntactic characteristics of TAP inflection in Korean in section 3.1.1. The prosodic representations for these morphemes in Korean and English are examined in section 3.1.2.

3.1.1 Syntactic characteristics of Korean

The facts for tense and agreement are quite straightforward. Verbs are marked for past tense using the morpheme *-ess/-ass*¹, as in (1) (example adapted from H. Lee, 1989, p. 88).

- (1) bom-i o-ass-ta
 spring-NOM come-PST-DECL
 ‘Spring came.’

¹ This choice is conditioned by vowel harmony.

However, there is no explicit signal of agreement. Compare the forms of the verb in (2a), which has a 3rd-person singular subject, and in (2b), which has a 3rd-person plural subject (examples adapted from I. Lee & Ramsey, 2000, pp. 197, 205).²

- (2) (a) Minho-ka Swuni-lul salang-ha-ta
 Minho-NOM Suni-ACC love-do-DECL
 ‘Minho loves Suni.’
- (b) say ssak-tul-i^{3,4} pi-lul kitali-ta
 new shoot-PL-NOM rain-ACC wait-DECL
 ‘The new shoots are waiting for the rain.’

By contrast, Korean plural marking (KPM) is a complex and inadequately understood phenomenon, and an exhaustive treatment is beyond the scope of this thesis (see Lardiere, 2009, for a more wide-ranging examination than is possible here). For our purposes, the following sketch will be sufficient. To begin with, there are two scenarios in which the plural marker *-tul* is obligatory. The first of these arises when a demonstrative is used, as in (3) (example adapted from Suh, 2008, p. 240).

- (3) Haymi-ka ku ai-*(tul)-ul⁵ towa-cwu-ess-ta
 Haemi-NOM that child-PL-ACC help-give-PST-DECL
 ‘Haemi helped those children.’
 (Without *-tul*: ‘Haemi helped that child.’)

The plural marker is also required when the semantic plurality of the noun is important from a discourse perspective. Jae Jung Song (personal communication) observes, for instance, that *-tul* is often used with *salam* ‘person’ when it is necessary to distinguish between people in general and one person, as in (4) (example also from Song).⁶

² In Korean, a verb consisting of a stem plus the declarative suffix is understood to have present time-reference by default.

³ This noun is marked with *-tul* only in order to make its semantic plurality explicit. In practice, as we shall discover shortly, the use of *-tul* as a marker of conventional plurality is dispreferred in most circumstances.

⁴ In this word, orthographic ‘ss’ represents [s’], the tense counterpart of [s].

⁵ The accusative marker has two allomorphs: *-ul* and *-lul* (cf. (2)). The former allomorph occurs after a consonant.

⁶ A very similar example, also using *salam*, can be found in Lee and Ramsey (2000, p. 100).

- (4) salam-tul-i yojuum-un ton-bakkey mol-l-a!
 person-PL-NOM these.days-TOP money-except not.know-FL-INTIM.DECL⁷
 ‘These days people only think about money!’

Otherwise, *-tul* is used only infrequently. When the noun is modified by a numeral or another quantifier, plurality is signaled by an appropriate classifier; *-tul* then becomes redundant as a number marker and is not normally included. The awkwardness of *-tul* in this context is illustrated in (5) (example adapted from Choi, 2005, p. 26).

- (5) ?? ai-tul twu myeng-i jip-ey iss-ta
 child-PL two CL-NOM home-LOC exist-DECL
 ‘There are two children at home.’

Elsewhere, the use of *-tul* can be described as optional, though even this characterisation might give a misleading impression of how often it is actually employed in spontaneous discourse. Song (2005, p. 71) sums up the situation with KPM thus:

The plural marker *-tul* is said [(e.g., in Song, 1997, p. 206)] to occur mainly with human nouns, less frequently with non-human animate nouns and far less frequently with inanimate nouns. However, plural marking is not commonly used even with human nouns, and, in fact, it is usually left out [except in a case like (3) or (4) above].

Despite the relative infrequency with which KPM is utilised in naturalistic discourse, it is worth mentioning the distinction between what are commonly labeled the ‘intrinsic’ and ‘extrinsic’ types of plural-marking in this language. As we shall see in section 3.1.2.3, the latter construction will be used as an important tool in determining which prosodic representations are available in this language. Extrinsic plural-marking works like this: if a subject is marked for plurality intrinsically, *-tul* can ‘spread’ optionally to other elements in the clause, including non-nominal constituents

⁷ The base form of the verb ‘not know’ is *molu-*. In *mol-l-*, the second [l] is a filler of some sort (Jae Jung Song, personal communication.).

such as adverbs and verbs, thereby triggering certain changes in the interpretation of the clause in which it occurs. I exemplify this process in (6) (example adapted from Song, 1997, p. 208). Notice here that *-tul* attaches not only to the subject *ai* ‘child’ but also to the object *mwul* ‘water’ even though the latter is a mass noun.

- (6) ai-tul-i mwul(-tul)-ul masi-ess-ta
 child-PL-NOM water-PL-ACC drink-PST-DECL
 ‘The children drank water.’

Song explains that, in the absence of extrinsic plural-marking, the interpretation of (6) could be that most of the children drank water; for example, perhaps eight or nine of them drank water and the rest drank something else. However, if extrinsic plural-marking is used, the interpretation can only be that *each* of the ten children drank water; in other words, extrinsic *-tul* implies a distributive interpretation of the event over the agents who are implicated in that event. On this basis, I will treat the ‘extrinsic’ plural as a marker of distributiveness rather than conventional plurality.⁸

3.1.2 Prosodic representations

In section 3.1.2.1, I present the model of prosodic structure that will be assumed in this chapter. I cover the prosodic representation of TAP inflection in English in section 3.1.2.2. The relevant Korean structures are dealt with in section 3.1.2.3.

3.1.2.1 The Prosodic Hierarchy

I will be assuming that syllables are organised into higher prosodic structure (cf. Nespor & Vogel, 1986; Selkirk, 1996; and others). This hierarchical model is depicted in figure 3.1 (from Goad & White, 2004, p. 126).

⁸ In a different analysis of KPM, Sohn (1999) identifies two different markers, a plural suffix (used intrinsically) and a plural particle (used extrinsically). Given that these two putatively distinct markers are homophonous, I suggest that the use of an intrinsic/extrinsic distinction based on function rather than word class is preferable. Note also that although Sohn calls one of these markers a suffix and the other a particle, he does not offer any evidence that the two markers attach to a host differently in prosodic terms (as they should under his analysis).

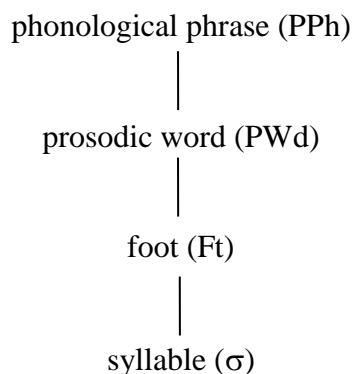
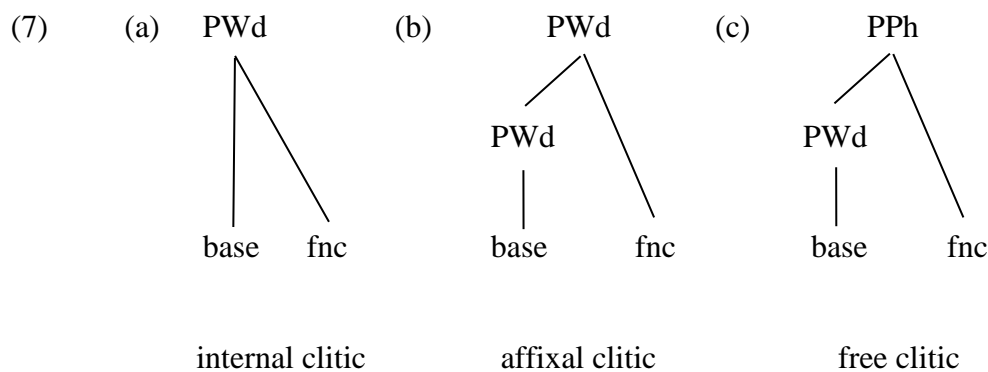


Figure 3.1: The Prosodic Hierarchy

The model assumes that lexical words are PWds, but that non-lexical material can be prosodified in various ways. Three such representations must be identified: internal clitic (7a), affixal clitic (7b), and free clitic (7c) (representations from Selkirk, 1996, p. 188; fnc = functional element).^{9,10}



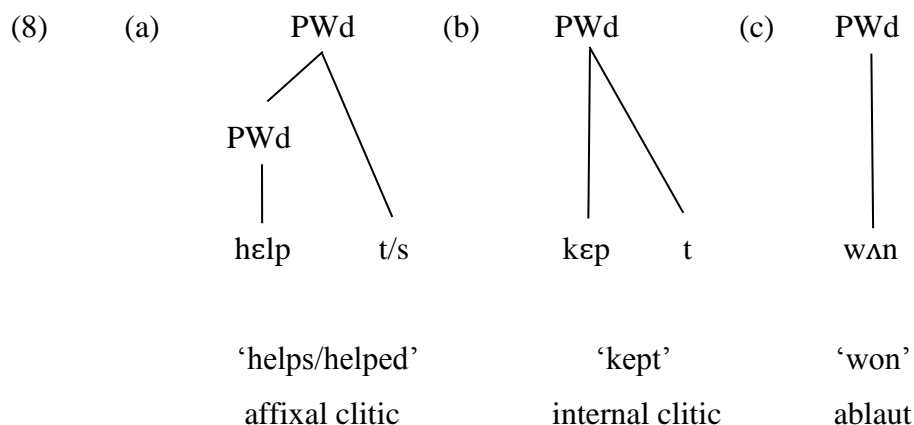
Notice that internal clitics are incorporated within the PWd of the base, affixal clitics are adjoined to the PWd, and free clitics are attached directly to the PPh.

3.1.2.2 English

The representations for TAP inflection in English are shown in (8) (examples adapted from Goad & White, 2006b, p. 247).

⁹ The relative linear ordering of base and functional material may vary.

¹⁰ Strictly speaking, it is also possible for a functional morpheme to constitute a PWd in its own right. This structure is not relevant to the present experiment.



As these examples show, tense inflection is adjoined to the PWd as an affixal clitic for regular inflection, as in (8a),¹¹ or incorporated within the PWd for irregular inflection; in the latter case, tense marking can be realised via pseudo-inflection as an internal clitic, as in (8b), or via ablaut, as in (8c). For agreement inflection, only PWd adjunction is possible (since this type of inflection is always regular), as in (8a). Plural inflection follows the same pattern as agreement if it is regular; irregular plurals follow the same pattern as irregular verbs.

The prosodic analyses in (8a) and (8b) are corroborated mainly by evidence from syllabification patterns (Goad & White, 2006b, p. 248); no argumentation is required for (8c) as the structure of this item is trivially obvious. Regarding (8a), Goad and White point out that while three-position rhymes occur PWd-finally in monomorphemic words in English (e.g., ‘apt’ [æpt]), words with four-position rhymes occur mostly as regular-inflected forms (e.g. [hɛlpt] ‘helped’). With a few exceptions (e.g., [tʃaɪld] ‘child’), there are no monomorphemic words with this phonological shape in English (e.g., *[pɪlkt], *[faɪsp]) (or indeed in languages generally). This contrast in the distribution of words with four-position rhymes suggests that the PWd-final rhyme of a monomorphemic word in English can contain three positions at most. But a regular-inflected form like [hɛlpt] has a four-position rhyme. It follows that the inflection in this word lies *outside* the PWd; specifically, it is tacked onto the verb stem via PWd adjunction.^{12,13} In a pseudo-inflected form, by contrast, phonological processes

¹¹ Regular perfective-inflection, which features in Goad and White (2006b), is prosodified using the same structure.

¹² There is also the possibility that TAP inflection attaches as a free clitic, as in [[hɛlp]_{PWd} t]_{PPH} for instance. This analysis is discounted by Goad et al. (2003, p. 249) for tense morphology using an argument due to Hayes (1989, p. 207). Hayes observes that the stem-final [t] is lightly aspirated in ‘visit-ed’ but not in ‘visit it’, and takes this difference in aspiration to indicate that the past-tense suffix in ‘visit-ed’ and the pronoun ‘it’ in ‘visit it’ do not have the same prosodic status. This argumentation can be readily extended to other types of TAP inflection.

such as vowel-shortening in the ‘keep-kept’ ([ki:p]-[kɛpt]) alternation (triggered by the attachment of the past-tense suffix [t]) indicate that the rhyme is being limited to three positions only. As this is the length of a rhyme in a monomorphemic word (cf. a parallel form like [ədɛpt]_{PWd} ‘adept’), we can conclude that the [t] suffix in a form like [kɛpt] is organised PWd-internally.

Concerning pseudo-inflection again, Goad and White’s arguments can be supplemented by evidence based on the prosodic status of the host. If functional material is to be *adjoined* to its host, this host must (minimally) have the status of an independent PWd (see (8a)). But a form like *[kɛp] (in ‘kept’) cannot stand on its own; therefore, it does not itself form a PWd.¹⁴ Hence, irregular inflection in English must be incorporated into the PWd which hosts it (see (8b)), rather than adjoined to an existing PWd.

3.1.2.3 Korean

We saw in section 3.1.2.2 that, in English, regular inflection is adjoined to the PWd, while irregular inflection is incorporated into the PWd. The objective of the current section is to determine if each of these representations is available in Korean as well.

Before we get started, it is worth noting that there appears to be a dearth of research literature which is immediately relevant to this section; moreover, even within the work that *has* been conducted on the topic of prosodic representations in Korean, there is some disagreement over which representations are found in which domains of the language. In O. Kang (1992), for example, functional morphology is adjoined to the PWd for both verbs and nouns; however, E. Kang (2004, p. 223) takes the view that nominal morphology can attach via either PWd adjunction or PWd-internal incorporation,¹⁵ while verbal morphology is PWd-internal only. What is more, neither researcher offers compelling evidence to support her position.

Based on certain asymmetries in the attachment of functional morphology to verbs versus nouns, I will now argue that verbal inflection is incorporated within the PWd while nominal morphology adheres to its host more loosely.¹⁶ Let us begin by

¹³ This does not mean, however, that regular inflection is insensitive to any phonological processes that might apply between the stem and the affix. In particular, there must be voicing agreement between a stem-final obstruent and this morpheme (e.g., [hɛlpt] cf. *[hɛlpd]).

¹⁴ I am assuming here that *[kɛp] is part of the pseudo-inflected form [kɛpt]_{PWd}. In terms of moraic structure, the homophonous nonce form [kɛp] qualifies as a PWd (cf. a parallel form like [stɛp]_{PWd}).

¹⁵ It will become apparent shortly why this author claims that two distinct representations are needed here.

¹⁶ The question of exactly how this morphology is prosodified will be answered later in this section.

considering some examples of what happens to hiatus in this language. Notice that hiatus is resolved in (9a) through deletion of the stem-final vowel /i/;¹⁷ however, it is preserved in (9b) (examples adapted from Ko, 2006, p. 199).¹⁸

- | | | | | | | |
|-----|-----|----|------|---------------------------|--------------------------|--------------------|
| (9) | (a) | V: | (i) | /kənni + ə/ | [kən.nə] | ‘to cross + CONJ’ |
| | | | (ii) | /k ^h i + əss/ | [k ^h əss] | ‘to be tall + PST’ |
| | (b) | N: | (i) | /ki + eke/ | [ki.e.ge] ¹⁹ | ‘him + DAT’ |
| | | | (ii) | /milk ^h i + e/ | [mil.k ^h i.e] | ‘milk + LOC’ |

On a theoretical level, my analysis of this asymmetry owes a great deal to Piggott and Newell’s (2006) (P&N’s) treatment of a similar phenomenon in Ojibwa (Eastern Algonquian), so I will describe their argumentation in detail. The Ojibwa pattern is illustrated in (10) (examples from Piggott, 2008, pp. 111, 116).²⁰

- | | | | | | | |
|------|-----|----|------|-----------------------|----------------|--|
| (10) | (a) | N: | (i) | /name: + ag/ | [name:g] | ‘sturgeon + PL’ |
| | | | (ii) | /ni + name: + im/ | [niname:m] | ‘1P + sturgeon + POSS’ |
| | (b) | V: | (i) | /gi: + a:gamose: + Ø/ | [gi:a:gamose:] | ‘PST + walk.in.snowshoes + FIN’ ²¹ ‘he walked in snowshoes’ |
| | | | (ii) | /ini + a:gamose: + Ø/ | [inia:gamose:] | ‘away.from.spkr. + walk.in.snowshoes + FIN’
‘he walks there in snowshoes’ |

In (10a), the initial vowel in the plural or possessive suffix is deleted after a vowel-final noun stem; however, hiatus is preserved in (10b).

A key aspect of P&N’s approach is that it conflates two distinct theories of linguistic structure and interpretation. The first of these, Distributed Morphology (Halle & Marantz, 1993), holds that the internal structure of words is built up according to the

¹⁷ Vowel deletion in Korean only ever happens with this particular vowel.

¹⁸ One noteworthy feature of (9) is that, for the verbal examples in (a), the initial vowel in the functional morpheme is /ə/, while this vowel is /e/ in each nominal example in (b). Admittedly, it would have been preferable to use contrasting pairs of examples which featured the same vowel in both domains; however, to the best of my knowledge, no such pairs are available in the language.

¹⁹ The surface form is [ki.e.ge] rather than [ki.e.ke] because unaspirated stops undergo voicing between sonorants. This happens in other examples in this section as well.

²⁰ As comparison of (9) and (10) reveals, the parallelism between the two languages is not perfect: hiatus is resolved in the verbal domain in Korean, but in the nominal domain in Ojibwa. From our standpoint, this cross-linguistic mismatch is not significant.

²¹ Ojibwa has a class of morphemes called ‘finals’ whose properties are not relevant in the present context.

same sorts of principles which are responsible for generating the structure of sentences. This abstract structure is spelled out, at least in part, via insertion of the lexical items which constitute the surface forms of words. The second construct underpinning P&N's analysis is phase theory (Chomsky, 2001, 2005; Nissenbaum, 2000). The core premise of this theory is that the phonological and semantic interpretation of abstract syntactic representations at PF and LF respectively occurs in step-by-step fashion. Moreover, this process is cyclic; thus, phonological and semantic interpretations derived in cycle n are transferred to cycle $n+1$. Note also that P&N adopt an *extended* version of phase theory. Whereas only CP and transitive vP are identified as phases in its original formulation, P&N assume (in keeping with the tenets of Distributed Morphology) that the syntactic constituents of these projections (e.g., nouns, verbs and adjectives) qualify as phases too.

With this theoretical framework in place, P&N offer an analysis of the Ojibwa pattern exemplified in (10). Their basic contention is that vowel hiatus is resolved when the V-V sequence occurs *within a phase*, but tolerated when it occurs *in separate phases*. Thus, a word like *name:g* 'sturgeons' (10a(i)) will be spelled out as a single phase, so hiatus must be avoided in this word in order to ensure phonological well-formedness. On the other hand, in *gi:a:gamose:* 'he walked in snowshoes' (10b(i)), for example, the verb root *a:gamose:* has the status of a phase; accordingly, it is spelled out at PF separately from the past-tense prefix *gi*. But this means that the initial vowel in the root *a:gamose:* is invisible to the final vowel in the prefix *gi*; hence, no violation of a ban on V-V sequences is incurred, and hiatus is happily allowed.

P&N's phase-based analysis has clear ramifications for the prosodic representation of functional morphology in Korean. Note that if a word is spelled out in a single phase, any functional morphology attached to this word will necessarily lie *within* the PWd; however, if a stem and a functional morpheme are spelt out in different phases, this morpheme must lie *outside* the PWd that has already been spelt out in the previous phase. It follows that, in Korean, functional morphology is incorporated within the PWd in the verbal domain, but attaches more loosely to its host in the nominal domain—as claimed above.

Similar asymmetries in the operation of hiatus between the verbal and nominal domains can be found elsewhere in Korean. Observe that hiatus is resolved through

vowel coalescence in (11a), but tolerated in (11b) (examples adapted from Ko, 2006, pp. 199-200).²²

(11)	(a)	V:	(i)	/po + i + ta/	[pœ.da]	‘to see + CAUS + DECL’
			(ii)	/c ^h a + i + ta/	[c ^h æ.da]	‘to kick + PASS + DECL’
	(b)	N:	(i)	/co + ita/	[co.i.da]	‘millet + COP’
			(ii)	/c ^h a + ita/	[c ^h a.i.da]	‘car + COP’

In like manner, glide formation occurs in (12a) but not in (12b) (example (12a(ii)) from Sun-Ah Jun; remaining examples in (12) adapted from Ko, 2006, pp. 198-199).²³

(12)	(a)	V:	(i)	/kali + ə/	[ka.rjə] ²⁴	‘to cover + CONJ’
			(ii)	/bo + əla/	[bwa.ra] ²⁵	‘to look + IMP’
	(b)	N:	(i)	/tali + esə/	[ta.ri.e.sə]	‘bridge + LOC’
			(ii)	/nuku + eke/	[nu.gu.e.ge]	‘who + DAT’

I assume that the version of phase theory utilised by P&N can be readily applied to (11) and (12) as well. If so, these examples constitute additional evidence for the prosodic representations discussed so far in this section.

Before we continue, let me point out that none of the processes of vowel deletion, vowel coalescence or glide formation illustrated in (9a), (11a) or (12a) respectively *must* occur: the uncontracted counterparts to these forms are also attested. On the other hand, there is no optionality in (9b), (11b) or (12b), since the two vowels involved in each case belong to forms that are spelt out in different phases. In light of this contrast, I take the view that verbal morphology is organised in only one way in Korean (i.e., via incorporation within the PWd), and that the alternation in the surface

²² An example such as (9a), in which we have /i + ə/ → [ə], could be analysed as involving coalescence rather than /i/-deletion; after all, both /i/ and /ə/ are central vowels, plus lower height is preserved in the coalesced vowel [ə]. This is essentially the position taken by Y. Lee (1993), who treats /i/-deletion as a particular type of vowel coalescence. Note, however, that the coalesced vowel in (9a) is identical to one of the input vowels, whereas in (11a) the coalesced vowel differs from both of the input vowels. I assume this is the reason why the loss of /i/ in an example like (9a) is treated as a case of deletion rather than coalescence in Ko (2006), Yun (2008) and other studies. I have opted to follow the same approach as these authors on the same basis.

²³ Glide formation occurs here because the first of the two vowels involved in this process is higher than the second one (i.e., /i + ə/), plus the first vowel has a glide counterpart (e.g., [i] cf. [j]). Only the second of these conditions is met in a case like /i + ə/ in (9a).

²⁴ The phoneme /l/ surfaces as [r] intervocally in this language.

²⁵ The initial vowel /ə/ in the suffix is realised as [a] because of vowel harmony.

form arises because each process only applies optionally. That is, on the grounds of parsimony at the very least, I reject the logically-possible alternative that there are two distinct prosodic representations available for verbal inflection in this language, each associated with one of the alternating forms (*pace* Kang, 2004, p. 223). Nor, in my estimation, does this optionality detract from the significance of each process as a clue to the prosodic representation of verbal morphology in Korean.²⁶

We have seen that hiatus is resolved in verbs in various ways, but tolerated in nouns. I will now exemplify various phonological processes which, by contrast, occur in nouns but not verbs.²⁷ In (13), a stem-final stop in a noun loses aspiration even when the following segment is a vowel; however, when the host is a verb, aspiration is retained stem-finally (examples adapted from Ko, 2006, pp. 200-201):

- | | | | | | | |
|------|-----|----|------|--------------------------|-------------------------|---------------------|
| (13) | (a) | N: | (i) | /mulip ^h + e/ | [mu.li.be] | ‘knee + LOC’ |
| | | | (ii) | /puək ^h + in/ | [pu.ə.gin] | ‘kitchen + TOP’ |
| | (b) | V: | (i) | /kip ^h + ə/ | [ki.p ^h ə] | ‘to be deep + CONJ’ |
| | | | (ii) | /pæt ^h + il/ | [pæt ^h + il] | ‘to spit + REL’ |

Similarly, when a final cluster in a noun occurs before a vowel-initial suffix, the cluster can be reduced to the form that it would take if it were a coda; however, a final cluster in a verb surfaces intact when it occurs in the same context. This asymmetry is shown in (14) (examples adapted from Ko, 2006, pp. 201, 212).

- | | | | | | | |
|------|-----|----|------|-------------|------------------------|----------------------|
| (14) | (a) | N: | (i) | /kaps + i/ | [ka.bi] | ‘price + NOM’ |
| | | | (ii) | /hilk + in/ | [hi.gin] | ‘soil + TOP’ |
| | (b) | V: | (i) | /əps + i/ | [əp.s’i] ²⁸ | ‘not to exist + ADV’ |
| | | | (ii) | /kilk + ə/ | [kil.gə] | ‘to scratch + CONJ’ |

²⁶ However, what *drives* this optionality is more difficult to pin down. The main factor conditioning the choice of variant seems to be the level of formality of the utterance. Sun-Ah Jun (personal communication) opines that, for verbal morphology, both variants of a given form exist within the speaker’s grammar, but that the variant in which hiatus is resolved (e.g., *karjə* in (12a(i))) might be regarded as more casual than its counterpart (i.e., *kariə*). Jun also suggests that this choice is unlikely to be influenced by speech rate.

²⁷ Like the various processes of hiatus resolution exemplified in (9a), (11a) and (12a), these nominal processes apply only optionally.

²⁸ This form surfaces as [əps’i] rather than [əpsi] because of post-obstruent tensing.

The contrasts in (13) and (14) indicate that, for nouns but not verbs, the coda of the stem is invisible to the initial vowel in the functional morpheme. Once again, the version of phase theory adopted by P&N provides us with an explanation for this asymmetry: functional morphology is organised PWd-internally in the verbal domain, but more loosely attached to its host in the nominal domain.

Next, I will provide further support for my claim that verbal inflection in Korean is incorporated within the PWd. This evidence comes from the prosodic status of a verbal host, and from the manner in which vowel harmony targets the tense suffix. First of all, consider (15) (example from Miran Kim, personal communication).

- (15) emenim kkeyse cwu-si-ess-keyss-up-ni-ta
 mother(HON) NOM(HON) give-SH-PST-MOD-AH-INDIC-DECL^{29,30}
 ‘Mother might have given (it).’

We saw in section 3.1.2.2 that, in my outline of the prosodic representation of functional morphology in English, the manner in which this type of material is able to attach to its host is determined by the prosodic status of that host. In a similar vein, observe that none of **cwu-*, **cwu-si-*, **cwu-si-ess-*, **cwu-si-ess-keyss-*, **cwu-si-ess-keyss-up-* or **cwu-si-ess-keyss-up-ni-* in the verb in (15) can stand by itself; therefore, none of these forms constitutes a PWd in and of itself. But this means that none of *-si*, *-ess*, *-keyss*, *-up*, *-ni* or *-ta* can attach to its respective host via PWd adjunction or free cliticisation. Hence, each of these morphemes must be organised PWd-internally.

This analysis of verbal inflection is corroborated by alternations in vowel harmony in the tense suffix /-əss/.³¹ If the final vowel in the stem is /a/ or /o/, as in (16a) and (16b) respectively, the vowel in the suffix is realised as [a]; otherwise, there is no change in this segment (examples from Miran Kim, personal communication).

²⁹ There are two distinct honorific suffixes in this verb: *-si* and *-up*. The former elevates the subject of the sentence, and the latter elevates the addressee (Lee & Ramsey, 2000, p. 263).

³⁰ I follow Koo and Lehmann (2010) in treating the modal suffix *-keyss* as a marker of either volition or supposition, depending on the context. In (15), it is used with the latter force.

³¹ In verbs, vowel harmony only occurs in suffixes whose initial vowel is /ə/. Besides the tense suffix, this happens in the conjunction suffix /-ə/ (e.g., (14b(ii))) and in the imperative suffix /-əla/ (e.g., (12a(ii))).

- (16) (a) /bo + əss + ta/ [bwat.ta]³² see + PST + DECL
 (b) /sam + əss + ta/ [sa.mat.ta] make + PST + DECL
 (c) /mək + əss + ta/ [mə.gət.ta] eat + PST + DECL
 (d) /dʒu + əss + ta/ [dʒu.ət.ta] give + PST + DECL

If the domain of vowel harmony in the majority of languages is the PWd (Goad & White, 2004, p. 128; Nespor & Vogel, 1986), the tense suffix should lie within the same PWd as the stem.³³

My claim that verbal inflection is PWd-internal is supported by evidence that functional morphology in noun-verb compounds in Korean cannot attach via PWd adjunction. In their examination of verb-verb compounds in Mandarin, Goad and White (2006b, p. 249) argue that if this structure consisted of conjoined PWds, functional material would have to attach to the structure via PWd adjunction. Their rationale is that this material would need to have scope over the whole compound: [[[. . .]PWd [. . .]PWd]PWd func]PWd. However, the verbs in this type of compound can be interrupted by other material; therefore, they constitute independent PWds (with the consequence that verb-verb compounds in this language are phrasal rather than lexical). In turn, this means that functional morphology in Mandarin cannot be adjoined to the PWd.

The behaviour of noun-verb compounds in Korean points to the same conclusion about verbal inflection in this language. I exemplify subject-predicate compounds in (17) to (19), and object-predicate compounds in (20) to (22) (examples from Hyo Sang Lee and Jae Jung Song, personal communications, based on Lee & Ramsey, 2000, p. 109). In each pair of examples, the form on the left is the compound, and the one on the right is a variant of this structure in which a case marker intervenes between the noun and the verb.

³² The surface form of the tense suffix is [at] rather than [ass] due to manner assimilation.

³³ Importantly, the claim is not that any suffix which occurs PWd-internally will undergo vowel harmony. Rather, if the suffix *does* exhibit vowel harmony, then we can conclude that this suffix is incorporated within the PWd. This view of vowel harmony enables us to account for the fact that the declarative suffix *-ta* (which I argued was incorporated within the PWd in the discussion of (15) earlier) does not exhibit this property in (16). In other words, *-ta* is disharmonic.

- (17) (a) him-tul-ta
strength-take-DECL³⁴
'(be) difficult'
- (b) him-i tul-ta
strength-NOM take-DECL
- (18) (a) pich-na-ta
light-give.off-DECL
'shine'
- (b) pich-i na-ta
light-NOM give.off-DECL
- (19) (a) meng-tul-ta
bruise-get-DECL
'get bruised'
- (b) meng-i tul-ta
bruise-NOM get-DECL
- (20) (a) pon-pat-ta
model-receive-DECL
'imitate'
- (b) pon-ul pat-ta
model-ACC receive-DECL
- (21) (a) him-ssu-ta
strength-use-DECL
'try hard'
- (b) him-ul ssu-ta
strength-ACC use-DECL
- (22) (a) tung-ci-ta
back-become-DECL
'betray'
- (b) tung-ul ci-ta
back-ACC become-DECL

The fact that the compound can be interrupted by a case marker in each of (17b) to (22b) indicates that the noun and the verb constitute independent PWds; hence, in the verbal domain, functional morphology in Korean must attach to its host other than via PWd adjunction. This corroborates my arguments so far that verbal inflection is PWd-internal.

A quick note on syllable-contact constraints is needed before we move on. Consider (23) (examples from Miran Kim, personal communication).

³⁴ Although the glosses of (17) to (19) might convey the impression that these are object-predicate compounds, Lee and Ramsey classify them as subject-predicate compounds.

- (23) (a) /sim + kess + ta/ [sim.get.ta] plant + MOD + DECL
 (b) /nəm + si + ta/ [nəm.si.da] cross + SH + DECL

Here we have the non-homorganic coda-onset profiles [m.g] and [m.s] respectively. Observe, in particular, that each has the structure ‘nasal+obstruent’. Given that such profiles are unusual morpheme-internally on a cross-linguistic basis, these two examples might appear to undermine my claim that verbal inflection in Korean is PWd-internal. Yet this is not the case, as this type of profile occurs morpheme-internally in this language (e.g., /kamca/ [kamɕa] ‘potato’) (example from Hyo Sang Lee, personal communication).³⁵

I have argued that nominal inflection in Korean is not PWd-internal. We can now revisit the more specific question of whether this type of material is adjoined to the PWd or attaches as a free clitic. Given that verbal inflection is incorporated into the PWd, I will now exemplify several properties of nominal inflection which suggest that the free-clitic analysis is the correct one. We begin with the appositive structure shown in (24). Notice that the nominative marker *-ka* is separated from the phrasal head that it modifies (example adapted from Yoon, 2005, p. 241).³⁶

³⁵ A caveat applies, however. Although three Korean-speaking informants (including Lee) classified this word as monomorphemic, they emphasised that they were making this judgement only in the absence of any etymological knowledge to the contrary. In particular, they did not exclude the possibility that this word might have originated as a Sino-Korean N-N compound. Parallel examples from English are words like ‘apnoea’ or ‘window’. Unless a native English speaker happened to know its etymology, each would most likely be classified by the speaker as monomorphemic, whereas both are dimorphemic by origin.

³⁶ As Korean phrase-structure is right-headed, syntactic heads in noun phrases are, as a rule, adjacent to particles. This property of Korean syntax is illustrated in (i) (example adapted from Jo, 2002, p. 129).

- (i) Sunae-ka Suil-ul manna-n hakkyo-ka ywumyeng-ha-ta
 Sunae-NOM Suil-ACC meet-PST.REL school-NOM famous-do-DECL
 ‘The school where Suil met Sunae is famous.’

The situation in (24) seems to be exceptional, so I am unable to provide any additional *clearcut* examples of head-particle separability which might shore up my argument here. James Yoon (personal communication) suggests, however, that if coordinate structures are analysed as non-headed or multi-headed, then they constitute another type of structure in which the particle is not attached to the (only) head. This configuration is illustrated in (ii) (example also from Yoon).

- (ii) John-kwa Mary-ka o-ass-ta
 John-CONJ Mary-NOM come-PST-DECL
 ‘John and Mary came.’

Yoon adds that it is possible for each conjunct to be case-marked individually, but that the resulting structure will be better analysed as elliptical/reduced clausal coordination (see Yoon & W. Lee, 2005).

- (24) Chomsky ku enehakca-ka o-ass-ta
 Chomsky that linguist-NOM come-PST-DECL
 ‘Chomsky, the linguist, came.’³⁷

As we can see in (24), there are also certain nominal particles which take scope over a whole sentence. I show the quotative particle *ko* in (25a), and the apperceptive particle *kulye* in (25b) (examples adapted from Sohn, 1999, p. 213, 350).

- (25) (a) pi o-n-ta ko mal-hay-ss-ta
 rain come-PRES-DECL QUOT word-do-PST-DECL
 ‘(He) said it was raining.’
- (b) icyey ka po-p-si-ta kulye
 now go try-AH-RQ-DECL APP
 ‘How about leaving now?’

Next, let us consider some examples featuring the particle *-tul*. In (26), notice that this particle can attach promiscuously to lexical categories other than nouns—a defining trait of clitics (Zwicky, 1985, p. 287). For instance, the host can be an adverb, as in (26a), a declarative marker, as in (26b), or a conjunctive verb, as in (26c) (examples adapted from Song, 1997, pp. 209-215).³⁸

³⁷ For the sake of naturalness, I follow Yoon here in glossing *ku* as ‘the’ rather than ‘that’.

³⁸ In (26), *-tul* is being used extrinsically as a marker of distributiveness (see section 3.1.1).

- (26) (a) ai-tul-i cal-tul nol-ass-ta
 child-PL-NOM well-PL play-PST-DECL
 ‘The children played well.’
- (b) ai-tul-i hakkyo-ey k-ass-ta-tul
 child-PL-NOM school-to go-PST-DECL-PL
 ‘The children went to school.’
- (c) ai-tul-i kil-ul kennu-e-tul k-ass-ta
 child-PL-NOM road-ACC cross-CONJ-PL go-PST-DECL
 ‘The children crossed the road.’

The last relevant property is that nominal particles can be reordered with respect to each other, as illustrated in (27) (examples from Yoon, 2005, p. 257).

- (27) (a) yeki-eyse-pwuthe-ccum chwulpalhay-ss-keyss-ci?
 here-LOC-from-about depart-PST-MOD-INTER
 ‘They must have left from around here, don’t you think?’
- (b) yeki-eyse-ccum-pwuthe chwulpalhay-ss-keyss-ci?
 here-LOC-about-from depart-PST-MOD-INTER
- (c) yeki-ccum-(ey)se-pwuthe chwulpalhay-ss-keyss-ci?
 here-about-LOC-from depart-PST-MOD-INTER

Notice that the particles *eyse*, *puthe* and *ccum* can occur in three of the six logically-possible orderings of these three items.³⁹

In table 3.1, I summarise the prosodic structures identified in section 3.1.2.

³⁹ Yoon adds, however, that not all nominal particles can be reordered, plus there is some dissent among Korean speakers regarding the acceptability of certain permutations of these items. Moreover, particle reordering can sometimes change the meaning of the structure (though this does not happen in (27)).

type of morpheme		Korean (L1)	English (L2)
verbal	tense	PWd-internal incorporation	PWd-internal incorp. (irregulars); PWd adjunction (regulars)
	agreement	-	PWd adjunction
nominal	plurals	-	PWd adjunction
	particles (e.g., case markers)	free cliticisation	-

Table 3.1: Prosodic structures for noun and verb morphology in Korean and English

3.2 Review of previous research

This section reviews three studies in which inflectional asymmetries due to prosodic transfer were predicted on the basis of contrasts in stem length (i.e., short vs. long) and/or verb class (i.e., regular vs. irregular). It is structured as follows. In section 3.2.1, I outline the theory of inflectional variability that will be investigated in experiment 2. I summarise the studies themselves in section 3.2.2, and identify their chief limitations and research implications in section 3.2.3.

3.2.1 The Prosodic Transfer Hypothesis

The gist of the Prosodic Transfer Hypothesis (PTH) is that the production of L2 functional morphology is constrained by the inventory of prosodic structures in the L1 (Goad et al., 2003; Goad & White, 2004).⁴⁰ According to the original and also strong version of the PTH (Goad et al., 2003), only two patterns of behaviour are predicted to ensue in this scenario: either the morpheme in question will be deleted at a high rate, or (if this possibility is available) the learner will accommodate the L2 morpheme in non-target-like fashion within a prosodic structure available in the L1. This process of accommodation will, in turn, lead to suppliance of this morpheme at a variable rate in contexts which are predictable on phonological grounds. Moreover, these processes of deletion or accommodation are expected to persist throughout interlanguage development, so that native-like levels of inflectional production will never be attained.

The PTH is subsequently relaxed in Goad and White (2004) to allow an additional outcome specific to the later stage of interlanguage development:⁴¹ provided

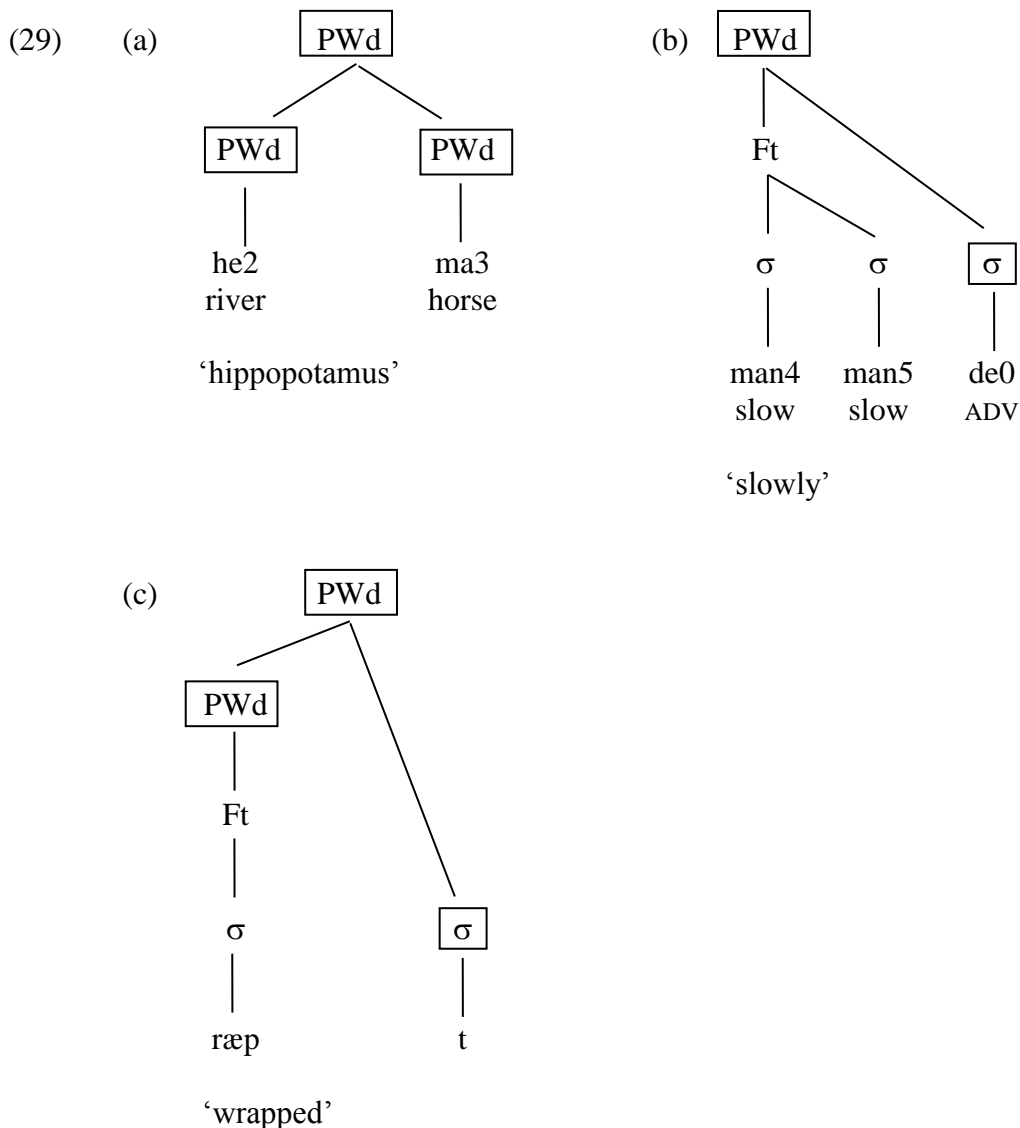
⁴⁰ For the time being, this definition will suffice. We will look more closely at how the PTH is formulated in section 3.2.3.

⁴¹ Note that Goad and White (2004) say “later”, not “late”. I will interpret “later” as “non-early”. This is not merely a pedantic point, as we shall see in section 3.2.3.

the necessary structures are present in the L1, learners will be able to build the prosodic representation needed for a particular L2 morpheme. This process of minimal adaptation, as the authors call it, is spelt out formally in (28) (statement from Goad & White, 2006b, p. 247). The required L2 structures are possible

- (28) (a) when they can be built through combining L1 licensing relations;
[or]
(b) when they involve L1 structures being licensed in new positions.

In (29), I give an example of minimal adaptation through combining L1 licensing relations; this example shows how Mandarin learners can build the PWd-adjunction structure in English. Notice that PWd dominates PWd in the lexical compound shown in (29a), while in (29b) PWd dominates σ (because there is no room in the foot for this syllable), and that the process of combining these relations yields the target structure (29c) (examples adapted from p. 251).



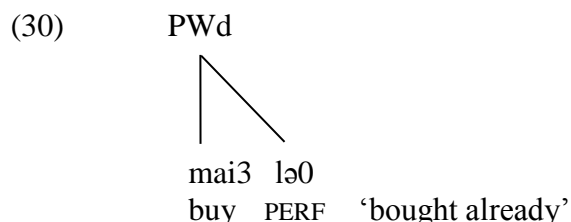
If either (29a) or (29b) is feasible, suppliance of the morpheme in question can reach a high rate.

3.2.2 Summaries of key studies⁴²

Goad, White and Steele (2003) (GW&S) tested the strong version of the PTH against the production of agreement morphology by Mandarin speakers of English.⁴³ To begin

⁴² My summaries of Goad, White and Steele (2003) and Goad and White (2006b) in this section are relatively detailed for two reasons: both studies are inherently quite complex (especially on a theoretical level), plus there are several aspects of each study which have a crucial bearing on the design of the task employed in experiment 2. Note also that, in addition to the PTH, each of Goad and White (2006b) and White (2008) tested other theories of variability in functional morphology. As far as possible, I will confine myself to summarising only those aspects of each study which are pertinent to the specific topic of this chapter.

with, let us consider the prosodic representations for inflection in both languages. Recall from section 3.1.2.2 that regular inflection attaches via PWd adjunction in English. The only inflection in Mandarin is perfective aspect, as shown in (30), and this is represented PWd-internally (example adapted from GW&S, p. 248).



Based on these cross-linguistic divergences, the PTH makes two claims regarding the production of agreement morphology by this L1 group. The first is that this material will be deleted across the board by some of the speakers in their study. These speakers recognise that regular inflection (including agreement) in English cannot be organised PWd-internally, and that a unified analysis of this type of inflection is called for; however, the PWd-adjunction structure is absent from Mandarin.

The second prediction is that other speakers will produce regular inflection where this material can be incorporated into the PWd.⁴⁴ In the case of a verb such as 'fill', for example, incorporation is possible because the inflected form contains a three-place rhyme (i.e., [fɪlɪz]), plus rhymes of this length are permitted in English.⁴⁵ If the inflection is incorporated into the PWd, the inflected form 'fills' will have the prosodic structure [fɪl-z]_{PWd} instead of the target structure [[fɪl]_{PWd} z]_{PWd}. Incorporation is also possible if the agreement inflection is attached to a sibilant-final stem; in this case, schwa epenthesis enables the inflection to be syllabified as a coda in a two-position rhyme (e.g., 'races' [reɪ.səz]_{PWd}). High rates of inflectional suppliance can therefore be anticipated for verbs of either of these types.⁴⁶

⁴³ GW&S also examined tense morphology; however, because the data was elicited via a story-telling task, they were unable to obtain a representative amount of data for this type of inflection. For this reason, I will limit my summary of GW&S to the results for agreement.

⁴⁴ The following account of the rationale behind GW&S's second prediction differs somewhat from the one found in the source itself. This is because GW&S couch their own rationale within Government Phonology (e.g., Kaye, Lowenstamm & Vergnaud, 1990), while I relate this prediction to the issue of rhyme length instead (see section 3.1.2.2). This difference in perspective does not have a critical bearing on our interpretation of GW&S's second prediction.

⁴⁵ With few exceptions, this rhyme length seems to be the upper limit that languages tolerate.

⁴⁶ Note that the two types of Mandarin speaker of English just identified have difficulty *only* with inflection. They have 'overcome' any L1-based *articulatory* difficulties responsible for the reduction of word-final consonant-clusters per se, regardless of whether these clusters occur in monomorphemic

However, the situation is more complicated for a long-stemmed inflected verb like ‘builds’ [bɪldz]. Recall that, in English, a rhyme cannot contain more than three positions. In response to this restriction, one of two scenarios can arise. First, if this inflected form occurs before a consonant-initial word or a pause, the rhyme will contain four positions (i.e., [bɪldz]). But recall from section 3.1.2.2 that monomorphemic words with four-place rhymes are infrequent in English (e.g., [tʃaɪld] ‘child’). Consequently, high rates of inflectional deletion are predicted for forms with this rhyme length when they occur in either of these phonological environments. The other scenario is that if ‘builds’ occurs before a vowel-initial word, as in ‘builds on’ [bɪldzən]_{PWd}, the suffix [z] will be able to act as the onset of the following syllable, and so can be incorporated into the following PWd rather than into the verb stem itself (e.g., [bɪld]_{PWd} [zən]_{PWd}).⁴⁷ Thus, inflectional suppliance for a form such as [bɪldz]_{PWd} before a vowel-initial word should be high.

The subjects of GW&S’s study were 12 Mandarin learners of English who had all scored at high-intermediate/low-advanced level on part of the placement test used by the English language school where they were studying. Sets of pictures were utilised to elicit production of the two desired kinds of inflectional morphology, each depicting a sequence of events. In accordance with their predictions, the subjects exhibited two divergent patterns of suppliance: some of these L2ers (i.e., the ATB subgroup (N=6)) produced inflection in hardly any of the contexts in which this material was required (10%), while the others (i.e., the incorporation subgroup (N=6)) supplied this material in about half of these contexts (49%).⁴⁸

Table 3.2 presents a more detailed picture of how the production of agreement inflection varied according to its phonological context for each group (table adapted from GW&S, p. 258).

words such as ‘weld’ or in pseudo-inflected irregular verbs such as ‘kept’, and can therefore produce such clusters reasonably accurately. (Importantly also, this is an assumption which underlies the PTH on a general level, not one of the formal predictions of this hypothesis.) One should bear in mind that the PTH is intended to account for the behaviour of this sort of learner rather than one who has problems with right-edge material on words generally. In this regard, the subjects in GW&S should not be confused with the type of Mandarin speaker of English epitomised in the literature on morphological variability by Lardiere’s (2007) case-study subject Patty.

⁴⁷ This process of resyllabifying inflection as an onset (thereby incorporating it into the following PWd) is also possible after short-stemmed inflection (e.g., ‘fills in’ [fɪl]_{PWd} [zɪn]_{PWd}). In general, resyllabification of inflection in this manner should not be viewed as a strategy that learners employ to preserve inflectional material from deletion; rather, this process simply happens in relatively fast speech, regardless of the length of the rhyme. Hence, some factors which might impact on the frequency with which inflection is resyllabified in this way include task type, learner proficiency and spoken fluency.

⁴⁸ GW&S do not explain how these figures of 10% and 49% were derived. I assume that, for each figure, all instances of suppliance were collapsed together across all of the contexts shown in table 3.2 below.

syllabification of agreement morpheme	inflected form	suppliance (%)	
		ATB subgroup	incorp. subgroup
(a) incorporation into following PWD	[bɪld]ₚᵂᵈ [zɑn]ₚᵂᵈ ‘builds on’	7	75
(b) coda in two-position rhyme	[reɪ.səz]ₚᵂᵈ ‘races’	0	27
(c) coda in three-position rhyme	[fɪlz]ₚᵂᵈ ‘fills’	7	68
(d) coda in four-position rhyme (illicit)	[bɪldz]ₚᵂᵈ ‘builds’	0	9

Table 3.2: Suppliance (%) of agreement inflection in various contexts (GW&S)

Observe that whereas stem length⁴⁹ had no significant impact on the pattern of suppliance for the ATB subgroup, which was uniformly low, it played a major role in determining the behaviour displayed by the incorporation subgroup. In particular, suppliance of this inflection was much lower when there was no possibility of PWD-internal incorporation of agreement morphology either into the stem itself or into the following syllable.

GW&S’s conclusions are supported by evidence from word-final cluster-reduction in monomorphemic parallels. For the ATB subgroup, compare the low suppliance of inflection in forms with three-place rhymes, such as [fɪlz] ‘fills’ (7%; see (c) in table 3.2), with the much higher suppliance of word-final consonant-clusters in parallels like [bɪld] ‘build’ (57%). Note also that this type of cluster can only be organised PWD-internally. This divergence between inflected forms and monomorphemic parallels suggests that any difficulties experienced by the ATB learners with inflectional morphology must have had a prosodic rather than merely articulatory basis. By contrast, the subjects in the incorporation subgroup performed equally well on inflection in words like ‘fills’ (68%; see (c) in table 3.2) and on word-final consonant-clusters in monomorphemic parallels (68%). Another crucial detail is that the suppliance of word-final consonant-clusters in monomorphemic parallels by both groups of learners was similar (57% vs. 68%). This is further evidence that the difference in inflectional suppliance between these two groups cannot have been due to L1-based difficulties with pronouncing coda clusters.

The second study, Goad and White (2006b) (G&W), tested the relaxed version of the PTH against the production of tense and perfective inflection by Mandarin learners. Given the differences between Mandarin and English in prosodic terms, the

⁴⁹ The findings in table 3.2 suggest that this term should really be ‘stem-final rhyme length’; however, I am bowing to convention here and using the more familiar term.

PTH predicts the following asymmetries for the early phase of L2 development.⁵⁰ First, suppliance of irregular inflection is expected to be high since PWd-internal incorporation is possible in Mandarin. In addition, because Mandarin lacks the PWd-adjunction structure necessary for organising regular inflection in target-like form, it will be possible to distinguish between two subgroups of speakers: the ATB and incorporation subgroups that we encountered in GW&S.

However, there are also some key differences between these two studies. One is that G&W do not mention the possibility that inflection will be resyllabified as an onset (e.g., ‘builds on’ [bɪldzən]) (the reason for this will become clear when I describe the methodology used in this study shortly). G&W also suggest that, besides deleting regular inflection on long-stemmed forms, the incorporation subgroup may organise inflection on these forms within the PWd via a process of rhyme-shortening (e.g., [[hɛlp]_{PWd} t]_{PWd} → [hɛp-t]_{PWd}) instead. But the most significant difference between the two studies concerns their respective predictions for the later phase of development. In keeping with the relaxed PTH, G&W predict that the suppliance of both short- and long-stemmed regular inflection by Mandarin learners will increase as members of both of the subgroups identified above begin to use minimal adaptation to cobble together the PWd-adjunction structure from licensing relations available in the L1.⁵¹

This set of predictions was tested using a combined sentence-completion and spoken-production task.⁵² In all, 10 Mandarin learners of English at intermediate proficiency and nine native-speaking controls participated in the study.⁵³ The subjects were shown a sentence beginning which created a present, past or perfective context, plus two options for the remainder of the sentence;⁵⁴ however, only one of these options meshed naturally with the lead-in information provided. In the sentence-completion phase, the subjects had to choose between uninflected present and past, or between uninflected present and perfective.⁵⁵ I give examples of these sentences in (31) (adapted from G&W, p. 253).

⁵⁰ Presumably, although they are still early learners, they have progressed far enough in their interlanguage development to have overcome their L1-derived ban on final consonant-clusters per se.

⁵¹ The incorporation subgroup presumably have to ‘unpack’ the PWd-internal representation for short-stemmed regulars before they can build the PWd-adjunction representation.

⁵² The sentence-completion phase was included in order to test Hawkins & Liszka’s (2003) hypothesis that tense omission is due to a syntactic deficit.

⁵³ G&W do not provide details of how the proficiency of these learners was measured.

⁵⁴ Note that each of these sentence endings was grammatical in its own right.

⁵⁵ Because no suitable stimuli juxtaposing past with perfective forms could be devised, a direct comparison of the suppliance rates for these two types of inflection was not feasible.

- (31) (a) uninflected present vs. past:
Last night after dinner ...
 • *you show me photos of your daughter.*
 • *you showed me photos of your daughter.*
- (b) uninflected present vs. perfective:
My parents can visit me today because ...
 • *I have cleaned my apartment.*
 • *I clean my apartment.*

The subjects were allotted 12 seconds in which to select and then memorise the sentence ending they deemed appropriate, before indicating their response with a button push. Then, in the spoken-production phase, they were shown a blank screen and asked to say their chosen sentence ending out loud.

At this point, I want to examine one feature of the task used by G&W which has important implications for experiment 2. According to Heather Goad (personal communication), each stimulus verb in the production task was located in a phonological environment which blocked resyllabification of inflectional [t] or [d] as the onset of the following syllable even on short-stemmed items (cf. GW&S). We can see this in (31), for instance, where each of the stimulus verbs ‘show(ed)’ and ‘clean(ed)’ occurs immediately before [m]. The rationale for blocking resyllabification in this manner is that it eliminates one way in which the L2er can avoid having to produce inflection in target-like fashion. In turn, this helps to reveal the full extent of the learner’s prosodic difficulties with producing inflection in target-like fashion.⁵⁶

Various types of stimulus item were included in the study. As shown in table 3.3, the stimulus verbs fell into several categories (table adapted from G&W, p. 253).⁵⁷

⁵⁶ The learner can also circumvent the required structure via schwa epenthesis; however, in contrast to resyllabification of inflection, this strategy cannot be reliably prevented.

⁵⁷ No sibilant-final stems were used as stimuli (cf. GW&S).

	Regular		irregular	
	long stem (...VXC#)	short stem (...VC#)	pseudo-inflected	ablaut
uninflected	‘help’ [hɛlp] _{PWd}	‘wrap’ [ræp] _{PWd}	‘keep’ [kip] _{PWd}	‘win’ [wɪn] _{PWd}
tense/ perfective	‘helped’ [[hɛlp] _{PWd} t] _{PWd}	‘wrapped’ [[ræp] _{PWd} t] _{PWd}	‘kept’ [kɛp-t] _{PWd}	‘won’ [wʌn] _{PWd}

Table 3.3: Types of stimulus verb (G&W)

Two other kinds of item were also included (Heather Goad, personal communication). First, monomorphemic forms were used as parallels for most of the inflected forms of the stimuli (e.g., ‘scanned’ cf. ‘send’). As in G&W, the point of including these forms was to exclude the possibility that inflectional omission was due to articulatory difficulties.⁵⁸ In addition, the uninflected counterparts of the inflected forms were included as ‘controls’ (I will provide a specific example of how these forms were used shortly).

G&W’s findings are displayed in table 3.4 (adapted from G&W, p. 255).

verb type		suppliance (%)	omission (%)	other
past	short-stemmed regulars (n=102)	87	11	2
	long-stemmed regulars (n=41)	92	7	
	pseudo-inflected irregulars (n=60)	93	7	
	ablaut (n=49)	94	6	
perfective	short-stemmed regulars (n=42)	91	7	2
	long-stemmed regulars (n=34)	97	3	
	pseudo-inflected regulars (n=39)	94	3	3

Table 3.4: Suppliance (%) of past/perfective inflection (G&W)

The table reveals that, as predicted under the PTH, suppliance of irregular inflection was high (because this inflection was being incorporated within the PWd). Regular inflection was also supplied at a high rate irrespective of stem length, leading G&W to tentatively conclude that none of the expected asymmetries was present. Recall that the PWd-adjunction structure necessary for representing regular inflection in target-like fashion is unavailable in the L1; however, it *is* possible for this structure to be minimally adapted from existing L1 representations. In this light, the high rate of suppliance for regular inflection in G&W’s study could be interpreted in two ways,

⁵⁸ Comparison of data from the inflected forms and the parallels confirmed that the participants in this study were dropping inflection for prosodic reasons.

either of which would be consistent with the behaviour anticipated for this L1 group: (i) the learners were prosodifying this type of inflection on both short and long stems PWD-internally via shortening of long-stemmed regulars;⁵⁹ or (ii) these speakers had acquired the target PWD-adjunction structure for regular verbs in general via minimal adaptation.⁶⁰

G&W argue in favour of (ii) by examining the incidence of onset-nuclear (ON) sharing (Goad, 2002; Goad & Brannen, 2003) on stem-final stops.^{61,62} ON sharing is a strategy which enables a stop in this position to be syllabified in non-target fashion as an onset whose melodic content has spread into the following nucleus; in turn, this segment circumvents the L1-derived ban on stops as codas.⁶³ In phonetic terms, ON sharing is signalled by fortis release, a mode of production involving a stronger burst of air and longer duration than plain (i.e., target-like) release. As table 3.5 shows, despite the parallelism between short(ened)-stemmed regulars and pseudo-inflected irregulars in segmental terms (i.e., short vowel + stop + inflection), these two verb-classes exhibited different rates of fortis release on stem-final stops: whereas short(ened)-stemmed regulars allowed these segments to be released either as plain or fortis, stem-final stops in pseudo-inflected irregulars were mostly released as plain (table adapted from G&W, p. 260).

	target-like (plain) release	fortis release	epenthesis (after stem-final C)	deletion
long stems (n=24)	21	54	25	
short(ened) stems (n=86)	58	34	3	5
pseudo-inflected stems (n=33)	73	9	3	9

Table 3.5: Production of stem-final stops in past/perfective contexts (G&W)

⁵⁹ These inflected forms were shortened in 62% of cases.

⁶⁰ As G&W point out, if (ii) were the correct interpretation then shortening of long-stemmed regulars could not be attributable to the absence of PWD adjunction in the L1, but would instead reflect L1-derived constraints on syllable structure.

⁶¹ Let us pause to compare the respective ways in which GW&S and G&W determined the types of prosodic representation that the Mandarin learners in their studies were using. GW&S were able to make this determination on the basis of asymmetries in the rates of agreement omission; in G&W, there were no asymmetries in inflectional suppliance, so these authors resorted to analysing the phonetic properties of the stem-final consonant.

⁶² Fortis was also the usual method of release for the inflectional morpheme in this study, plus it was observed much more often in irregulars than in regulars. G&W suggest that this asymmetry points to a difference in the prosodic organisation of regular inflection and pseudo-inflection. Even so, the precise nature of the difference cannot be determined on this basis alone. The release on the stem-final consonant is more informative in this regard.

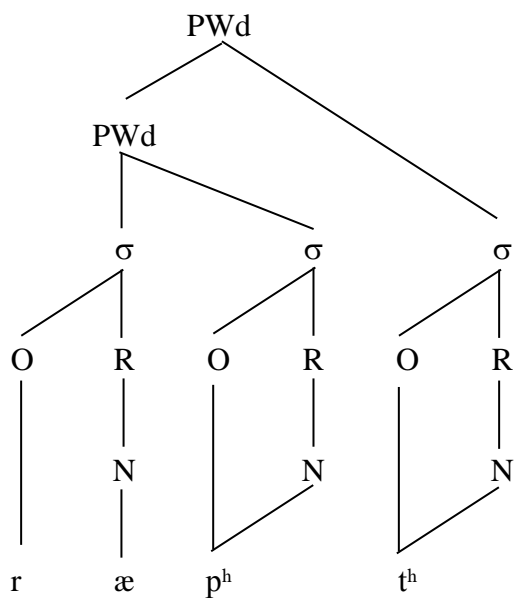
⁶³ Vowel epenthesis achieves the same end, though G&W suggest that it is characteristic of an earlier stage of interlanguage development; besides, epenthesis was not employed frequently by the participants (see table 3.5 below).

In an extension of the Empty Category Principle (ECP) (e.g., Kaye, 1990), G&W suggest that adjacent instances of ON sharing cannot occur within the same PWd, as the nuclei in these syllables are defective (insofar as they do not have any melodic content). Since this pattern was frequently observed in short(ened)-stemmed regulars on the stem-final stop plus inflectional [t], as in (32a(i)), inflection in regular verbs must have been organised *outside* the PWd through adjunction. Pseudo-inflected irregulars, on the other hand, were not produced with adjacent ON-sharing syllables to any great extent, as in (32b(i)); hence, a PWd-internal analysis of inflection in these forms is appropriate, as in (32b(ii)) (examples from G&W, p. 262).⁶⁴

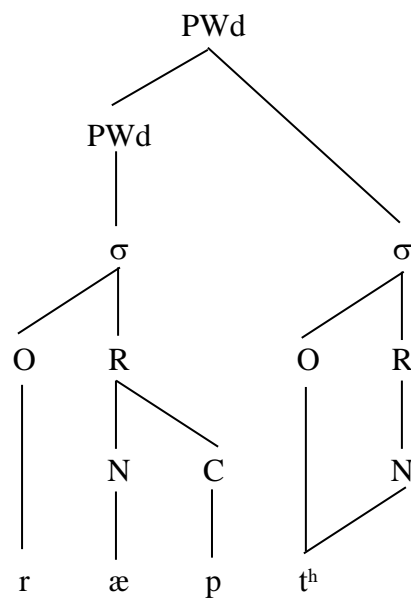
⁶⁴ I am now in a position to illustrate the value of including uninflected forms as controls in this type of experiment. For example, suppose the inflected form ‘wrapped’ were pronounced [ræp^ht^h]. If the uninflected form ‘wrap’ were pronounced [ræp^h] (instead of [ræp]), then we could conclude that the fortis release on the stem-final consonant in [ræp^ht^h] was not a reliable clue to the type of prosodic structure that was being used for the inflection in this form, but was just a feature of the speaker’s pronunciation of [p] in general. (As G&W do not comment on the results for the uninflected forms in their study, I assume that they were able to use these forms to exclude the type of possibility just exemplified.)

(32) (a) short(ened) stems

(i) expected (attested 34%)

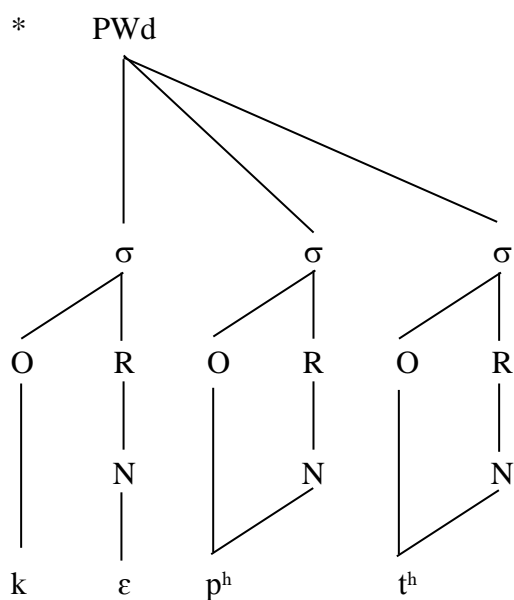


(ii) expected (attested 58%)

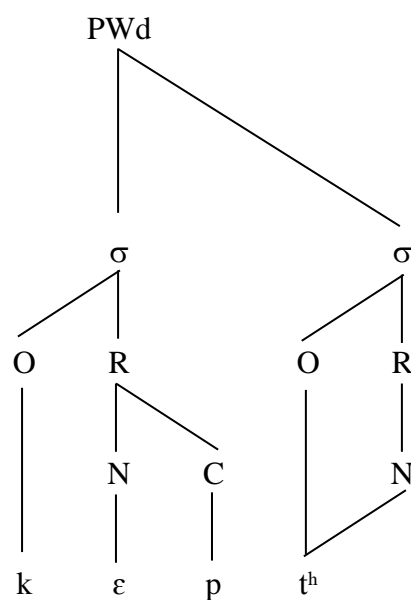


(b) pseudo-inflected stems

(i) unexpected (attested 9%)



(ii) expected (attested 73%)



White (2008) focuses on the production of regular vs. irregular tense inflection by Mandarin and French learners of English.⁶⁵ The differences between Mandarin and English inflection on a prosodic level have already been covered in this section; in French, tense inflection is organised PWD-internally, while the PWD-adjunction structure is used for other constructions in this language.⁶⁶ Given these cross-linguistic mismatches, the PTH makes the following predictions in this situation: (i) irregular inflection will be supplied at a high rate by both L1 groups, since PWD-internal incorporation is used for this type of inflection in the L2; and (ii) suppliance of regular inflection will be low for both groups of speakers. However, White also allowed for the possibility that regular inflection could be represented using alternative strategies. Specifically, the French group may utilise the PWD-adjunction structure available at the left edge for prefixes in this language via minimal adaptation (in keeping with the relaxed PTH), while regular inflection can be incorporated into the PWD in the L2 by Mandarin speakers in some situations.⁶⁷

This set of claims was tested with an elicited-production task.⁶⁸ Three groups of participants were involved: 23 Mandarin speakers, 19 French speakers and 19 native-speaking controls. Each of the L2 groups was placed at high-intermediate/low-advanced level. In the task, the participants had to describe two sets of pictures, each of which showed a sequence of events. One set was designed to elicit tense morphology and the other agreement morphology, while plurals were targeted in both sets.

The results for tense are shown in table 3.6 (adapted from White, 2008, p. 315).

⁶⁵ The study also covers other forms of functional morphology (e.g., articles) which lie outside the scope of the present chapter. In addition, White examines agreement and plurals, which *are* relevant to experiment 2; however, she does not distinguish explicitly between short- and long-stemmed regulars in her study. For this reason, I will exclude White's results for agreement and plurals from this summary.

⁶⁶ White's evidence that tense inflection is represented in this manner comes from word stress, as inflection falls within the domain of stress assignment in this language. PWD adjunction is used in French for certain prefixes (cf. Hannahs, 1995). In a similar vein, Cardoso (2003, pp. 122-124) argues that the adjunction structure is used for certain prefixes in closely-related Picard.

⁶⁷ White appears to overlook the possibility that the French group should also be able to incorporate regular inflection into the PWD in the same circumstances (since tense inflection is PWD-internal in the L1).

⁶⁸ A separate written grammaticality-judgement task was also employed. As this task did not focus on spoken production, we will not consider it in the present chapter.

group	suppliance (%)	
	regular tense	irregular tense
controls	54/54 (100%)	88/88 (100%)
French speakers	24/48 (50%)	106/127 (83.5%)
Mandarin speakers	24/50 (48%)	120/144 (83.33%)

Table 3.6: Suppliance (%) of tense inflection (White, 2008)

These results confirmed the prediction of the PTH that irregular inflection would be supplied at a high rate by each L1 group, while suppliance of regular inflection would be low.

3.2.3 Limitations of previous research

In the previous section, I summarised three studies concerned with testing the PTH. The participants in each study had been placed roughly at intermediate proficiency at the outset. In each of GW&S and G&W, two predictions regarding the suppliance of regular inflection were investigated. The first was that, for some learners, this material will be supplied at a low rate for both short- and long-stemmed regulars. This is because these learners recognise that PWD-internal incorporation cannot be used for regular inflection, yet cannot produce the target structure. The second prediction of both studies was that, for other learners, suppliance rates will be high for short-stemmed inflection because this material is being incorporated into the PWD, but low for long-stemmed inflection because incorporation is not possible in this case. Under the relaxed version of the PTH, however, these predictions are specific to the early phase of interlanguage development. G&W claimed that, later on in this process, regular inflection will be supplied more frequently as the learners start to minimally adapt the PWD-adjunction structure from licensing relations already available in the L1. White (2008) predicted that regular inflection will be supplied at a low rate because tense inflection is organised PWD-internally in French, plus the only form of inflection available in Mandarin (i.e., aspect) is incorporated within the PWD. Finally, it was predicted in GW&S, G&W and also White (2008) that suppliance of irregular inflection will be high regardless of the developmental stage attained, because PWD-internal incorporation is available in the L1 in each study.

The results for irregular inflection were as expected in the three studies, as were White's results for regular inflection; however, the findings for this type of inflection in GW&S and G&W were problematic. GW&S's results were in keeping

with the strong PTH, since it is assumed under this version of the hypothesis that the effects of prosodic transfer will persist throughout interlanguage development. By contrast, provided we deem intermediate-level participants to be non-early rather than early L2ers, G&W's results for regular inflection were consistent with the relaxed PTH instead.

Admittedly, this discrepancy is mitigated by the fact that relatively few learners took part in each study. In GW&S, the two subgroups that these authors distinguish from each other consisted of only six L2ers each. Nor does the group of ten L2ers used in G&W seem large enough to motivate any robust generalisations, though this is perhaps a moot point.

Even so, an explanation for the divergence between these sets of results is called for. One detail worth noting is that the studies focused on different morphemes: GW&S examined agreement inflection, and G&W tense and perfective inflection. Recall that the only form of inflection in the L1 in this study is aspect. Although an explanation along these lines is out of keeping with the PTH (i.e., the theory of variability that we are investigating in the present experiment), we might conjecture that the suppliance of perfective inflection (i.e., a type of aspect marker) in the L2 was facilitated by syntactic transfer in this case. But then we have to explain why the suppliance of *tense* inflection was also high for these learners.

A more satisfactory explanation is put forward by G&W themselves, who tentatively attribute the high rates of suppliance of both morphemes in their study “in part” to a task effect (p. 255). Specifically, juxtaposing pairs of different inflected forms may have sensitised the participants in G&W to the presence of the inflectional material on the stimuli. In turn, this sensitisation could have boosted the suppliance rates for tense and perfective inflection for all three main classes of verb involved, thus obscuring any asymmetries in suppliance rates among classes that might otherwise have manifested themselves.⁶⁹

In experiment 2, I examine the implications of each of the issues identified above. I also extend previous research on the PTH in general by examining how freely a given prosodic structure in the L1 can be redeployed in the L2. It would be reasonable to say that, to date, this aspect of the PTH has not been formulated in a definitive way. Goad and White (2004, p. 137) interpret this hypothesis in relatively loose terms such

⁶⁹ Note, however, that G&W are not suggesting that this sensitisation effect actually *induced* these learners to use PWD adjunction for regular inflection in preference to PWD-internal incorporation.

that the learner will experience difficulty producing a given construction in the L2 unless the target representation is “available [for some particular construction somewhere] in the L1”.⁷⁰ In effect, this means that it is possible for a given prosodic representation in the L1 to be decoupled from the syntactic construction that it is associated with. However, Goad and White (2006a, pp. 213-214) permit (but, it must be conceded, do not *enforce*) a more restricted view of transfer such that difficulties in the production of functional morphology will arise when the target representation is “unavailable [for some particular construction somewhere] in the L1 (*or unavailable for the particular construction [in the L1 that it is associated with]*)” (my emphasis).⁷¹ On account of this uncertainty, we are unable to make confident predictions about where exactly in the L2 the effects of prosodic transfer, including asymmetries driven by contrasts in stem length and verb class, might reveal themselves.

The present study aims to clarify this situation by focusing on TAP inflection.⁷² Consider table 3.1 again (repeated below as table 3.7).

type of morpheme		Korean (L1)	English (L2)
verbal	tense	PWd-internal incorporation	PWd-internal incorp. (irregulars); PWd adjunction (regulars)
	agreement	-	PWd adjunction
nominal	plurals	-	PWd adjunction
	particles (e.g., case markers)	free cliticisation	-

Table 3.7: Prosodic structures for noun and verb morphology in Korean and English

Notice that there are several mismatches between Korean and English in syntactic and prosodic terms for these three types of functional morpheme.

3.3 Predictions

As necessary background to the predictions of the PTH in this section, I want to make three interlinked assumptions concerning the redeployment of a given prosodic structure

⁷⁰ This is essentially the same interpretation of the PTH as the one adopted in both GW&S and G&W, despite the fact that the former study assumes the strong version of the PTH and the latter the relaxed one.

⁷¹ This parenthetical restriction of the PTH implies, of course, that if the L2 construction is the same as the one in the L1, it will be easier than otherwise for the L1 prosodic structure to be used for the L2 construction.

⁷² Only regular plural-morphology is covered here. I have decided against covering irregular plural-morphology as well on the grounds that there are only a handful of these forms in English.

from the L1 in the L2 in general. I take the view that these assumptions underlie this hypothesis. They are listed in (33).

- (33) (a) If more than one L1 prosodic structure is available, the learner will redeploy the L1 structure which is used for the same construction as the one in the L2.
- (b) If this particular L1 structure is not available, another L1 structure within the same domain (nominal or verbal) will be selected.
- (c) If no other L1 structure is available in this domain, an L1 structure from a different domain will be used.

The rationale behind this set of assumptions is that the task of redeploying a prosodic structure in the L2 is cognitively demanding. More particularly, these demands will be lowest in (33a) and highest in (33c).

Based on the cross-linguistic scenario depicted in table 3.7, we can formulate several predictions for the omission of TAP morphology by Korean learners of English (KLEs).⁷³ Let us consider tense inflection first of all. In accordance with (33a), I assume that KLEs will use PWD-internal incorporation rather than free cliticisation to organise this material. The predictions of the current experiment for this learner group will be the same as G&W's for Mandarin learners; specifically, early in development, two patterns of inflectional suppliance will be observed. In one of these, short-stemmed inflection will be incorporated within the PWD and therefore omitted at a low rate; however, this will not be possible with long stems. In the other pattern, regular inflection will be omitted at a high rate for both short and long stems. This is because the learners adopt a unified analysis whereby they recognise that PWD-internal incorporation is not the target representation for regular inflection, yet cannot produce the structure that is needed. The PTH also claims that omission of irregular inflection will be low since this material can be incorporated PWD-internally.⁷⁴ Later in development, the KLEs will omit regular TAP inflection at a low rate regardless of stem length because they are able to build the necessary PWD-adjunction structure via minimal adaptation (see (28)). As before, omission of irregular inflection is expected to be low in this situation.

⁷³ For the rest of this chapter, I will refer to omission rather than suppliance of inflection. This is in order to maintain consistency with the approach taken in experiment 1.

⁷⁴ From now on, I will be using the term 'irregular inflection' to mean only 'pseudo-inflection', unless otherwise indicated.

We will now turn to agreement and plural inflection. Although Korean lacks marking for both of these properties, the predictions associated with the two morphemes are slightly different. Agreement is in the same domain as tense; therefore, assumption (33b) will be relevant here. This means that we can expect to see the same asymmetries in the omission of agreement morphology as the ones already predicted for regular tense morphology. Concerning plurals, Korean uses the free-clitic structure for particles in the same domain; hence, in keeping with assumption (33b), this prosodic representation will be used for plurals. However, no asymmetries in the omission of this type of inflection are anticipated (since stem length has no bearing on how easily a free clitic attaches to its host).⁷⁵ It follows that regular inflection in general will be omitted at a low rate. Moreover, since KLEs can use the free-clitic structure directly (without needing to minimally adapt it from another representation), we can expect that the proficiency of the learner will have less impact on omission rates than if minimally adaptation were involved.

So far in this section, I have assumed that KLEs will organise irregular inflection PWD-internally. Another possible outcome is that these learners will use PWD adjunction not only for regular inflection (i.e., the target representation), but for irregular inflection as well. Notice the near-isomorphy between the prosodification of regular inflection in a case like ‘fill’ → ‘filled’ (i.e., [fil]_{PWd} → [[fil]_{PWd} d]_{PWd}) and that of irregular inflection in a case like ‘feel’ → ‘felt’ (i.e., [fi:l]_{PWd} → [[fɛl]_{PWd} t]_{PWd}),⁷⁶ if inflection is adjoined to the PWD rather than incorporated within the PWD in the latter case. If PWD adjunction is used for both regular and irregular inflection, omission of this material is predicted to be high for each class of verb, since this structure has to be built via minimal adaptation.

Let me suggest two reasons why this overgeneralisation of PWD adjunction from regulars to irregulars may plausibly occur. To start with, before KLEs are able to recognise that irregular inflection needs to be organised PWD-internally, they have to notice two properties of this type of inflection. The first is that the vowel in the bare

⁷⁵ Notice that, unavoidably, I am predicting a similarity rather than a difference in inflectional omission in two contexts here, so that this particular prediction strays outside the specific remit of the current thesis.

⁷⁶ In section 3.1.2.2, I pointed out that a form like *[kep] (in ‘kept’) cannot stand on its own, and therefore does not itself form a PWD. Note, however, that I was talking about the *native* grammar there. In the present context, we are dealing instead with the *L2* grammar; hence, I assume that this restriction on a form like [[fɛl]_{PWd} (in ‘felt’) does not apply. That is, the learner is able to entertain the notion of using PWD adjunction to organise the inflection in ‘felt’ because she does not recognise that *[fɛl] cannot stand by itself. (Incidentally, I am not claiming here that the reason why the learner can treat [fɛl] in ‘felt’ as a PWD is because she cannot distinguish between this [fɛl] and the homophone ‘fell’.)

form of a verb like ‘feel’ undergoes shortening (rather than just ablaut) when the verb is inflected to ‘felt’. But recognising that the vowel needs to be shortened might be difficult for these learners because the vowel-length distinction is not robust (if it exists at all) in standard Korean. This problem is exacerbated by the fact that English speakers do not produce long vowels (e.g., [i:]) with much more duration than short vowels (e.g., [ɪ]) anyway, since the long-short contrast in this language is more robustly cued by quality (i.e., tense-lax) differences. The second property of irregular inflection that KLEs must notice before they can produce it accurately is that the vowel pairings they observe in the bare and inflected forms of this type of verb (e.g. [i:]-[ɛ] in ‘feel’ and ‘felt’) are phonologically-related.

Indeed, KLEs might be inclined to overgeneralise PwD adjunction to irregulars not only because incorporating irregular inflection into the PwD is difficult (for the reasons given above), but also because using PwD adjunction for this type of inflection is inherently advantageous. This is because it yields an analysis of tense inflection in general which is more parsimonious, and therefore less ‘costly’ on a cognitive level, than one in which these two classes of verb need to be inflected using distinct prosodic structures.⁷⁷

3.4 Methodology

As in experiment 1, 14 intermediate KLEs, 14 advanced KLEs, and 14 NSs took part. The materials and procedure for experiment 2 were largely the same as in experiment 1 (see section 2.2). In this section, I will focus on aspects of the methodology that were specific to the present experiment. In figure 3.2, I show a taxonomy of the main varieties of inflection that were covered (a full list of stimuli will be provided shortly).

⁷⁷ By the same token, this form of overgeneralisation has its drawbacks as well. First, in the case of a irregular verb like ‘feel’ or ‘send’, the inflection is [t] rather than [d] (cf. regulars like ‘peel’ and ‘mend’ respectively). A second, more serious problem is that the stem of a verb like ‘send’ has to be modified in such a way that it is actually able to host the inflection (i.e., [send]_{PwD} → [[sɛn]_{PwD} t]_{PwD}). (Re the status of [sɛn] as a PwD, see fn. 76.)

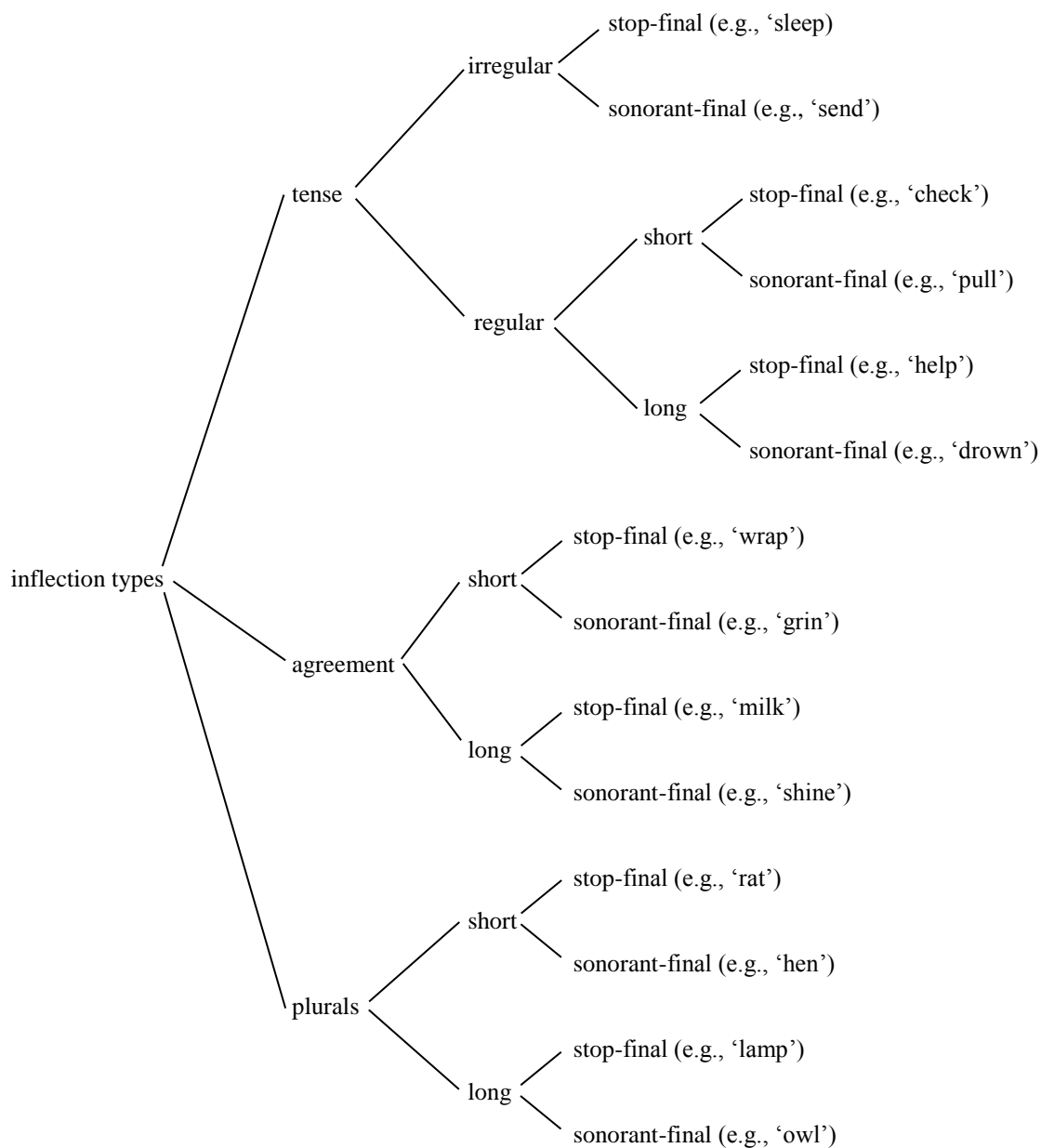


Figure 3.2: Taxonomy of inflection types for stimuli used in experiment 2

A little more information about these varieties is provided below.

- (i) A subset of stems in each verb class ended in stops (e.g., ‘check’). In G&W’s study, we saw how the incidence of fortis release on stem-final stops indicated that the Mandarin learners in this study were using PwD adjunction for regular inflection. Given that Korean permits stops to occur syllable-finally plus these segments are unreleased, there might not appear to be compelling grounds for

expecting the KLEs in the present experiment to produce these segments with fortis release. However, this possibility cannot be discounted.

- (ii) A subset of stems in each verb class ended in sonorants. In general, the omission of tense inflection on stems ending in stops cannot be confidently attributed to prosodic factors; rather, it may be due to one or both of two purely articulatory problems instead. First, there is the general tendency for learners to reduce final consonant-clusters if the L1 lacks them (see fn. 46). In addition, I take the view that when a final consonant-cluster contains two stops in a row, any difficulty with the pronunciation of these clusters will be aggravated by an additional problem which affects *stop-stop* clusters specifically. Note also that this latter problem is not L1-related; rather, it arises because a change in place of articulation is required at the same time that the active articulator (i.e., the lower lip, or the tongue tip, blade or body) is making contact with the passive articulator. The inclusion of the sonorant-final stems along with the stop-final ones in the stimulus pool was intended to help eliminate the possibility that the omission of tense inflection was at least partly due to this stop-stop articulatory difficulty.⁷⁸
- (iii) Only pseudo-inflected forms were included in the irregular class. The point of this restriction was to optimise parallelism between the regulars and irregulars in the experiment in terms of the location of the inflectional morpheme at the right edge (cf. ablaut-type irregulars). This was particularly important for allowing the rates of fortis release on stem-final stops to be compared across verb types (see (i) above).
- (iv) Within the long-stemmed regulars, the stop-final stems ended in clusters containing either [m] (e.g., ‘dump’) or [l] (e.g., ‘sulk’). In a stem such as ‘blink’, for example, it is possible for the rhyme to be shortened via nasal deletion plus compensatory vowel-nasalisation, yielding the form [bɫɪk]. Since Korean permits [l] and [m] as syllable codas, stop-final stems containing these segments were expected to resist rhyme-shortening in the present study. Even so, some provision still needs to be made for this possibility.
- (v) The nucleus of each long sonorant-final stem was either [ai] (e.g., ‘smile’) or [au] (e.g., ‘drown’). As there are very few long sonorant-final stems which end

⁷⁸ Although nasals were included among the sonorant-final stems and they are also stops, none of the nasal-consonant clusters involved a change of place (e.g., ‘blink’).

in clusters containing [l] (e.g., ‘kiln’) (cf. (iv)), another approach had to be employed in this situation. The use of long stems with diphthong nuclei seemed appropriate, though it does have a particular drawback which must be acknowledged. As Korean tolerates vowels in hiatus, there is a chance that a target form like [aul] ‘owl’ would be parsed as [a.ul] instead of [aul]. In turn, the word ‘owl’ in the present example would be analysed as if it were a disyllabic word with a short nucleus in the second syllable. Korean also allows vowel coalescence for /a+i/ nuclei in certain words (e.g., /sai/ → [sɛ] ‘gap’).⁷⁹ If the diphthong in the nucleus were lost like this, we would have another scenario in which a long stem needs to be reclassified as short.⁸⁰

- (vi) A set of bare counterparts to the inflected forms (e.g., ‘install’ cf. ‘installed’) were included. In the first place, the bare items acted as controls for various phonological processes which had the potential to occur in their inflected counterparts. For instance, suppose the KLEs involved in the experiment produced the inflected form ‘chopped’ with fortis release on the stem-final stop. Before this release could legitimately be treated as a clue to the prosodic representation that the learners were using for inflection on regulars, we would need to rule out the possibility that the incidence of fortis release in this environment was due to some other factor instead. Comparison of the release on the stem-final stop in ‘chopped’ and ‘chop’ would enable us to do this.
- (vii) I included monomorphemic forms whose codas paralleled those of the short-stemmed inflected forms in phonotactic terms; for example, each of ‘pulled’ and ‘weld’ has the coda [ld]. By comparing the rate of omission in the inflected forms with that of cluster simplification in their parallels, it would be possible to check if inflectional omission was simply an L1-based articulatory problem, or due to a prosodic deficit instead.^{81,82} Note, however, that the agreement and

⁷⁹ This does not happen in /a+u/ nuclei, however (Lee, 1993, p. 334).

⁸⁰ Another option would be to use long stems with long-vowel nuclei (e.g., ‘peek’ [pi:k], ‘rule’ [ru:l]); however, this strategy seems more risky still. Generally speaking, given the status of vowel length in standard Korean, we might expect some shortening of stems with long vowel nuclei (e.g., ‘peek’ [pi:k] → [pik]). (My vowel transcription here reflects the fact that there are no lax high vowels in Korean.) This process would be undesirable from our point of view because affected stems would need to be reclassified as short, and some of the data from the long-stemmed regulars in the experiment would be lost.

⁸¹ No monomorphemic parallel forms were included for the long-stemmed regulars. In section 3.1.2.2, we saw that there are very few monomorphemic words in English (or indeed in any other language) with four-position rhymes; therefore, it would have been difficult to assemble a full set of suitable parallels.

the plural stimuli shared a single set of parallel forms, in order to help keep the length of the task down to a minimum.

- (viii) For the agreement and plural stimuli, the stop-final stems included words ending in [t] (e.g., ‘sit’). The inclusion of these items broadened the range of stimulus types in the category of stop-final stems, thus making the coverage of agreement and plural inflection in this study more representative.

The following aspects of the methodology are also noteworthy.

- (i) For the agreement and plural stimuli, each inflected form occurred before a word beginning with either [f] or [v] in order to block resyllabification of inflection as a syllable onset.
- (ii) For the agreement stimuli, the subject and the verb were always adjacent. Hawkins and Casillas (2008) have shown that, in early L2 development, the presence of one or more terminal nodes between the subject and the verb can affect the rate at which agreement inflection is omitted.
- (iii) Each stimulus noun for plural inflection occurred inside a DP with the structure Num1 + N-pl (e.g., ‘eight bells’). For L2ers from plural-less backgrounds, Mellow and Cumming (1994), among others, have demonstrated that plural inflection is produced at different rates on bare nouns (e.g., ‘bells’) and on nouns preceded by numerals or quantifiers (I will delve into this issue in detail in experiment 3).

The complete set of stimuli for experiment 2 is shown in table 3.8. The table also includes (in parentheses) a reference to the location of each item within the story texts.

Moreover, words with the phonological shape -VVCC are relatively infrequent in naturalistic discourse (e.g., ‘mulct’).

⁸² This brings to the fore a drawback of the SR phase of the task in experiment 2 (and also experiment 3) especially. As mentioned in section 2.2.2.1, the participants were shown keywords to help them to retell the story. The problem is that the keyword for each stimulus was always a bare form (e.g., ‘drop’), but the corresponding monomorphemic parallel was a full word (e.g., ‘adopt’). Thus, we might expect production of the final consonant in each monomorphemic parallel to have been boosted by this feature of the associated keyword. This situation again reveals the advantages of triangulating the SR phase of the task with the EI phase, as there could have been no bias towards the production of [t] in ‘adopt’ over the production of inflection in ‘dropped’ in the EI phase of the task.

infl. type	verb class & stem length	stem-final cons.	inflected forms	uninflected forms	monomorphemic parallels	
tns.	irregulars	stop	slept(10.3) swept(12.4)	sleep(18.2) sweep(1.2)	opt(17.7) adopt(9.7)	
		son.	sent(27.3) spent(26.5) felt(18.2) dealt(22.1)	send(9.2) spend(15.2) feel(7.6) deal(19.5)	rant(1.5) print(9.2) melt(18.5) consult(19.7)	
	short	stop	dropped(2.7) chopped(12.6) knocked(10.5) checked(10.6)	drop(27.7) chop(17.3) knock(20.3) check(1.2)	opt(17.7) adopt(9.7) pact(10.1) act(17.5)	
		son.	scanned(27.2) banned(13.8) pulled(4.4) installed(27.4)	scan(9.2) ban(25.7) pull(13.5) install(14.7)	defend(13.6) attend(23.6) weld(25.6) build(23.7)	
	long	stop	dumped(21.4) helped(10.7) blinked(20.6) sulked(18.7)	dump(4.7) help(19.3) blink(2.6) sulk(1.3)	-	
		son.	drowned(27.8) resigned(1.7) smiled(26.6) growled(20.4)	drown(4.3) resign(7.5) smile(18.3) growl(24.3)	-	
	agr.	short	stop	stops(7.2) wraps(23.2) picks(11.6) licks(15.7) fits(7.3) sits(5.6)	stop(23.3) wrap(16.4) pick(12.2) lick(24.3) fit(21.3) sit(18.3)	lapse(22.3) collapse(3.6) fix(9.3) fox(6.2) blitz(23.6) klutz(1.4)
			son.	wins(11.7) grins(9.4) spills(24.3) sells(24.2)	win(15.5) grin(8.3) spill(8.4) sell(3.7)	cleanse(16.3) lens(21.5) false(11.3) pulse(16.6)
long		stop	jumps(6.5) yelps(6.3) thinks(6.6) milks(24.2) wants(3.7) insults(15.2)	jump(26.8) yelp(24.7) think(12.7) milk(5.3) want(7.5) insult(1.4)	-	
		son.	frowns(23.4) shines(15.3) howls(6.4) compiles(8.6)	frown(22.4) shine(14.5) howl(16.3) compile(22.6)	-	
plur.		short	stop	caps(21.3) cups(26.3) locks(3.2) ducks(3.4) pets(6.1) rats(11.4)	cap(7.3) cup(22.5) lock(14.6) duck(9.6) pet(5.2) rat(16.2)	lapse(22.3) collapse(3.6) fix(9.3) fox(6.2) blitz(23.6) klutz(1.4)
			son.	hens(5.4) pens(21.2) bells(14.4) wells(24.4)	hen(19.6) pen(14.3) bell(15.6) well(5.2)	cleanse(16.3) lens(21.5) false(11.3) pulse(16.6)
	long	stop	lamps(14.4) gulps(11.5) monks(20.2) silks(8.2) tents(23.1) belts(21.2)	lamp(9.5) gulp(16.5) monk(11.1) silk(23.2) tent(5.3) belt(26.4)	-	
		son.	clowns(21.6) mines(8.1) files(27.3) owls(5.5)	clown(7.1) mine(15.1) file(22.2) owl(14.3)	-	

Table 3.8: Stimuli for experiment 2

Table 3.8 also reveals that, due to a shortage of suitable nouns and verbs in some categories, I had to compromise in several ways when selecting the stimuli for the experiment.

- (i) I only included two stems in the irregular category, both with [p] codas (e.g., ‘slept’), because there are no irregular stems in English which end in [k].
- (ii) The item ‘silks’ (i.e., types of silk) was included in the plural category even though this noun is normally used uncountably.
- (iii) The coda [nd] in ‘banned’ and ‘drowned’ was paralleled by [nt] in ‘sent’ and ‘spent’, as no irregular verbs in English have past-tense forms ending in [nd].
- (iv) Note that inflected agreement and plural forms such as ‘sells’ and ‘files’ respectively end in [lz]. I used ‘false’ and ‘pulse’, which end in [ls], as parallels for such forms due to the scarcity of uninflected [ls]-final words in English.
- (v) A handful of the parallels were actually dimorphemic (e.g., ‘collapse’). In each case, a suitable monomorphemic parallel could not be found.

3.5 Results

Recall that, in G&W’s research on Mandarin learners of English, asymmetries in fortis release on stem-final stops played a crucial role in determining which prosodic representations were being used by these learners for tense and perfective inflection. This evidence is not available in the current experiment, as there were no occurrences of fortis release on stem-final stops anywhere in the data (e.g., [tʃɛkt] → *[tʃɛk^ht^h] ‘checked’).⁸³ Another noteworthy result was that there were no cases of rhyme-shortening in regulars (e.g., [jɛlps] → *[jɛps] ‘yelps’) anywhere in the data (cf. G&W). In section 3.4, I suggested that since Korean allows syllables to end in [l] or [m], the long-stemmed stimulus items might be expected to resist this process. This expectation appears to have been borne out. Also, among the native-speaker (NS) group, there were no cases of tense or agreement omission plus only one case of plural omission, so I will report the results for the Korean learners only.

⁸³ There were no cases of schwa epenthesis on stem-final stops either.

I start by providing some details of the statistical approach used in this thesis in section 3.5.1. I then deal with agreement in section 3.5.2, plurals in section 3.5.3 and tense in section 3.5.4 (see appendices 3.1 to 3.3 for the relevant data-sets).

3.5.1 Statistical approach

The following characteristics of this approach should be noted at this point.

- (i) Along with a conventional parametric test, I carry out a so-called ‘robust’ test for each statistical comparison of interest. Two methods of this type are utilised: 20% trimmed means and percentile bootstrapping. In this context, it is perhaps sufficient to mention that the use of 20% trimmed means is a principled technique for dealing with outlying values in a data set, especially when conducting significance testing (for more information about these techniques, see Larson-Hall & Herrington, 2010, pp. 378-383). My purpose in including the results of robust tests is that they are, by definition, relatively insensitive to violations of the assumptions of normality and equal variances.⁸⁴ This makes them more powerful than their parametric counterparts when the assumptions which underlie the appropriate use of these procedures do not hold (Larson-Hall, 2009, p. 60)—that is, in the majority of situations which confront the L2 researcher in practice. Another property of robust tests is that, in most circumstances, they are preferable to non-parametric ones: while the latter type of technique can be employed fairly effectively when the data is non-normal, at least some tests of this type (e.g., the Kruskal-Wallis test) require variances to be equal (Maxwell & Delaney, 2004). Nevertheless, I have baulked at relying solely on robust testing in this thesis: despite their advantages over parametric methods (especially in terms of dealing with outliers), these procedures have not gained a firm foothold in L2 research yet. Hence, by carrying out parametric tests in tandem with robust ones, I allow the reader to compare the statistical output obtained using both approaches. These tests (plus some statistical calculations) are performed using R.
- (ii) Even though I will be testing directional predictions, I use two- rather than one-tailed tests. The use of two-tailed tests in a directional scenario is endorsed

⁸⁴ Inspection of the boxplots in this thesis confirms that, for each pair of data sets that need to be directly compared, there is no pair in which both sets are (reasonably close to) normal.

by Howell (2009, p. 163, fn. 5) on the grounds that “[n]ature is notoriously fickle, or else we are notoriously inept at prediction.”

- (i) In addition to p -values, I report 95% confidence intervals for all tests conducted in this thesis. Confidence intervals provide more information than p -values because, in addition to indicating whether or not the null hypothesis can be rejected, they give estimates of effect size and of confidence in results (i.e., the amount of sampling error).
- (ii) Despite the fact that three participant groups are involved, no ANOVAs are performed in this thesis. I take the view that since a specific set of research predictions is tested in each experiment, nothing would be gained from carrying out the omnibus F -test that lies at the heart of the ANOVA. Instead, my approach will be to simply investigate effects for each group separately using multiple *a priori* comparisons (in the form of t -tests) for all analyses (see Larson-Hall, 2006, for an example of the same basic strategy).⁸⁵ Note that this approach is strictly consistent with the predictions of experiment 2. It also minimises the number of statistical tests that need to be performed in this thesis, thereby simplifying the analysis and, more importantly perhaps, enabling familywise error to be controlled a little less strictly.⁸⁶
- (iii) The problem of familywise error is handled using Benjamini and Hochberg’s (1995) FDR. This method operates by adjusting the alpha value on the basis of the derived set of p -values themselves. More importantly, it is not always necessary for this type of adjustment to be made. In this regard, the FDR approach to dealing with family-wise error is more forgiving than, say, the better-known Bonferroni technique, which relies on the number of tests that need to be carried out. When necessary, the alpha value is adjusted for each family of comparisons in this thesis. The value itself is determined within R.
- (iv) Each effect size is reported as Cohen’s d . Following Cohen (1988, pp. 24-27), I assume that a small effect size is at least .2, a medium effect size at least .5, and a large effect size at least .8. In keeping with this set of benchmarks, I will

⁸⁵ Although this multiple-comparison method of statistical testing is recommended by scholars such as Ruxton and Beauchamp (2008) and Howell (2009) when specific predictions have already been formulated, it is nonetheless quite customary for researchers to perform the omnibus F -test in these circumstances. Howell (p. 367) remarks: “The only reason I can think of [for doing this] is “tradition”, and that is a powerful force.”

⁸⁶ The more comparisons there are in a family, the lower the alpha value (i.e., the value above which the result is deemed not to be statistical) must be set; consequently, a t -test on one of a large family of comparisons will have less power to detect a statistical difference which actually exists.

make the further stipulation of my own that an effect size of less than .2 is negligible. In addition, I indicate effects in the predicted direction as positive values, while those in the opposite direction carry negative signs. Effect sizes are derived using the calculator at <http://www.uccs.edu/~faculty/lbecker/>.⁸⁷

- (v) Field (2009, p. 58) recommends that statistical power should be at least .8 to be adequate; therefore, in the interests of simplicity, I distinguish between only two levels of power throughout this thesis: ‘low’ if this property falls below this cut-off point, and ‘high’ otherwise. To measure the power of each *t*-test in this thesis (and to do all other power calculations), the statistical application G*Power 3.1 (Faul, Erdfelder, Lang & Buchner, 2007) is used.

3.5.2 Agreement

In section 3.1, I showed that Korean lacks inflection for agreement but incorporates tense inflection into the PWd, while agreement inflection is adjoined to the PWd in English. As we saw in section 3.3, the PTH makes certain predictions regarding the omission of agreement inflection by KLEs in this cross-linguistic scenario. Two distinct patterns can occur. In the first of these, short-stemmed inflection will be omitted at a low rate because it can be incorporated within the PWd; by contrast, long-stemmed inflection will be omitted at a high rate. The second pattern is that, in keeping with a unified analysis of regular inflection in general, omission of agreement will be high. However, under the relaxed version of the PTH, this contrast in the prosodification of regular inflection is specific to the early phase of development. Later on, this version of the hypothesis predicts that KLEs will omit agreement inflection at a low rate regardless of stem length, because they are able to build the necessary PWd-adjunction structure via minimal adaptation. It is worth adding, however, that this set of claims is predicated on the assumption that a given prosodic structure in the L1 is not tied to the construction that it is associated with, but can be utilised in the L2 for a different construction within the same domain (see (33b)).

In this section, I will start by ruling out the possibility that, for the intermediate KLEs in this experiment, the omission of agreement inflection was due to prosodic

⁸⁷ Despite the fact that this calculator is intended for use with the results of independent-sample *t*-tests only, I use it to determine effect sizes for the results of the paired-sample *t*-tests which are employed throughout this thesis (see Volker, 2006, for a defense of this approach).

factors rather than a more general L1-derived ban on final-consonant clusters. The outcome will be the same for the advanced group, though the evidence is not as strong. I will then show that, in line with the PTH, the intermediate KLEs organised agreement inflection using the PWD-internal incorporation structure where stem length permitted this.⁸⁸ We will also see that the same pattern was observed in the advanced group.

The omission rates in short-stemmed regulars, long-stemmed regulars and monomorphemic parallels to the short-stemmed forms are given for the intermediate KLEs in figure 3.3 (EI = elicited imitation; SR = story recall). Note that these rates were lower in monomorphemic parallels than short-stemmed regulars, and lower for short stems than long stems.

⁸⁸ At least, this appears to be the predominant strategy used by the members of this group. It is quite possible that some participants adopted a unified analysis of agreement inflection instead. Although we could look at the individual omission-rates for the group and try to distinguish an incorporation subgroup and an ATB subgroup from each other (as in GW&S), the relatively small numbers of participants in these subgroups would prevent us from identifying this dichotomy with confidence.

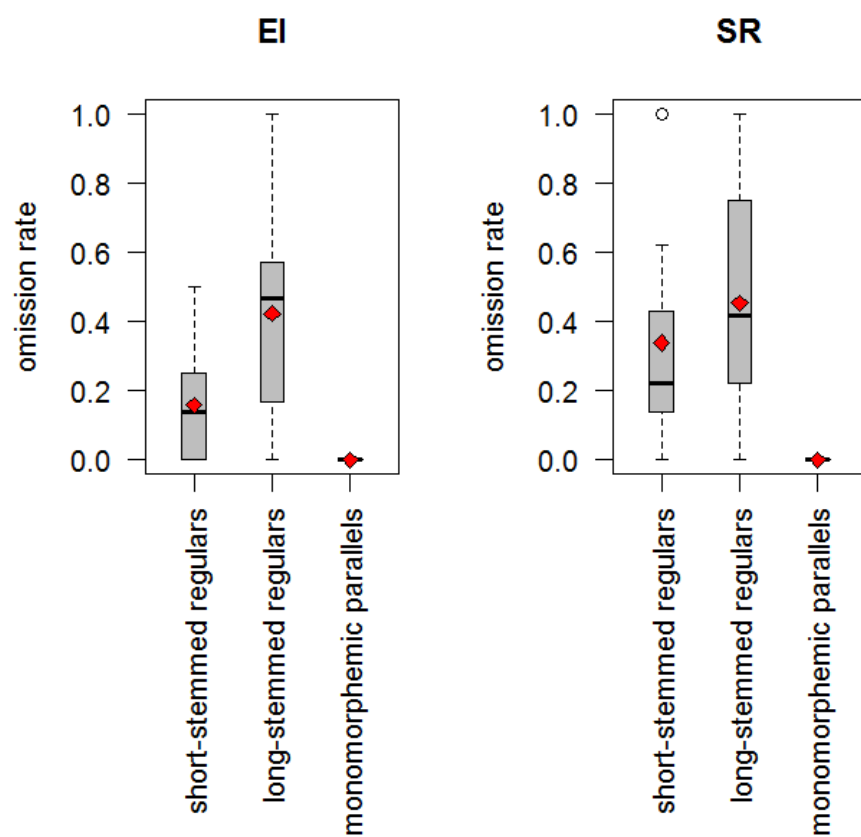


Figure 3.3: Omission of agreement inflection and [s]/[z] in monomorphemic parallels: intermediate group

The advanced rates follow in figure 3.4. The same pattern is apparent here as in the intermediate data.

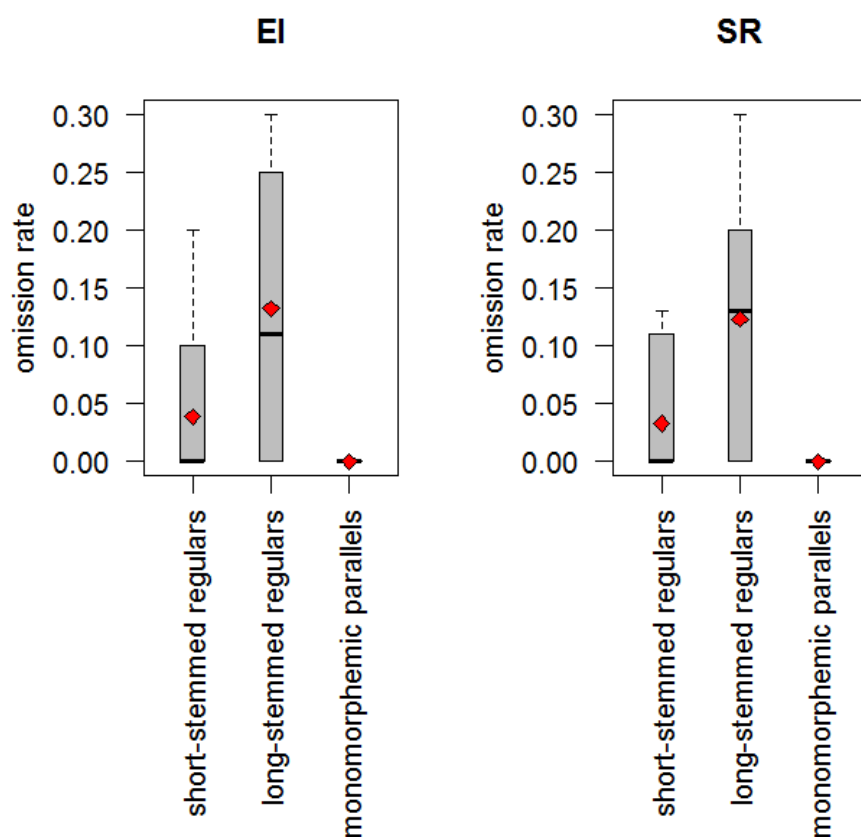


Figure 3.4: Omission of agreement inflection and [s]/[z] in monomorphemic parallels: advanced group

The statistical output comes next. Using paired-samples *t*-tests, multiple comparisons were performed in two ways: in the customary parametric fashion, and as a robust test. I will start by comparing the omission rates for short-stemmed regulars and monomorphemic parallels; this output is shown in table 3.9.

group	phase	mean (SD)		test type						effect size (<i>d</i>)	pwr.
		short regulars	mono. paras.	parametric			robust				
				<i>t</i>	sig.	95% CI	<i>t</i>	sig.	95% CI		
interm.	EI	.16 (.16)	0 (0)	3.77	.002	.07, .25	-	0	.06, .24	1.42	1.0
	SR	.34 (.32)	0 (0)	3.78	.002	.15, .52	-	0	.16, .51	1.50	1.0
adv.	EI	.04 (.07)	0 (0)	2.16	.0503	0, .08	1.39	.19	0, .07	.82	.81
	SR	.03 (.05)	0 (0)	2.27	.04	.002, .06	1.35	.20	0, .06	.86	.84

Table 3.9: Omission of agreement inflection in short-stemmed regulars and [s]/[z] in monomorphemic parallels: statistical analysis

In accordance with the FDR, the alpha value for this set of comparisons was adjusted to .002. For the intermediate group, the difference between the omission rates for short-stemmed regulars and parallels was statistical in each phase for each test type. The difference was not statistical for the advanced group in either phase regardless of test type. However, a power analysis revealed that, in each phase of the task, the result for this group was non-statistical not because there was no association between mention type and omission rate, but because the study was insufficiently powerful to detect such an association (Larson-Hall, 2009, pp. 104-111). In practice, this means that there were not enough participants in the group. The power analysis indicated that if we assumed the same effect size (i.e., .82) plus high power (i.e., .8), a statistical p -value (i.e., the adjusted value of .002 in this case) could be obtained in a replication of the present comparison if N were increased to 25 in the EI phase. In the SR phase, N would need to be increased to 23. Although this is of course a subjective issue, I assume that it would not be impractical to recruit a group of fewer than, say, 100 participants. This arbitrary cut-off point for N will be assumed in all remaining power analyses conducted in this thesis.

I show the output for the comparison between long-stemmed regulars and short-stemmed regulars in table 3.10.

group	phase	mean (SD)		test type						effect size (d)	pwr.
		long regulars	short. regulars	parametric			robust				
				t	sig.	95% CI	t	sig.	95% CI		
interm.	EI	.42 (.31)	.16 (.16)	4.01	.001	.12, .41	-	0	.12, .42	1.07	.96
	SR	.45 (.32)	.34 (.32)	1.81	.09	-.02, .25	2.02	.06	-.01, .23	.36	.24
adv.	EI	.13 (.11)	.04 (.07)	3.03	.01	.03, .16	4.04	.002	.02, .16	1.01	.94
	SR	.12 (.10)	.03 (.05)	2.95	.01	.02, .16	3.28	.006	.03, .15	1.11	.97

Table 3.10: Omission of agreement inflection in long-stemmed and short-stemmed regulars: statistical analysis

In accordance with the FDR, the alpha value for this set of comparisons was adjusted to .01. For the intermediate group, the difference was statistical in the EI phase for each test type. The difference was not statistical for this group in the SR phase regardless of test type. However, this outcome was found to be attributable to a lack of power ($N = 94$). The difference was statistical for the advanced group in both phases for each test type.

3.5.3 Plurals

We saw in section 3.1 that although Korean lacks inflection for plurals, the free-clitic structure is available in the nominal domain for particles. By contrast, plural inflection in English is adjoined to the PWd. The claims of the PTH in this situation were stated in section 3.3: the KLEs in this study will use the free-clitic structure from particles to organise plural inflection, so that regular inflection will be omitted at a low rate regardless of stem length. Note, however, that I am again assuming that an L1 prosodic structure can be used in the L2 for a different construction within the same domain (see (33b)).

As a preliminary step, I will again verify that plural inflection was omitted because of prosodic factors rather than an L1-based difficulty with the pronunciation of final-consonant clusters. However, I will only do this for the intermediate participants, as the relevant omission rates for the advanced group were zero in each phase. I will go on to argue that, based especially on the findings from the SR phase, the KLEs did not redeploy the free-clitic structure from the L1; instead, they adopted the same analysis of plural inflection as the one we saw for agreement. This was the case with the advanced participants as well, though the evidence is not as compelling for this group. Note also that, even though this asymmetry was not expected for either group, it was still consistent with the PTH; specifically, the plural results suggest that it is possible for a given prosodic structure in the L1 to be used for a construction in a different domain in the L2 (see (33c)).

The omission rates in short-stemmed regulars, long-stemmed regulars and monomorphemic parallels to the short-stemmed forms are shown for the intermediate KLEs in figure 3.5. Note that the rates were lower in monomorphemic parallels than short-stemmed regulars, and lower for short stems than long stems.

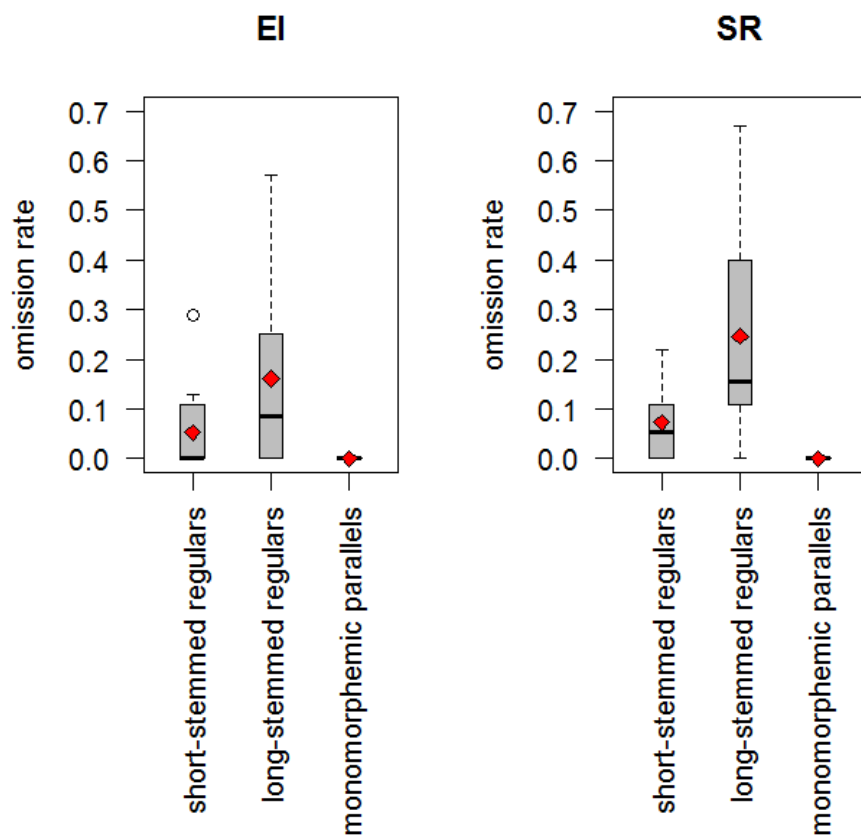


Figure 3.5: Omission of plural inflection and [s]/[z] in monomorphemic parallels: intermediate group

I give the advanced rates in figure 3.6. Note that the pattern for this group differs from the one for the intermediate group, in that there was no omission of short-stemmed inflection or [s]/[z] in monomorphemic parallels.

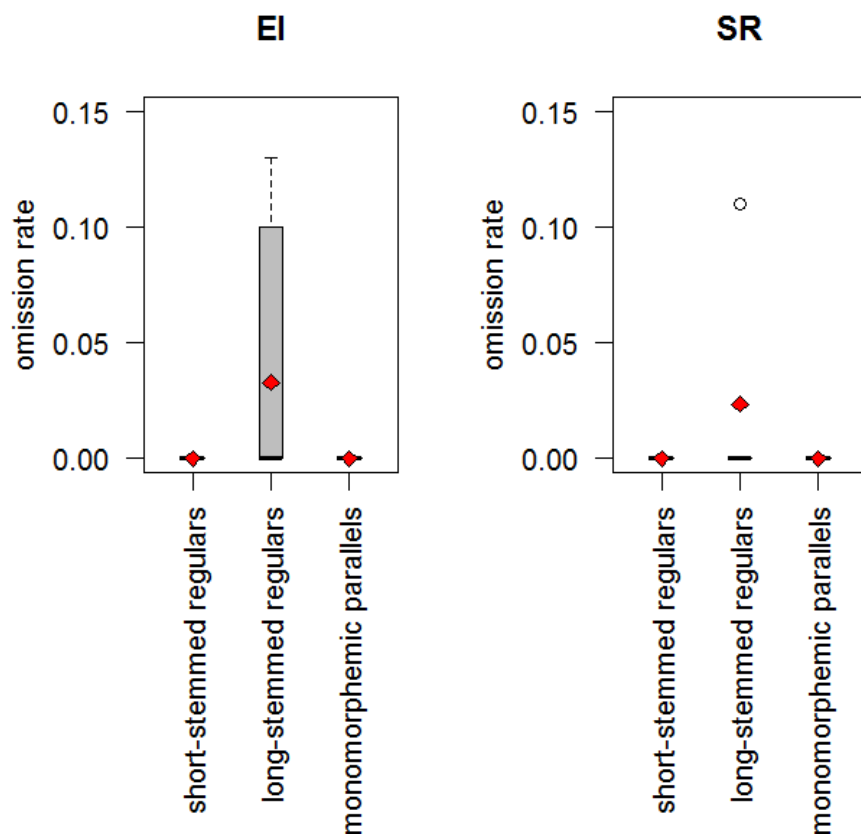


Figure 3.6: Omission of plural inflection and [s]/[z] in monomorphemic parallels: advanced group

The statistical output for each of these comparisons follows. Let us begin with the omission rates for short-stemmed regulars and monomorphemic parallels; this output appears in table 3.11.

phase	mean (SD)		test type						effect size (<i>d</i>)	pwr.
	short regulars	mono. paras.	parametric			robust				
			<i>t</i>	sig.	95% CI	<i>t</i>	sig.	95% CI		
EI	.05 (.09)	0 (0)	2.30	.04	.003, .10	2.0	.07	0, .08	.87	.85
SR	.07 (.08)	0 (0)	3.26	.006	.02, .12	3.07	.009	.01, .12	1.24	.99

Table 3.11: Omission of plural inflection in short-stemmed regulars and [s]/[z] in monomorphemic parallels: statistical analysis

In accordance with the FDR, the alpha value was adjusted to .009. The difference was statistical in the SR phase for each test type. The difference was not statistical in the EI

phase regardless of test type. However, this outcome was found to be attributable to a lack of power ($N = 20$).

The predictions for plural inflection will now be tested. The output of the comparison for long-stemmed regulars and short-stemmed regulars is given in table 3.12.

group	phase	mean (SD)		test type						effect size (<i>d</i>)	pwr.
		long regulars	short. regulars	parametric			robust				
				<i>t</i>	sig.	95% CI	<i>t</i>	sig.	95% CI		
interm.	EI	.16 (.20)	.05 (.09)	2.02	.06	-.01, .22	1.85	.09	-.01, .20	.69	.67
	SR	.25 (.22)	.07 (.08)	2.99	.01	.05, .30	3.20	.007	.05, .30	1.03	.94
adv.	EI	.03 (.05)	0 (0)	2.25	.04	0, .06	1.37	.19	0, .06	.85	.84
	SR	.02 (.05)	0 (0)	1.88	.08	0, .05	.89	.39	0, .04	.71	.69

Table 3.12: Omission of plural inflection in long-stemmed and short-stemmed regulars: statistical analysis

In accordance with the FDR, the alpha value was adjusted to .01. For the intermediate group, the difference was statistical in the SR phase for each test type. The difference was not statistical for this group in the EI phase regardless of test type. However, this outcome was attributable to a lack of power ($N = 28$). The difference was not statistical for the advanced group in either phase regardless of test type. However, each of these results was attributable to a lack of power (EI phase: $N = 20$; SR phase: $N = 27$).

3.5.4 Tense

In section 3.1.2, I showed that regular tense-inflection is incorporated into the PWD in Korean but adjoined to the PWD in English. The predictions for this type of inflection by KLEs were stated in section 3.3, and are the same as those for agreement inflection in section 3.5.1.

I will begin excluding the involvement of two articulatory problems in the omission of tense inflection, so that this behaviour can be attributed to prosodic factors instead. One of these issues is that stop-stop clusters are more difficult to articulate than other types of consonant cluster. This will be ruled out by comparing the omission of inflection on stems ending in stops and those ending in sonorants. The other articulatory problem is a general tendency to reduce final consonant-clusters if the L1 lacks them. This is, of course, the same issue that cropped up in the omission of agreement and plural inflection in sections 3.5.1 and 3.5.2 respectively. For each problem, the findings

from the intermediate group will confirm that the omission of tense inflection was prosodically-motivated. This is true for the advanced group as well, though the evidence is not as strong. Indeed, for reasons which are not clear, we will see that the omission rates were *lower* for stop-final than sonorant-final stems in each experimental condition.

I will test the predictions of the PTH for tense inflection after that. The findings for both agreement and plurals suggest that the same asymmetries will be manifested in the production of regular tense-inflection as well. However, what will emerge is that the results for tense overall do not bear out any of the predictions of the PTH (or indeed any other theory of inflectional variability that I am conversant with).

The omission rates for stop-final and sonorant-final stems are shown for the intermediate KLEs in figure 3.7 and the advanced KLEs in figure 3.8.

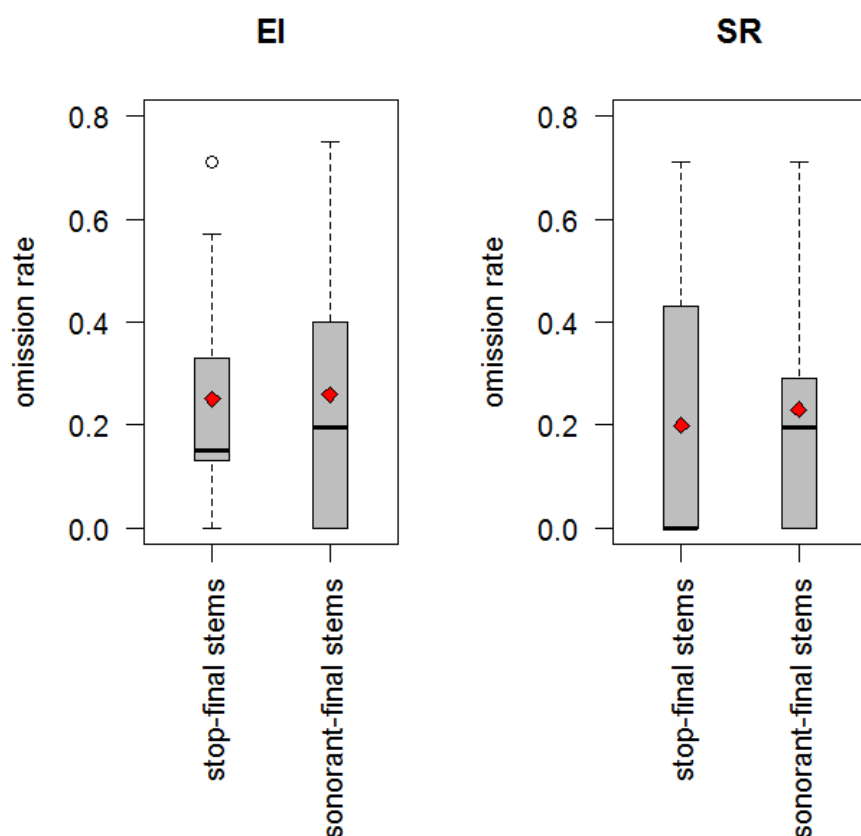


Figure 3.7: Omission of tense inflection on stop-final and sonorant-final stems: intermediate group

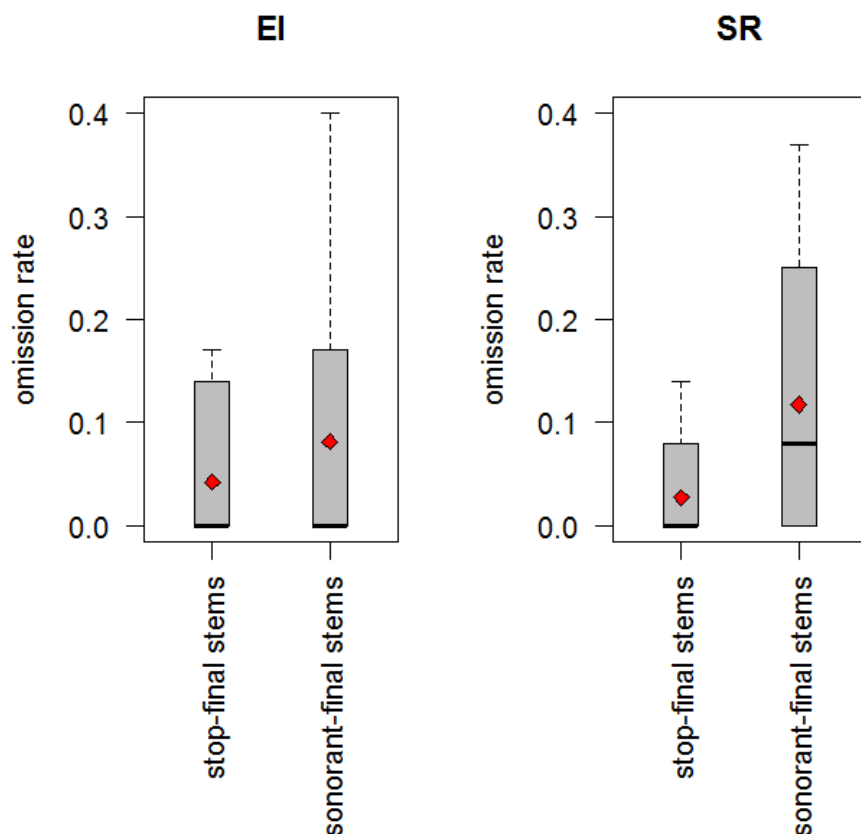


Figure 3.8: Omission of tense inflection on stop-final and sonorant-final stems: advanced group

As there is a clear pattern in these data sets (though not the expected one), I will analyse them statistically. The output for the comparisons in question is displayed in table 3.13.

group	phase	mean (SD)		test type						effect size (<i>d</i>)	pwr.
		stop-final	son.-final	parametric			robust				
				<i>t</i>	sig.	95% CI	<i>t</i>	sig.	95% CI		
interm.	EI	.25 (.21)	.26 (.25)	-.10	.92	-.18, .16	-.21	.84	-.17, .15	-.03	.05
	SR	.20 (.28)	.23 (.23)	-.52	.61	-.16, .10	-.67	.52	-.16, .09	-.12	.07
adv.	EI	.04 (.07)	.08 (.13)	-1.08	.30	-.12, .04	-.95	.36	-.09, .03	-.39	.27
	SR	.03 (.05)	.12 (.12)	-2.62	.02	-.16, -.02	-2.58	.02	-.17, -.01	-.98	.92

Table 3.13: Omission of tense inflection on stop-final and sonorant-final stems: statistical analysis

For the intermediate group, the difference was not statistical in either phase regardless of test type. For the advanced group, the difference was not statistical in the EI phase regardless of test type, but statistical in the SR phase for each test type.

The omission rates in short-stemmed regulars, long-stemmed regulars, irregulars, and monomorphemic parallels to the short-stemmed forms are shown for the intermediate KLEs in figure 3.9. Note that the rates were lower in monomorphemic parallels than short-stemmed regulars, and that inflection was omitted more frequently in short-stemmed regulars than irregulars in each phase of the task. However, in other respects, it is difficult to make out a clear pattern in the omission rates for the inflected forms.

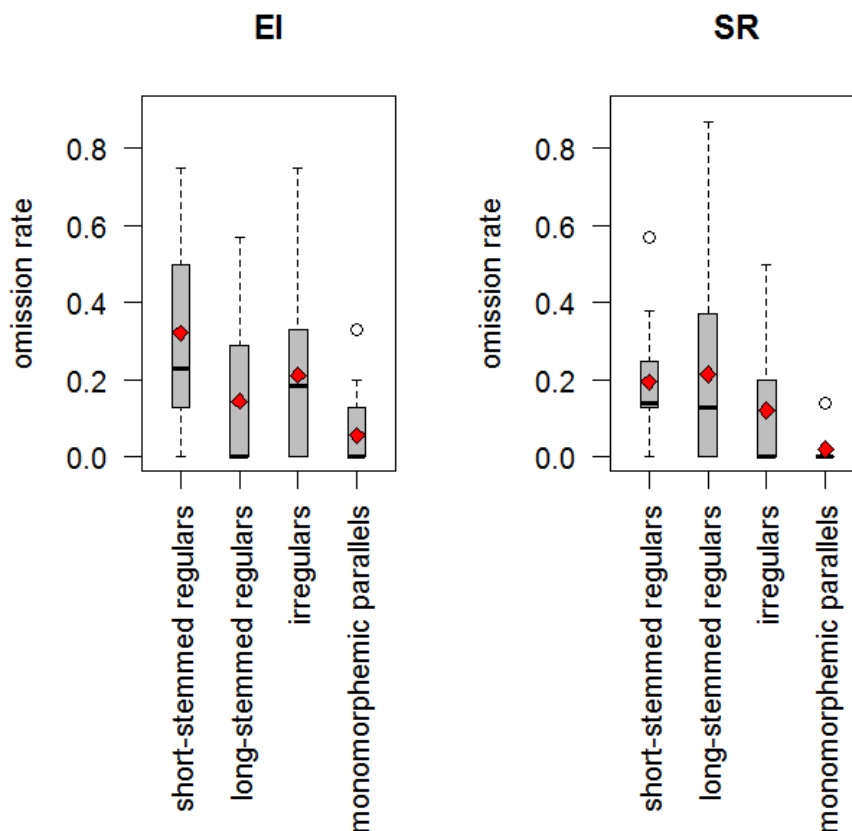


Figure 3.9: Omission of tense inflection and [t]/[d] in monomorphemic parallels: intermediate group

The omission rates for the advanced KLEs are shown in figure 3.10. For the SR phase of the task, these rates were lower in monomorphemic parallels than short-stemmed regulars. Otherwise, a clear pattern among the omission rates for tense is again lacking.

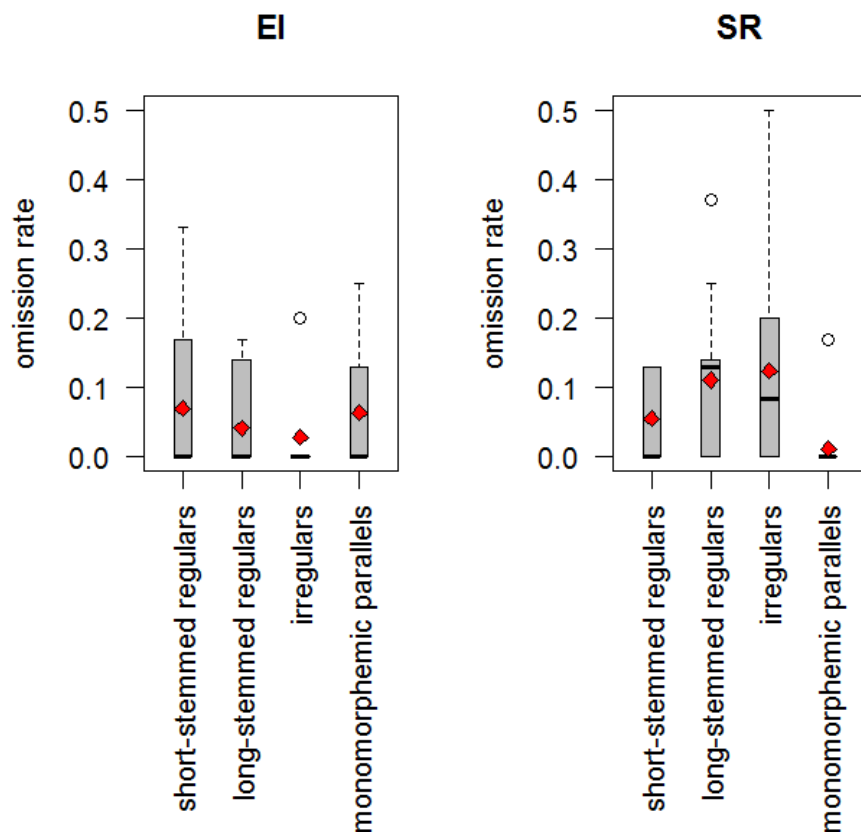


Figure 3.10: Omission of tense inflection and [t]/[d] in monomorphemic parallels: advanced group

Since a clear pattern is evident in these data sets, I give the statistical output for the relevant comparison in table 3.14.

group	phase	mean (SD)		test type						effect size (<i>d</i>)	pwr.
		short regulars	mono. paras.	parametric			robust				
				<i>t</i>	sig.	95% CI	<i>t</i>	sig.	95% CI		
interm.	EI	.32 (.24)	.06 (.10)	3.78	.002	.11, .42	-	0	.11, .42	1.45	1.0
	SR	.19 (.19)	.02 (.05)	3.70	.003	.07, .28	-	0	.07, .27	1.27	.99
adv.	EI	.07 (.11)	.06 (.10)	.15	.89	-.09, .10	.10	.92	-.09, .10	.06	.05
	SR	.06 (.07)	.01 (.05)	1.83	.09	-.01, .10	2.15	.05	0, .09	.76	.75

Table 3.14: Omission of tense inflection and [t]/[d] in monomorphemic parallels: statistical analysis

For the intermediate group, the difference was statistical in each phase for each test type. For the advanced group, the difference was statistical in the SR phase for the robust test, but it was not statistical in this phase for the parametric test. However, this outcome was attributable to a lack of power ($N = 16$). The difference was not statistical in the EI phase.

I will now test the predictions for tense inflection. A numerical summary is given in table 3.15.

group	phase	mean (SD)		
		long-stemmed regulars	short-stemmed regulars	irregulars
interm.	EI	.15 (.20)	.32 (.24)	.21 (.22)
	SR	.21 (.27)	.19 (.19)	.12 (.17)
adv.	EI	.04 (.07)	.07 (.11)	.03 (.07)
	SR	.11 (.11)	.06 (.07)	.12 (.15)

Table 3.15: Omission of tense inflection in short-stemmed regulars, long-stemmed regulars, and irregulars: numerical summary

Notice that the prediction for omission errors was not supported, as no clear pattern in the results is detectable. Under the PTH, we would expect to see the omission rates decrease as we move from left to right in the table, but this does not happen.

3.6 Discussion

Let me summarise the findings from section 3.5, starting with the ones for agreement inflection. These results have significant implications for research on the PTH. From one standpoint, this hypothesis was supported; specifically, they suggest that the KLEs in experiment 2 predominantly incorporated this material into the PWd where the length of the stem permitted. This outcome also confirms that, more generally, a prosodic structure in the L1 can be used in the L2 for a different construction within the same

domain (see (33b)). In this light, the restriction imposed on prosodic transfer by Goad and White (2006a, pp. 213-214) (such that difficulties in morphological production will arise unless the target representation is available *for the same construction in the L1*) may not, in fact, be necessary.

Yet, in another key respect, the findings for agreement were unexpected as well. Note that the PWD-internal incorporation structure was used by the advanced participants as well as the intermediate ones. Under the relaxed formulation of the PTH, we might have anticipated that the advanced group would acquire PWD adjunction via minimal adaptation instead. This finding also necessarily means that one other prediction of the PTH was not corroborated; specifically, there was no clear-cut evidence that the KLEs in this study were using PWD adjunction not only for regular inflection but also for irregular inflection. Admittedly, it is also possible that these participants may simply have fossilised, or (although placed at advanced level at the outset of the study) may not have progressed far enough in their interlanguage development to be able to minimally adapt the PWD adjunction structure in the L2. One cannot tell for sure. The upshot is that the PTH needs to be tested in other cross-linguistic scenarios in which PWD adjunction in the L2 can be minimally adapted from PWD-internal incorporation in the L1.

If anything, the plural results were even more surprising than those for agreement. As before, the KLEs employed the PWD-internal incorporation structure where feasible for this type of inflection, so that plural omission followed a pattern whose overall shape, at least, was explicable in terms of prosodic transfer. This aspect of the plural results shows the PTH in a favourable light. The curious thing, however, is that the KLEs in this study used PWD-internal incorporation for plural inflection even though a structure was available in the L1 for a different construction within the same domain (i.e., free cliticisation for particles). Under (33c), this is not permitted. Note also that, as with agreement inflection, the PWD-internal incorporation structure was used by advanced as well as intermediate learners.

It is unclear why the KLEs in this study should have employed this particular structure. One reason worth considering is that when an L1 structure is chosen for redeployment in the L2, the need to minimise cognitive effort (by using an L1 prosodic representation which, at the very least, originates in the same domain) can be overridden by other factors. In the present scenario, it is possible that the free-clitic structure available in the L1 is inherently unsuitable for organising plural inflection on syntactic

and/or semantic grounds, so that the PWD-internal incorporation structure must be appropriated for this purpose from the verbal domain.⁸⁹ True, there are languages in which plurality is encoded by items which, at least at a cursory glance, lay claim to being clitics.⁹⁰ In (34), I provide an example from Dogon (Mali) (from Plungian, 1995, p. 10).

- (34) $\epsilon\epsilon$ pilu g ϵ mbe
 goat white DEF plural
 ‘the white goats’

Notice that *mbe* behaves like a typical clitic: it appears last in the NP and attaches to the preceding item, regardless of which lexical class this item happens to belong to (Corbett, 2000, p. 152). Examples such as (34) notwithstanding, the use of plural clitics is by no means a common strategy cross-linguistically; indeed, in a survey of 957 languages, Dryer (2005, p. 138) reports that they occur in only 59. Plural inflection across languages tends to be marked on the noun itself, though there may also be number agreement with other items within the DP. As shown in (35), Spanish is one such language (example adapted from Montrul, 2004, p. 32).

- (35) esos niños traviosos
 that(MASC.PL) boy(MASC.PL) naughty(MASC.PL)
 ‘those naughty boys’

Although this explanation for the plural results seems promising enough, more research is needed in which a free clitic can be trumped by either an affixal clitic (adjoined to the PWD) or an internal clitic (incorporated within the PWD) as the representation of choice when a functional morpheme is prosodified.⁹¹

⁸⁹ Although this possibility has nothing to do with prosodic transfer, it must be taken into account in the present context. It also means that, in any given scenario in which they are utilised, the set of assumptions in (33) may need to be modified to accommodate the particular syntactic and semantic characteristics of the constructions involved.

⁹⁰ Crucially, these items express ‘pure’ plurality rather than a quantifier-type meaning such as ‘many’ or ‘few’ (Corbett, 2000, p. 135).

⁹¹ Along similar lines, another reason (though, again, not one that is consistent with the PTH) why PWD-internal incorporation might have been used for plural inflection in this instance is that this prosodic structure is somehow ‘better’ than free cliticisation (and perhaps also PWD adjunction) for organising functional material in general, not just plural inflection. If so, this could be because incorporation requires the functional morpheme to adhere more tightly to its host than in other prosodic representations. For

To recap, the findings for plural inflection revealed a pattern of inflectional omission that was consistent with the PTH in terms of its overall shape, but which, contra this hypothesis, manifested itself in an unexpected domain. When we turn to the results for tense inflection, we encounter a situation which is more problematic still, as none of the predictions of the PTH for this type of inflection was supported. Granted, the omission rates for each proficiency group were lower in monomorphemic parallels than short-stemmed regulars: while this result does not bear out any of the specific predictions of the PTH in experiment 2, it does suggest that, on a general level, the omission of tense inflection in this study was at least partly due to prosodic transfer. In addition, the omission rates for the intermediate learners were higher in short-stemmed regulars than irregulars in each phase of the task—another result which was in keeping with the PTH. In other respects, though, it would be fair to conclude that there was no discernible pattern among the tense results for either proficiency group.

As with the findings for plurals, I will begin by eliminating the possibility that stimulus and participant effects might have been implicated in this situation. Let us examine the excluded items themselves. As we can see from table 3.16, relatively few experimental conditions contained outliers.

group	phase	stem length (or verb class)	item(s)
intermediate	EI	short	
		long	resigned
		irregular	
	SR	short	
		long	
		irregular	
advanced	EI	short	dropped
		long	resigned
		irregular	spent
	SR	short	
		long	
		irregular	

Table 3.16: Omission of tense inflection: excluded stimuli

example, Demuth and Tremblay (2008) argue that French-speaking children begin by prosodifying determiners PWd-internally, only later allowing this morpheme to be hosted in its target representation as a free clitic. At the same time, Demuth and Tremblay's findings pertain to L1 rather than L2 acquisition, so at best they can only be suggestive in the present context.

The possible involvement of participant effects in the findings for tense inflection will be examined next. Table 3.17 shows that relatively few conditions contained outlying scores.

group	phase	stem length (or verb class)	participant ID
intermediate	EI	short	
		long	
		irregular	
	SR	short	IK13 and IK14
		long	
		irregular	
advanced	EI	short	
		long	
		irregular	AK5 and AK8
	SR	short	
		long	AK5
		irregular	

Table 3.17: Omission of tense inflection: outlying individual scores

A more satisfying explanation for the tense results is that they have something to do with syntactic transfer of this form of inflection from Korean. That is, I am speculating that the presence of tense inflection in the L1 may have had the effect of sensitising the KLEs to its presence in the L2, effectively nullifying the asymmetries in inflectional omission that the use of a non-target prosodic structure might have otherwise induced. So, although the findings for plural inflection in experiment 2 indicated that prosodic structures can be decoupled from their associated syntactic constructions, it is apparently still possible for syntactic transfer to mask the effects of prosodic transfer under certain circumstances. We need more research to be conducted on the PTH in cross-linguistic situations in which this type of masking effect can occur.

3.7 Chapter conclusion

In experiment 2, I predicted asymmetries in the use of TAP morphology by KLEs based on contrasts in stem length and verb class. These claims were based on the PTH, which essentially states that L2 prosodic representations are constrained by those available in the L1. We saw, however, that the results of the study were something of a mixed bag. The findings for agreement and plural inflection indicated that, in keeping with the PTH, inflection was being omitted more frequently on long-stemmed than short-stemmed regulars. This asymmetry indicated that the KLEs in this study were mostly

incorporating regular inflection into the PWD, in line with the L1 representation for tense inflection, rather than using the target PWD-adjunction structure for this type of material. At the same time, it was perhaps surprising that this pattern should have revealed itself in the advanced as well as intermediate data. This result was more in keeping with the strong version of the PTH than with the relaxed version which superseded it.

More significantly, the evidence suggests that the KLEs were using the PWD-internal incorporation structure to prosodify plural inflection even though an L1 structure was available within the same domain. I tentatively attributed this result to the fact that, cross-linguistically, plural inflection tends not to be prosodified as a clitic.

While the results for agreement and plural inflection did not bear out the PTH in all respects, they did at least follow a pattern that revealed the effects of prosodic transfer in general terms. The tense results, however, were a different matter. Although certain aspects of these findings hinted at the involvement of prosodic factors, no clear pattern emerged. I speculated that syntactic transfer of tense inflection from Korean had obscured the asymmetry in omission rates that might otherwise have manifested itself.

Another notable aspect of the results of experiment 2 is that, for agreement and plural inflection at least, they are similar to the ones obtained for the incorporation subgroup of Mandarin learners of English in GW&S. Needless to say, this also means that the present set of findings differ from those of G&W for Mandarin learners. One inference that can be drawn from this comparison is that it strengthens the possibility that the results reported by G&W were indeed influenced by task effects.

On the basis of the findings of experiment 2, I also identified the need for further testing of the PTH in cross-linguistic scenarios in which the following conditions hold: PWD adjunction in the L2 can be minimally adapted from PWD-internal incorporation in the L1; a free clitic can be trumped by either an affixal clitic or an internal clitic when a functional morpheme is prosodified; and prosodic transfer can be masked by syntactic transfer.

The next chapter is also concerned with plural inflection. This time, however, we will be interested in comparing the omission rates for this morpheme in contrasting types of QP.

Chapter 4

Experiment 3: Plurals in concorded and bare QPs¹

4.0 Introduction

In a QP such as ‘five ducks’ in English, an element expressing semantic plurality (in this case, a numeral) contracts a number-concord relation with a plural noun. Within existing research on the L2 production of plurals in various kinds of QP, two diametrically-opposed theories of morphological variability are of particular interest. According to the Efficiency Hypothesis, a drive towards communicative efficiency causes inflection to be omitted more frequently when the QP contains a concording item than when it is bare (e.g., ‘ducks’) (Littlewood, 1981). The Priming Hypothesis, by contrast, holds that the concording item primes the plural inflection on the noun, leading to increased rates of suppliance of this morpheme (Mellow & Cumming, 1994). Which of these effects is actually observed in a given situation is assumed to depend on the type of task employed: efficiency comes into play under cognitively demanding circumstances (e.g., in spontaneous conversation), whereas priming occurs when the learner has sufficient time to plan her utterances (e.g., in a writing task).

Each of these hypotheses has attracted a moderate amount of attention in the literature concerned with plural marking in L2 production (Maas, 1996; McIlwain & Peterson, 2005; Young, 1988, 1993), or can be readily tested using the results of studies conducted for other purposes (Bruhn de Garavito, 2008; Dao, 2007). The results of these investigations suggest that, in addition to task type, the effects of both efficiency and priming are conditioned by the presence or absence of plural marking in the L1; however, these conclusions can only be tentatively drawn at this stage. For one thing, sample size was a concern in Young (1988), plus his findings were probably biased at least to some extent by the inclusion of so-called measure expressions (e.g., ‘five

¹ The essential findings of this experiment were presented in Austin (2010a, 2010b). Note, however, that only a subset of the data analysed in experiment 3 was used in each presentation.

days'). In addition, Mellow and Cumming (1994) used a task which may have allowed the participants relatively easy access to metalinguistic knowledge. In experiment 3, I investigate a subset of these research implications by focusing on the priming of plural inflection in QPs by Korean learners of English (KLEs), a group whose L1 effectively lacks plural marking.

In addition, the present study builds on previous work dealing with efficiency or priming in L2 plural production in two ways: it explores the consequences of varying the structure of one type of QP along a novel dimension, and it takes into account the possibility that, due to semantic factors, different quantifiers might prime the suppliance of plural inflection to differing degrees.

The chapter is organised as follows. In section 4.1, I analyse the syntactic and semantic characteristics of the English QPs that will be investigated in this chapter. I will also operationalise the important concept of distance for the purposes of experiment 3. In section 4.2, I review a collection of relevant key studies. The prediction of the current experiment is also included in this section. Those aspects of the methodology which are specific to experiment 3 are described in section 4.3. The results follow in section 4.4. In section 4.5, I discuss these findings in light of the predictions formulated earlier. I wrap up chapter 4 in section 4.6.

4.1 Theoretical background

In section 4.1.1, I cover the syntactic and semantic characteristics of the QPs of interest in this chapter. The key concept of distance is discussed in section 4.1.2.

4.1.1 Syntactic and semantic characteristics of English QPs

The full set of QPs that will feature in experiment 3 is shown in table 4.1.²

² Given that I am treating Korean as effectively plural-less (but see below), it follows that if there are any differences among the rates at which this L1 group supplies plural inflection in the structures shown in table 4.1, these differences cannot be due to transfer. For this reason, I see no compelling justification for analysing the syntactic properties of the equivalent structures in Korean here. (As I explained in section 3.1.1, plural marking is obligatory in Korean when the intended meaning is a plural demonstrative. For the sake of consistency, I will not be examining the production of plural demonstratives in experiment 3.)

type of QP	structure of QP	example
concorded	Numl + N-pl	five dogs
	Numl + Adj + Adj + N-pl ⁴	five hungry white dogs
	'some' + N-pl	some dogs
bare	N-pl	dogs

Table 4.1: Types of QP investigated in experiment 3

Several assumptions will be made in this chapter about the syntactic characteristics of these QPs:

- (i) In the QPs 'five dogs' and 'some dogs', the numeral 'five' and the quantifier 'some' occupy the same structural position (i.e., Q). One piece of evidence for this analysis is that, in contrast to quantifiers such as 'all' and 'the', 'five' and 'some' can occur postverbally in an existential sentence. This contrast is illustrated in (1) (example adapted from Vangsnes, 2001, p. 255).⁵

- (1) There were some linguists/three linguists/*all linguists/*the linguists at the meeting.

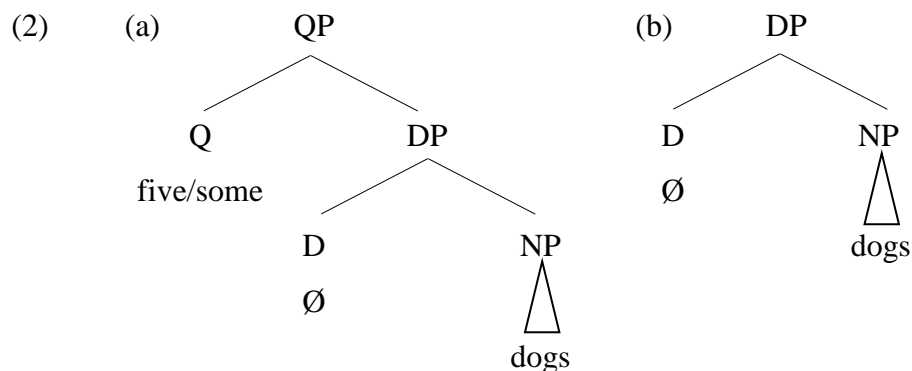
Stronger evidence comes from the fact that it is impossible for 'five' and 'some' to co-occur (e.g., '*some five dogs'/'*five some dogs'; cf. Gebhardt, 2009, p. 80).⁶

⁴ There is no particular reason why two adjectives were used in this type of QP rather than only one (or, indeed, more than two).

⁵ The contrast exemplified in (1) is the basis for the more general distinction between 'strong' quantifiers (e.g., 'all', 'every', 'each') and the determiner 'the' on one hand, and 'weak' quantifiers (e.g., 'some', 'few', 'many', numerals) on the other (Barwise & Cooper, 1981; Milsark, 1977).

⁶ However, this diagnostic of syntactic co-occurrence must be employed judiciously. The first caveat is that a ban on the co-occurrence of two items does not *necessarily* indicate that they occupy the same structural position. For example, consider '*the some dogs': within Gebhardt's (2009) schema, for instance, 'the' and 'some' occupy different heads; yet the structure is unacceptable. Klinge (2005, p. 164) suggests that this is because the semantic indefiniteness inherent in 'some' clashes with the definiteness inherent in 'the'. Second, notice that 'some' and 'five' can co-occur in a structure like 'some five dogs' if 'some' means 'approximately'. Ostensibly, this suggests that 'some' and 'five' also occur in different structural positions in this instance; however, consider the evidence to the contrary. To begin with, 'some' does not have the semantic force of a canonical quantifier in 'some (= approximately) five dogs'. Notice also that '*five some dogs' (where there is no evidence that 'some' is being used as anything other than a quantifier), plus parallel examples based on other weak quantifiers such as 'many' (e.g., '*many five dogs'/'*five many dogs'), are all unacceptable. If the 'some' in 'some (= approximately) five dogs' were a quantifier, we would have to account for the fact that only this structure out of the four just mentioned is acceptable. (As for the precise location of 'some' in 'some (= approximately) five dogs', this is an issue which would need to be investigated more deeply than is feasible in the present study.)

- (ii) The structures for ‘five/some dogs’ and ‘dogs’ are as shown in (2a) and (2b) respectively.⁷



The structure in (2a) is adapted from Cardinaletti and Giusti’s (2005; see example (65a)) refinement of Giusti’s (1991) model of QP structure. Cardinaletti and Giusti’s analysis has the undoubted advantage of parsimony: as shown in (3a) and (3b) respectively, it assigns the same syntactic structure to a QP in which a definite article can occur before the noun, and a QP in which this is not possible (examples from Cardinaletti & Giusti; see examples (65a) and (65c)).^{8,9}

- (3) (a) [QP [Q many [DP [D ∅ [... [NP men]]]]]]
 (b) [QP [Q all [DP [D the [... [NP men]]]]]]

- (iii) My analysis of a QP such as ‘five hungry white dogs’ follows Bošković’s (2005) treatment of adjectives. Bošković distinguishes between two ways in which a structure containing this type of item can be handled: AP-over-NP (Abney, 1987), and NP-over-AP. He argues that both of these approaches are

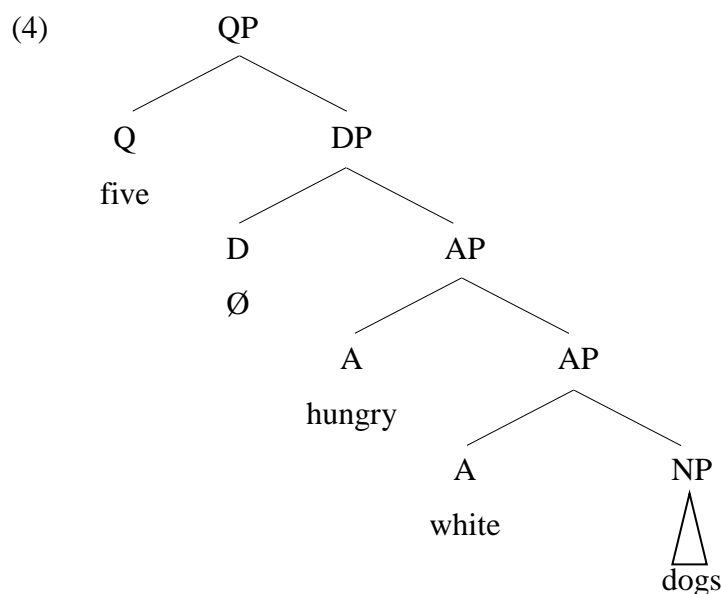
⁷ Notice that the structure in (2b) is not analysed as a QP. For the sake of simplicity, I am using the label ‘QP’ for all of the structures in table 4.1. This is preferable to using a more accurate but also more cumbersome label such as ‘QPs/DPs’.

⁸ As the examples in (3) suggest, whether a definite article is allowed to occur within the QP or not appears to be conditioned by the distinction between strong and weak quantifiers (cf. fn. 5).

⁹ At the same time, it must be conceded that a structure such as (2a) could be regarded as controversial in one respect. The principle of structural economy (Chomsky, 2001; Rizzi, 1997) requires that we project only as much structure as is actually required; therefore, the use of empty categories should be avoided wherever possible. (The empty category in (2b) seems well-motivated (Abney, 1987), so no such concern arises here.) For example, in his proposal to split CP into various projections, Rizzi suggests that Force and Fin should be syncretised into a single C head if neither of the intervening heads (i.e., Top and Foc) is filled. I take the view here that the advantage of parsimony inherent in Cardinaletti and Giusti’s structure makes the inclusion of the empty category here justifiable.

valid, but under different circumstances; specifically, if the language in question has a DP, the AP-over-NP pattern will be used; otherwise, the language will employ the NP-over-AP pattern. The motivation for this dichotomy is that, unlike an NP, an AP cannot have the status of an argument. Bošković assumes that AP-over-NP is the default configuration; hence, if the language lacks a DP, the NP-over-AP pattern is used so that an AP can be covered by an NP.¹⁰ As English has a DP, the pattern used in this language is AP-over-NP.

The AP-over-NP approach can be extended in straightforward fashion to a structure containing more than one adjective (Alexiadou & Wilder, 1998, p. 310). The structure of the QP ‘five hungry white dogs’ will then be as depicted in (4).



- (iv) Even though it can still be expected to prime the suppliance of plural inflection, the quantifier ‘some’ is less strongly associated with plurality than a numeral is. First, while ‘some’ typically precedes a plural noun, as in (5a), it can also precede an uncountable noun, as in (5b), or (less often) a singular noun, as in (5c).

¹⁰ In a structure containing more than one adjective, there are also constraints on the relative ordering of these adjectives (e.g., Sproat & Shih, 1988, 1991); for example, compare ‘four hungry white dogs’ with ‘*four white hungry dogs’. For our own purposes, these restrictions are not significant, as all of the stimulus QPs in this study containing two adjectives follow the unmarked ordering (see Alexiadou & Wilder, 1998, for more discussion of adjective ordering).

- (5) (a) Fred saw some dogs.
 (b) Fred saw some milk.¹¹
 (c) Fred saw some guy (= a specific guy).¹²

Also, when used in a sentence like (5a), ‘some’ denotes a more vaguely-defined number of referents than a numeral.

In addition to these assumptions, I will be using the quantifier ‘some’ in its ‘weak’ rather than ‘strong’ sense (Milsark, 1977; cf. fn. 4). These uses are exemplified in (6a) and (6b) respectively. Note that the pronunciation of ‘some’ is phonetically reduced to ‘sm’ when it is used in its weak sense.

- (6) (a) I ate sm sausages.
 (b) I ate some sausages.

In (6a), the focus is on the act of eating, and on what I ate; the number of sausages itself, by contrast, is “indeterminate but probably not large” (Milsark, 1977, p. 18). In (6b), the main implication is that I ate a subset of the class of sausages. As Milsark suggests, the latter meaning of ‘some’ is close to its meaning in the partitive structure ‘some of the sausages’. This use of ‘some’ is deemed to be ‘strong’ because, like the partitive structure, it resists occurring postverbally in an existential sentence.¹³ This restriction is illustrated in (7).

- (7) * There were some of the sausages in the freezer.

4.1.2 Distance

It is generally accepted that a dependency is more difficult to process when the two items which contract the relation are separated than when they are adjacent. This is

¹¹ Even though pluralised noncount structures like ‘some coffees’ (meaning either ‘some varieties of coffee’ or ‘some cups of coffee’) do occur with certain nouns, these forms are likely to be relatively infrequent in naturalistic discourse.

¹² I assume that ‘some’ in this sentence is not a quantifier, but a determiner expressing specificity.

¹³ This means that the ‘some’ in (1) is actually ‘sm’.

because, all the while that the first item is held in working memory, the material which intervenes between this item and the second one must also be processed (J. Hawkins, 2004, p. 173).

An important feature of studies concerned with dependencies is that this notion of distance is not always operationalised the same way. O’Grady, Lee and Choo (2003), in particular, draw an important distinction between linear and structural measures of distance. For example, Gibson (2000) calculates this property by counting the number of ‘discourse referents’ (i.e., NPs or tensed verbs, in his model) which intervene between the two items involved. This is a *linear* metric for distance. By contrast, *structural* distance is measured by counting how many maximal projections intervene between the items (O’Grady, 1997). A more complex interpretation of distance than either of these is implicit in Hawkins’ (2004) idea of a ‘filler-gap domain’.¹⁴ This

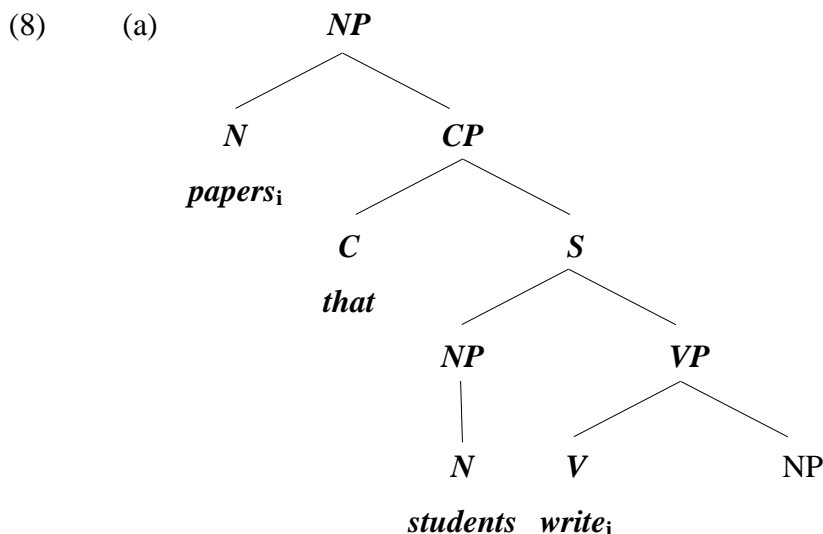
consists of the smallest set of terminal and non-terminal nodes dominated by the mother of the filler and on a connected path that must be accessed for gap identification and processing; for subcategorized gaps the path connects the filler to a co-indexed subcategorizer ... (p. 175).¹⁵

Thus, Hawkins’ idea of counting nodes essentially conflates the linear with the structural interpretations of distance. I give examples of filler-gap domains in (8) (adapted from p. 176); in each case, the nodes which belong to the domain are in bold italics.¹⁶ Each tree depicts an NP which contains a relative clause.

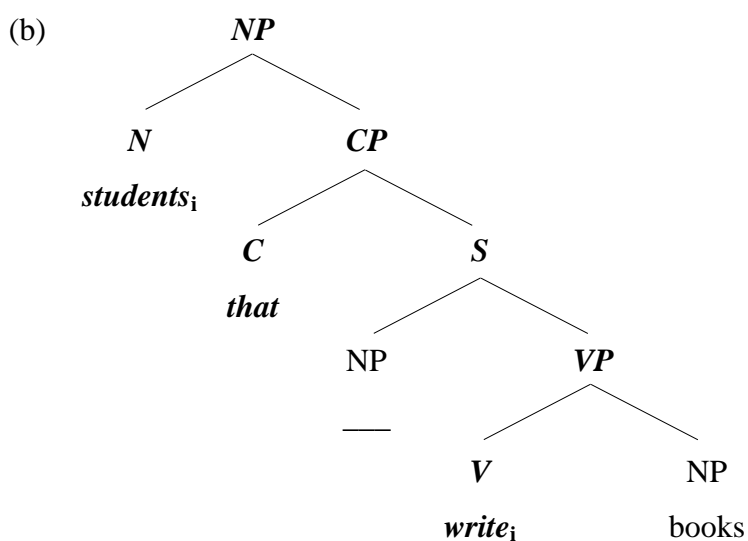
¹⁴ Although ‘filler’ and ‘gap’ refer specifically to a moved item and its trace respectively, Hawkins’ metric for calculating distance within this type of domain is applicable to dependencies in general.

¹⁵ That is, the filler-gap domain is demarcated by the filler and its *subcategorizer*, not the filler and the gap itself. Hawkins’ rationale for defining the filler-gap domain in this way is that it shortens the domain, thus making the job of processing this domain more efficient (see the discussion on pp. 172-173).

¹⁶ The structure in (8) adopts Hawkins’ ‘trace-less’ approach to representing dependencies (see fn. 15). Another feature of this tree is that I follow Hawkins in treating each of ‘papers’ in (8a) and ‘students’ in (8b) as an N rather than, say, an NP dominating an N. This is not a crucial issue: what matters here is that the tree in (8a) is more complex than the one in (8b). I also apply the schema that Hawkins lays out for calculating the number of nodes in a filler-gap domain (see pp. 178-179), but with one modification: whereas Hawkins omits the nodes CP and C, I include them. This difference in approach is not important in this context either.



‘papers that students write’



‘students that write books’

Notice that the filler-gap domain in (8a) consists of nine nodes, while the one in (8b) consists of seven; hence, by Hawkins’ metric, the former domain is more complex.

The concept of distance will come into play in section 4.2.3 when I make predictions about the differential suppliance of plural inflection in QPs like ‘five hungry white dogs’ and ‘five dogs’. As far as this study is concerned, it is immaterial whether we measure distance by counting maximal projections (O’Grady, 1997) or nodes (Hawkins, 2004): the predictions which are associated with the comparison of interest

will be the same either way. However, Gibson's (2000) metric cannot be utilised in the present context. Since adjectives do not qualify as discourse referents, in Gibsonian terms the numeral and the noun are the same distance apart in 'five hungry white dogs' and 'five dogs'.

4.2 Review of previous research

This section looks at several key studies on the suppliance (or omission) of plurals by L2ers in various types of QP.¹⁷ In section 4.2.1, I explain the Efficiency Hypothesis and the Priming Hypothesis. Section 4.2.2 summarises the studies themselves, and section 4.2.3 discusses the research implications which will be pursued in experiment 3.

4.2.1 Efficiency and priming in L2 plural production

The two theories of interest in this chapter are the Efficiency Hypothesis (EH) (Littlewood, 1981) and the Priming Hypothesis (PH) (Mellow & Cumming, 1994).¹⁸ Each theory depends crucially on the presence of a particular type of item which signals number (i.e., a numeral, partitive, quantifier or plural demonstrative) within the QP in which the plural noun occurs. At the same time, neither of these theories is predicated on any assumptions about whether the L1 has plural inflection or not, plus earlier studies have targeted groups of learners from language backgrounds with and without plurals. Therefore, even though the present experiment is concerned with plural-less learners only, the disciplinary context for this study properly includes research on learners from both types of L1 background.¹⁹

Let me explain each hypothesis. According to the EH, "a linguistic feature is more likely to be omitted [in interlanguage production] when it is redundant to the meaning being conveyed, more likely to be produced when it transmits necessary information" (Littlewood, 1981, p. 151). This omission is hypothesised to occur under conditions which tax the speaker's processing abilities, and which require communication to be maximally efficient in response to these demands. Littlewood's proposal has crucial implications for L2 plural production in concorded QPs: as the concording element itself signals plurality, the plural marking on the noun becomes

¹⁷ In addition to QPs, these studies also examine bare plurals and, in some cases, plural demonstratives (e.g., 'these dogs'). Neither of these structures is typically analysed as a QP. Despite this, I will use the label 'QP' for the full range of structures which feature in these studies (cf. fn. 6).

¹⁸ The scope of the EH extends beyond the use of plurals in L2 production.

¹⁹ I will discuss the issue of L1 effects more fully in section 4.2.3.

redundant in semantic terms and is omitted as a result.²⁰ Unlike the EH, the PH applies in a scenario in which the speaker has sufficient planning time.²¹ Under these conditions, the semantic plurality inherent in the concording element has the effect of alerting the speaker to the same attribute in the noun that follows,²² causing plural suppliance to increase rather than decrease.

4.2.2 Summaries of key studies

Young (1988) tested the EH using a group of 12 Mandarin speakers of English, six at low proficiency and six at high proficiency based on TOEFL scores.²³ The data for the study was collected from each learner via two interviews lasting around one hour each. Young reports his results in the form of factor probabilities;²⁴ these findings are shown in table 4.2 (adapted from Young, 1988, p. 293).

type of QP	concording element	proficiency group	
		low	high
concorded	numeral	.70	.61
	plural demonstrative	.50	.67
	quantifier	.45	.49
	partitive ²⁵	.45	.38
Bare		.39	.35

Table 4.2: Suppliance of plurals in concorded and bare QPs (Young, 1988)

Notice that, for each proficiency group, plurals were supplied more often in concorded than bare QPs.²⁶ This result was unexpected under the EH.

²⁰ Although he does not spell this out, Littlewood's examples suggest that if the learner is faced with the choice of omitting either a lexical item or an associated functional morpheme as redundant, he will omit the latter. This is consistent with VanPatten's (1996, p. 18) claim that L2ers process content words in the input before "anything else".

²¹ Admittedly, there might be some subjectivity involved in deciding if a particular task is oriented towards promoting the effects of either efficiency or priming. In the current chapter, we will only consider tasks whose effects are relatively easy to anticipate in this regard.

²² Note that the relative ordering of concording item and plural noun in the QP is not explicitly factored into the EH. Even so, I assume that if efficiency is to have an effect on plural production, the concording item must precede the noun.

²³ These scores placed the high-proficiency group in the intermediate-to-advanced range, while the low-proficiency group were in the elementary range.

²⁴ A value ranging from 0.0 to .49 is evidence of an inhibiting effect, while a value from .51 to 1.0 signifies a promoting effect. A probability of .50 means that the factor has no effect. For the sake of consistency with the other results reported in this thesis, I will interpret these probabilities simply as indicators of relative rates of plural suppliance.

²⁵ On balance, it seems advisable to exclude Young's results for partitives from this discussion, as only 11 QPs containing this type of item occurred in his data.

²⁶ Young also examines aspects of plural production which are not covered in experiment 3. To save space, I will not discuss these here.

Young speculates that the lack of support for the EH in this study might have been due, at least to some extent, to syntactic and/or phonological transfer. He asserts that plurality is not robustly signaled in Mandarin, claiming that this happens on personal pronouns and vocatives only. He also notes that the plural ‘-s’ in English occurs syllable-finally, and that consonants tend not to occur in this position in Mandarin.²⁷ Young suggests that, for these two reasons, learners from this language background fail to treat this inflection as a meaning-bearing element; consequently, there can be no tendency for the plural morpheme to be omitted for the sake of communicative efficiency.

To explore this possibility further, Young (1993) conducted a follow-up study with a group of Czech/Slovak speakers of English: unlike Mandarin, Czech and Slovak are both rich in noun inflection (including plural marking), plus they allow syllable-final consonants. Given these cross-linguistic differences, Young predicted first of all that, regardless of QP type, the Czech/Slovak speakers would mark plurals on nouns at a higher rate than the Mandarin speakers of English had done in his earlier study. A second prediction was that, in keeping with the EH, the Czech/Slovak speakers would omit plurals in concorded QPs more often than in bare ones. This prediction rested on the following related pair of assumptions: because Czech/Slovak marks plurality overtly, Czech/Slovak speakers will notice plural inflection in English more readily than Mandarin speakers; in turn, they will ‘know’ better than Mandarin speakers what can be omitted in plural nouns in English.

Young tested these predictions using 19 university students taking courses in English. Based on their TOEFL scores, he selected the six participants with the highest scores and the six with the lowest scores, forming a high-proficiency group and a low-proficiency group respectively.²⁸ The data was collected from interviews lasting 45 minutes each. Although the results for the Czech/Slovak group confirmed Young’s first prediction that, on the whole, this group would produce plurals more accurately than the Mandarin group, these results disconfirmed the second prediction. Specifically, contra the EH, there was no association between plural omission on one hand and QP type (concorded vs. bare) on the other in the Czech/Slovak data.

²⁷ Mandarin only allows [n] or [ŋ] to occur in this position (Duanmu, 2000, p. 26).

²⁸ Like those of the Mandarin speakers in Young (1988), the TOEFL scores for the Czech/Slovak speakers put the high-proficiency group in the intermediate-to-advanced range, while the low-proficiency group were in the elementary range.

Mellow and Cumming (1994) were primarily interested in testing the PH, though the EH was also considered.^{29,30} Two groups of adult learners of English participated in the study: 24 French speakers and 42 Japanese speakers. The French speakers were enrolled in university-entry ESL courses, and were rated at two levels of proficiency based on their performance on three closely-correlated measures: scores on an interview test, class placements, and length of residence in the country of testing (i.e., Canada). There were 11 intermediate-level speakers and 13 advanced-level French speakers in all. Three samples of each speaker's writing were collected: an informal letter, a summary of an existing text, and an argument-type text. Like the French speakers, the Japanese speakers were ESL students. Based on their TOEFL scores, Mellow and Cumming divided them into two equal-sized groups: high-proficiency (range: 473 to 577; mean: 512.8) and low-proficiency (range: 407 to 470; mean: 438.4).³¹ Each member of this group provided one writing sample: an essay of around 300 words.

Mellow and Cumming compared plural suppliance in two types of QP: concorded and bare.³² They made two alternative predictions: the suppliance of plural inflection would be either lower (in line with the EH) or higher (in line with the PH) in concorded than bare QPs. The results of the study are given in table 4.3 (adapted from Mellow & Cumming, 1994, p. 462).

²⁹ Mellow and Cumming also tested an efficiency-based theory of plural omission due to VanPatten (1996). While Littlewood (1981) attributes morphological omission to semantic redundancy, VanPatten traces this phenomenon to the more fundamental distinction between lexical and grammatical items (cf. fn. 19). Another difference between the two theories is that VanPatten's interpretation of the EH relates to comprehension rather than production. Given that the predictions of his theory for plural production are not significantly from those of Littlewood, I will not devote any more space to VanPatten's proposal here.

³⁰ Since they gathered their data under conditions which were expected to favour priming rather than efficiency, one could question why Mellow and Cumming tested the EH along with the PH in their study.

³¹ For the high-proficiency participants, this range of values suggests that they were at intermediate-to-advanced level, while their mean score was at upper-intermediate level. The low-proficiency participants were at (upper-)elementary-to-intermediate level, with a mean value at (upper-)elementary level.

³² Though Mellow and Cumming report that the concording elements in their data were numerals, plural demonstratives, quantifiers and partitives, they do not draw any distinctions among these types of item.

L1 group	proficiency group	task	suppliance (%)	
			concorded QPs	bare QPs
French	intermediate	letter	73.0	74.9
		argument	87.0	61.6
		summary	69.0	56.2
	advanced	letter	100.0	70.6
		argument	85.4	72.5
		summary	79.7	75.0
Japanese	low	essay	87.7	66.3
	high		80.1	75.7

Table 4.3: Suppliance (%) of plurals in concorded and bare QPs (Mellow & Cumming, 1994)

Mellow and Cumming found that, apart from the result for the intermediate French participants on the letter task, the suppliance of plural inflection was statistically higher for concorded plurals than for bare ones in each experimental condition. On the whole, then, the PH was supported in this study.

Maas (1996) tested the EH by examining the production of plurals in a group of 36 Cuban learners of English. All of the learners had been born in Cuba, and all had been living in the Greater Miami area for at least five years at the time of testing.³³ The data was collected by means of interviews on a range of topics, each lasting 30-40 minutes. The mean suppliance rate for plurals in each type of QP is shown in table 4.4 (adapted from Maas, 1996, p. 203).

type of QP	concording element	suppliance (%)
concorded	numeral	70
	plural demonstrative	79
	quantifier/partitive	69
bare		79

Table 4.4: Suppliance (%) of plurals in concorded and bare QPs (Maas, 1996)

Apart from the result for plural demonstratives,³⁴ Maas's findings indicated that plural suppliance was lower in concorded QPs containing numerals or quantifiers/partitives than in bare QPs. Hence, the overall results were consistent with the EH.

³³ Maas does not provide information about their English proficiency levels.

³⁴ Notice that, contra the EH, plurals were supplied at the same rate in DPs containing plural demonstratives as in bare nominals in this study. The researcher himself ascribes this result to the fact that, in many instances, it was difficult to be sure if the learner was saying 'these' or 'this' in a QP of this kind. (Presumably, this is because Spanish does not have a tense/lax or short/long contrast for vowels, and/or because voicing is not contrastive in fricatives in this language.) In response, Maas elected to

McIlwain and Peterson (2005) looked at the production of plurals by French and Polish speakers of English. Although their study did not set out to test the EH, they attempted to interpret their results in light of this hypothesis post hoc. The data for the study came from the Newcastle Corpus of Learner English, which consists of transcripts of naturalistic conversations lasting around 45 minutes each. The conversations were audio-recorded at intervals of about two to three months over 12 to 15 months. There were three speakers in each L1 group. The French group consisted of C and M, who are described as speaking a ‘post-basic’ variety of learner English, plus H, an advanced speaker. In the Polish group, McIlwain and Peterson classify W and I as “post-basic” speakers, while E speaks a “basic” variety.³⁵

Although McIlwain and Peterson examined QPs containing a variety of determiner types (including ‘some’, which is relevant to experiment 3), they paid special attention to two types of QP: concorded with a numeral, and bare. In table 4.5, I show how accurately each participant supplied plurals in these contrasting contexts (table adapted from McIlwain & Peterson, 2005, p. 5).

group	participant	suppliance (%)	
		concorded QPs	bare QPs
French	C	67	29
	M	84	43
	H	87	76
Polish	E	44	38
	W	95	72
	I	86	71

Table 4.5: Suppliance (%) of plurals in concorded and bare QPs (McIlwain & Peterson, 2005)

The authors observe that their results cannot be explained in terms of “functional load” (p. 7) (sc. the EH) since, in keeping with the PH instead, the rate at which plurals were supplied was higher rather than lower when the QP contained a numeral than when it was bare.

include only those cases in which he was certain that the learner was using the plural demonstrative. But this meant that, for QPs containing this type of concording item, he ended up using data from relatively proficient members of the participant group only. In turn, Maas suspects that this had the effect of boosting the rate of plural suppliance in concorded QPs containing plural demonstratives. On these grounds, I will exclude this particular finding of Maas’s study from consideration for the rest of this review.

³⁵ I tentatively assume that “basic” roughly corresponds to (upper-)elementary level while “post-basic” is in the intermediate range.

Though neither Dao (2007) nor Bruhn de Garavito (2008) set out to test either the EH or the PH, I have included both studies in this review. As we shall see, the results of each can be used to test both theories of variability. Each study was conducted in the spoken modality, and compared the suppliance of plurals in two types of QP: concorded with a numeral, and bare.

Dao (2007) focused on the use of plurals by Vietnamese learners of English. There were 36 participants, all aged between 13 and 18; these were secondary-school students taking EFL classes.³⁶ The data was elicited via a picture-description task. I submitted Dao's data to parametric and robust paired-samples *t*-tests; the output is given in table 4.6. As predicted by the PH, plural suppliance was higher in concorded than bare QPs.

mean (SD)		test type						effect size (<i>d</i>)	pwr.
concorded	bare	parametric			robust				
		<i>t</i>	sig.	95% CI	<i>t</i>	sig.	95% CI		
.50 (.35)	.38 (.31)	2.44	.02	.02, .22	1.91	.08	0, .19	.36	.56

Table 4.6: Suppliance of plurals in concorded and bare QPs: statistical analysis (Dao, 2007)

The non-statistical finding in the robust test was attributable to a lack of power (N=63).

Bruhn de Garavito (2008) investigated the production of plural inflection in Spanish by French learners. The study focused on two groups of high-school students acquiring Spanish in a classroom setting: 30 with a mean age of 15, and 12 with a mean age of 16.3. Bruhn de Garavito classified the former group as low-proficiency and the latter as lower-intermediate, though their L2 proficiency was not measured directly. A picture-description task was used to collect naturalistic data. Bruhn de Garavito found that each group omitted plurals more often in concorded QPs than in bare ones, but that the difference was statistical only for the low-proficiency group. In sum, the results of her study were consistent with the EH.

4.2.3 Limitations of previous research

The studies reviewed in section 4.2.2 were quite diverse in certain respects. To facilitate comparison, I list their main features in table 4.7. Note that L2 proficiency (where

³⁶ No information is provided about their English proficiency levels.

information about this is available) does not seem to have played a significant role in the outcome of any of these studies; for example, in Young (1988), priming effects were observed in the advanced as well as the intermediate data. In this light, I will not mention this attribute again in the current section.

study	L1/L2	orientation of task	plural marking in L1?	observed effect	type(s) of concording element
Young (1988)	Mandarin/English	efficiency (i.e., interview)	no	priming	numerals / plural
Young (1993)	Czech/Slovak / English	efficiency (i.e., interview)	yes	no effect	demonstratives / quantifiers
Mellow and Cumming (1994)	(i) French/English (ii) Japanese/English	priming (i.e., written composition)	(i) yes (ii) no	priming	unspecified
Maas (1996)	Spanish/English	efficiency (i.e., interview)	yes	efficiency	numerals / quantifiers / partitives
McIlwain and Peterson (2005)	(i) French/English (ii) Polish/English	efficiency (i.e., interview)	(i) yes (ii) yes	priming	numerals
Dao (2007)	Vietnamese/English	efficiency (i.e., picture description)	no	priming	numerals
Bruhn de Garavito (2008)	French/Spanish	efficiency (i.e., picture description)	yes	efficiency	numerals

Table 4.7: Overview of studies testing the Efficiency Hypothesis and/or the Priming Hypothesis

On the whole, the studies yielded mixed results. To start with, apart from Mellow and Cumming (1994), all of them employed tasks which might have been expected to promote the effects of communicative efficiency rather than priming; yet these effects were only observed in Maas (1996) and Bruhn de Garavito (2008). In all but one of the remaining efficiency-oriented studies, the results supported the PH instead; the exception was Young (1993), where no effect consistent with either hypothesis was detected.

Some clarity can perhaps be brought to this situation by examining whether or not the L1 has inflection for plurality. First of all, the results of Young (1988) and Dao (2007) suggest that when an efficiency-oriented task is used plus the L1 is plural-less, the suppliance of this morpheme will be primed by the concord element. Note also that, from a contrastive standpoint, there are no studies in which the L1 *lacks* plural marking but efficiency is the observed effect instead.

However, this explanation has its drawbacks. Recall that Young (1988) focused on two groups of only six learners each; this small sample-size inevitably colours our interpretation of the results of the study. Another issue which crops up in Young's earlier experiment is that, as he himself acknowledges, the suppliance of plurals after numerals was likely boosted by a preponderance of expressions based on 'measure words' (e.g., 'day') within this set of data. Instances of measure expressions (in italics) are given in (9) (examples from Young, 1993, p. 82).³⁷

- (9) (a) I stay Boston only five da- *five days*.
 (b) pay rent . is , each month *seven . seven hundred fifty dollars*.
 (c) *Ten years* ago . house very low cheap.

Young assumes that these expressions occur relatively frequently in the input that the learner receives; hence, plurals will be supplied relatively accurately in these expressions.³⁸

Second, when an efficiency-oriented task is used plus the L1 is *not* plural-less, I suggest that we will see efficiency. This conclusion is based on the results of Maas (1996) and Bruhn de Garavito (2008). Note in particular that sample size is not a concern in either of these studies. However, neither Young (1993) nor McIlwain and Peterson (2005) fits this pattern. As mentioned earlier, there was no effect of either efficiency or priming in the former study while, in the latter, the results were in keeping with the PH.

Then again, both of these studies have certain undeniable limitations which lessen the threat that their findings pose to my suggestion. To start with, sample size was small in each case. Young divided his pool of Czech/Slovak learners into two groups of six learners each (as he did in his earlier study on Mandarin learners), while McIlwain and Peterson investigated two L1 groups consisting of only three participants

³⁷ It is worth adding that measure expressions can be based on concurring elements other than numerals, as shown in (i) and (ii).

- (i) *Some nights*, I feel very cold.
 (ii) He works hard *these days*.

Even so, Young seems to make the reasonable assumption that these expressions typically contain numerals. Perhaps this is because measure expressions are more productive with numerals than other concurring items'

³⁸ One cannot tell from Dao's (2007) write-up if measure expressions occurred often in her data as well.

each. Moreover, like Young in his Mandarin study, McIlwain and Peterson attribute the increased suppliance of plurals after numerals in their study to the presence of a disproportionate number of measure words in the data.

We can now evaluate Mellow and Cumming (1994), the only study among those reviewed here in which priming rather than efficiency was the effect predicted at the outset of the study. Mellow and Cumming's findings give the impression that if a priming-oriented task is used, this effect will be observed regardless of whether plurality is marked in the L1 or not. However, one concern related to this study is that the authors used written tasks. On the face of it, this modality seems appropriate for testing the PH, insofar as it does not place the learner under heavy communicative pressure. However, as mentioned in section 2.1.3, the downside of using a written instrument is that it might be expected to allow the learner to access his metalinguistic knowledge relatively freely. If so, it is quite possible that the priming effect Mellow and Cumming claimed to have identified was confounded by the involvement of this type of knowledge. In this light, I take the view that a spoken task might be better suited to testing the PH than the type of instrument employed by Mellow and Cumming, provided it is not too onerous in cognitive terms.

To recap, the studies reviewed in this section suggest that if the L1 is plural-less, we will see a priming effect regardless of which type of task is used. In the current experiment, I follow up on one of the research implications of this conclusion; specifically, I test the PH against the spoken production of a plural-less L1 group (i.e., Korean learners) using a priming-oriented task.³⁹

In addition, experiment 3 extends existing work on this topic in two crucial directions. First, I focus on a particular characteristic of the structure of concorded QPs that has not received attention in previous work in this area: the distance between the concord element and the plural noun. To my knowledge, evidence for the effects of distance on the processing of agreement by L2ers has come only from research in the verbal domain (e.g., Bannai, 2011; Hawkins, R., & Casillas, 2008). For instance, Hawkins and Casillas compared the spoken production of this type of inflection when the subject and verb are adjacent, as in (10a), and when they are separated by one or

³⁹ One could object that the experimental task used in the present thesis is not a typical priming-oriented task; in particular, the SR phase could be viewed as quite demanding in cognitive terms. My position is that the current task is better classified as priming- than efficiency-oriented on the grounds that it does not include an element of spontaneity (cf. an interview task, for instance).

more (filled) terminal nodes (i.e., words),⁴⁰ as in (10b) (examples from p. 11; my emphasis).

- (10) (a) My brother owns a house.
 (b) The brother *of my best friend* owns a house.

The researchers used a sentence-completion task to analyse the spoken production of Mandarin and Spanish learners at lower-intermediate proficiency.⁴¹ The findings indicated that, for each of these L1 groups, agreement was supplied less accurately in the separated condition than the adjacent one. In the present study, I aim to determine if the same type of asymmetry might also manifest itself in the nominal domain.

The second way in which experiment 3 builds on previous research is by distinguishing between quantifiers rather than lumping these together into a single class (cf. Maas, 1996; Young, 1988). As we saw in 4.2 earlier, Young (1988) reported distinct rates of plural suppliance for QPs containing numerals, plural demonstratives and quantifiers. The present study takes this process of differentiation one step further by exploring the possibility that, within the quantifier class itself, different items might be associated with different rates of plural suppliance. I do this by comparing plural suppliance after numerals and the quantifier ‘some’ only. My justification for singling out ‘some’ within this class of concording element is that, as argued in section 4.1.1, this quantifier is less strongly associated with plurality on a semantic level than a numeral is.

Under the PH, certain asymmetries in plural omission rates are anticipated for the structures under investigation in this experiment.⁴² These are stated in (11).⁴³ For the sake of conciseness, I have expressed each of these asymmetries in the form of an inequality. Thus, (11a), for instance, means that the rate of plural omission in an N-pl QP (e.g., ‘five dogs’) is predicted to be higher than in a ‘some’ + N-pl QP (see also table 4.1).

⁴⁰ Compare this interpretation of linear distance with Gibson’s (2000) more stringent method of counting discourse referents only (see section 4.1.2).

⁴¹ Hawkins and Casillas adopt the view that, for early L2ers, this asymmetry is not dependent on the presence or absence of agreement inflection in the L1.

⁴² Although the character of the PH is such that it pertains more naturally to the *suppliance* rather than the omission of plural inflection, the predictions which follow are couched in terms of inflectional omission. This is intended to bring the focus of experiment 3 into line with those of experiments 1 and 2.

⁴³ This list of predictions is missing one logically possible comparison: ‘some’ + N-pl vs. Numl + Adj + Adj + N-pl QPs. I believe it is difficult to formulate a principled prediction in either direction in this case.

- (11) (a) N-pl > ‘some’ + N-pl
 (b) N-pl > Numl + Adj + Adj + N-pl
 (c) N-pl > Numl + N-pl
 (d) ‘some’ + N-pl > Numl + N-pl
 (e) Numl + Adj + Adj + N-pl > Numl + N-pl

The cline shown in (12) captures the full set of asymmetries in (11). In this set of inequalities, the symbol ‘ $\not>$ ’ indicates that I am not able to make a prediction about the direction of the difference between the two rates on either side of the symbol.

- (12) N-pl > ‘some’ + N-pl $\not>$ Numl + Adj + Adj + N-pl > Numl + N-pl

4.3 Methodology

I used the same participants and materials and, for the most part, the same procedure in experiment 3 that was used in experiments 1 (see section 2.2) and 2 (see section 3.4). In the present section, I will focus on aspects of the methodology that are specific to experiment 3. The types of stimulus used in this study were listed in table 4.1 (repeated below as table 4.8).

type of QP	structure of QP	example
concorded	Numl + N-pl	five dogs
	Numl + Adj + Adj + N-pl	five hungry white dogs
	‘some’ + N-pl	some dogs
bare	N-pl	dogs

Table 4.8: Types of QP investigated in experiment 3

I will now deal mainly with the selection and location of the tokens of each of these QP types. Their important characteristics are listed below.

- (i) There were seven of each type of stimulus QP.⁴⁴

⁴⁴ Recall from section 3.4 that the plural stimuli in experiment 2 all occurred in Numl + N-pl contexts. Six of these eight plural stimuli (randomly selected) were re-used in the present experiment.

- (ii) All of the stimulus nouns were short-stemmed regulars. As we saw in section 3.2.2, plurals can be supplied at different rates on short and long stems in early interlanguage if the L1 lacks the PWD-adjunction structure necessary for prosodifying regular inflection in target-like fashion in English (Goad, White & Steele, 2003). I demonstrated in section 3.1.2.3 that this prosodic structure is not found in Korean.
- (iii) Each of the stimulus nouns was countable.
- (iv) As I pointed out in section 3.1.1, plural marking in Korean is only needed for two purposes: to express a plural-demonstrative meaning, or to foreground the plurality of the referent for discourse reasons. None of the stimuli in experiment 3 was located in either of these types of context.
- (v) The intervening adjectives in the Num1 + Adj + Adj + N-pl stimuli were high-frequency words. The companion website for Leech, Rayson and Wilson (2001) was used for checking these frequencies.
- (vi) For the sake of consistency, the lengths of these adjectives were controlled such that a disyllabic adjective always preceded a monosyllabic adjective (e.g., ‘seven hungry green frogs’).
- (vii) Each stimulus QP occurred before a word beginning with either [f] or [v] in order to block resyllabification of inflection as a syllable onset (Goad et al., 2003).

The complete set of stimuli is shown in table 4.9.

type of QP	stimulus QP	reference
Numl + N-pl	three locks	3.2
	seven ducks	3.4
	five crabs	4.4
	nine hens	5.4
	eight bells	14.4
	four pens	21.2
	two cups	26.3
Numl + Adj + Adj + N-pl	eight fancy new zips	2.3
	nine heavy brown logs	12.5
	six scary long guns	13.3
	two happy young vets	15.4
	ten tiny white buns	17.2
	seven hungry green frogs	26.7
	five dusty thick maps	27.2
'some' + N-pl	some cans	2.4
	some mops	3.3
	some pigs	5.5
	some socks	7.4
	some sacks	20.7
	some bags	21.1
	some pups	24.5
N-pl	kids	7.6
	hats	8.5
	frocks	8.5
	nuts	11.2
	plums	12.2
	flags	16.1
	wigs	26.2

Table 4.9: Stimuli for experiment 3

4.4 Results

As there were no cases of plural omission for the native-speaker group, I will present the results for the Korean learners only (see appendix 4.1 for the relevant data-sets). We now turn our attention to the prediction of the current experiment. I show the predicted pattern in (13a) (= 12, repeated for convenience); the results are summarised in (13b) to (13d) (EI = elicited imitation; SR = story recall).

- (13) (a) predicted:
 $N\text{-pl} > \text{'some'} + N\text{-pl} \not> \text{Numl} + \text{Adj} + \text{Adj} + N\text{-pl} > \text{Numl} + N\text{-pl}$
- (b) intermediate:
 $\text{Numl} + \text{Adj} + \text{Adj} + N\text{-pl} > N\text{-pl} > \text{'some'} + N\text{-pl} > \text{Numl} + N\text{-pl}$
- (c) advanced (EI):
 $N\text{-pl} = \text{'some'} + N\text{-pl} > \text{Numl} + \text{Adj} + \text{Adj} + N\text{-pl} > \text{Numl} + N\text{-pl}$
- (d) advanced (SR):
 $N\text{-pl} > \text{Numl} + \text{Adj} + \text{Adj} + N\text{-pl} > \text{'some'} + N\text{-pl} > \text{Numl} + N\text{-pl}$

On the whole, the results of this experiment were in keeping with the PH. Note also that I am drawing this conclusion even though, as we shall see shortly, some of the comparisons involved in testing the prediction of this study were not statistical. My rationale for interpreting the results along these lines is that most of these non-statistical results were due to a lack of power. While this sort of deficit cannot, of course, turn a non-statistical finding into a statistical one, it nonetheless mitigates a non-statistical finding at least to a degree.

Two other features of the results for the intermediate group must be mentioned. The more important of these is that, against the prediction in (13a), the rate of plural omission was *lower* in N-pl than Numl + Adj + Adj + N-pl QPs.

The omission rates in the contexts of interest are given for the intermediate KLEs in figure 4.1.

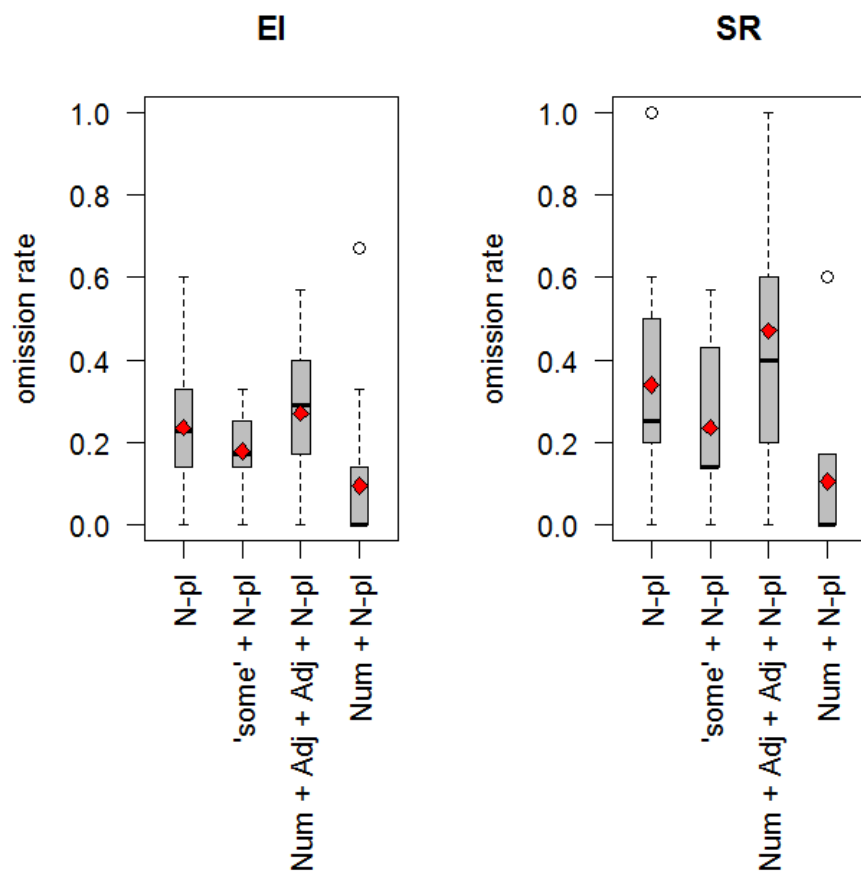


Figure 4.1: Omission of plural inflection: intermediate group

The advanced data follows in fig. 4.2.

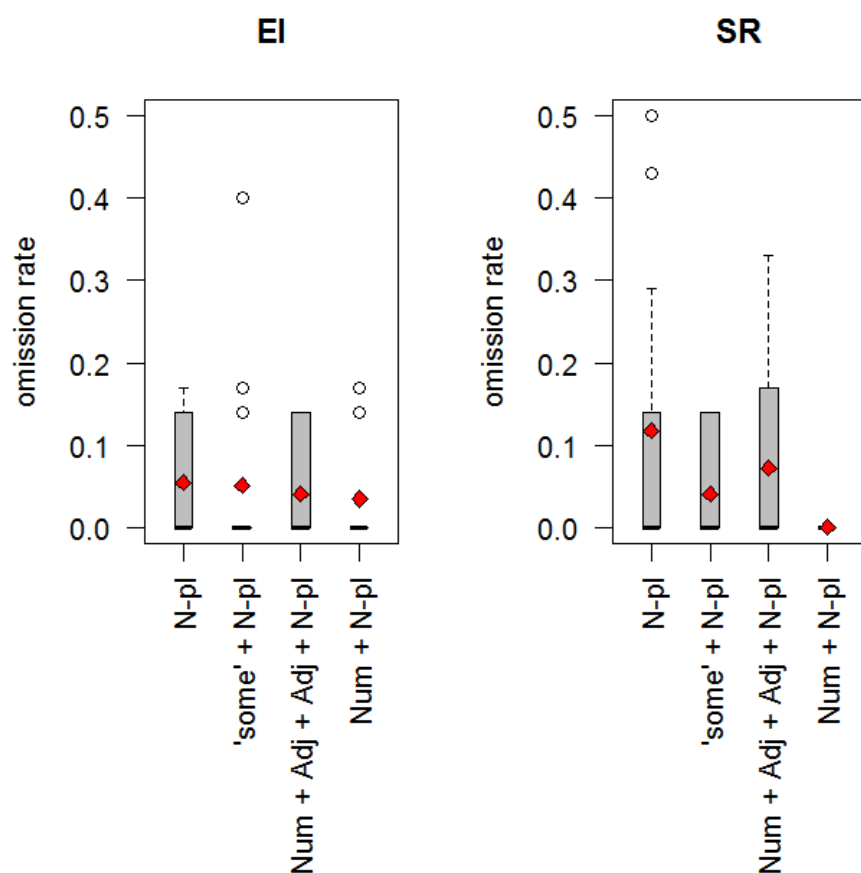


Figure 4.2: Omission of plural inflection: advanced group

I will start by testing the sub-prediction that plurals will be omitted more frequently in N-pl than 'some' + N-pl QPs. I give the output of the analysis in table 4.10.

group	phase	mean (SD)		test type						effect size (<i>d</i>)	pwr.
		N-pl	'some' + N-pl	parametric			robust				
				<i>t</i>	sig.	95% CI	<i>t</i>	sig.	95% CI		
interm.	EI	.24 (.19)	.18 (.12)	1.06	.31	-.06, .17	1.29	.22	-.05, .16	.36	.24
	SR	.34 (.33)	.23 (.17)	1.01	.33	-.12, .33	.24	.81	-.11, .31	.40	.28
adv.	EI	.05 (.08)	.05 (.12)	.12	.91	-.06, .07	.56	.58	-.05, .06	.04	.05
	SR	.12 (.17)	.04 (.07)	1.42	.18	-.04, .19	.95	.36	-.04, .17	.59	.53

Table 4.10: Omission of plural inflection in N-pl and 'some' + N-pl QPs: statistical analysis

For each group, the difference was not statistical in either phase for each type of test. However, for the intermediate group, the non-statistical result obtained in each phase

was attributable to a lack of power (EI: N=63; SR: N=52). This was true of the non-statistical result obtained in the SR phase for the advanced group as well (N=25).

The next sub-prediction is that plural omission will be more frequent for plurals in N-pl than Numl + Adj + Adj + N-pl QPs. The output of the analysis is presented in table 4.11.

group	phase	mean (SD)		test type						effect size (<i>d</i>)	pwr.
		N-pl	Numl... N-pl	parametric			robust				
				<i>t</i>	sig.	95% CI	<i>t</i>	sig.	95% CI		
interm.	EI	.24 (.19)	.27 (.17)	-.80	.44	-.13, .06	-.78	.45	-.13, .06	-.19	.10
	SR	.34 (.33)	.47 (.32)	-1.14	.28	-.38, .12	1.06	.31	-.38, .13	-.41	.30
adv.	EI	.05 (.08)	.04 (.07)	.57	.58	-.04, .07	.44	.66	-.03, .07	.20	.11
	SR	.12 (.17)	.07 (.11)	.85	.41	-.07, .16	.42	.68	-.09, .15	.31	.19

Table 4.11: Omission of plural inflection in N-pl and Numl + Adj + Adj + N-pl QPs: statistical analysis

For each group, the difference was not statistical in either phase for each type of test. However, the non-statistical result obtained in the SR phase for each group was attributable to a lack of power (intermediate: N=49; advanced: N=84).

The sub-prediction that plurals will be omitted more often in N-pl than Numl + N-pl QPs will now be tested. The output of the analysis is shown in table 4.12.

group	phase	mean (SD)		test type						effect size (<i>d</i>)	pwr.
		N-pl	Numl + N-pl	parametric			robust				
				<i>t</i>	sig.	95% CI	<i>t</i>	sig.	95% CI		
interm.	EI	.24 (.19)	.09 (.19)	2.49	.03	.02, .26	2.55	.02	.02, .25	.74	.73
	SR	.34 (.33)	.10 (.17)	2.42	.03	.02, .45	3.13	.008	.04, .44	.91	.88
adv.	EI	.05 (.08)	.03 (.07)	.88	.39	-.03, .07	.41	.69	-.02, .07	.27	.16
	SR	.12 (.17)	0 (0)	2.54	.02	.02, .22	2.58	.02	.01, .19	.96	.91

Table 4.12: Omission of plural inflection in N-pl and Numl + N-pl QPs: statistical analysis

In accordance with Benjamini and Hochberg's (1995) False Detection Rate (FDR), the alpha value was adjusted to .03. For the intermediate group, the difference was statistical in each phase of the task for each test type. For the advanced group, the difference was statistical in the SR phase, but not in the EI phase.

We will now move on to the sub-prediction that the omission rate will be higher for plurals in ‘some’ + N-pl than Numl + N-pl QPs. I show the output of the analysis in 4.13.

group	phase	mean (SD)		test type						effect size (<i>d</i>)	pwr.
		‘some’ + N-pl	Numl + N-pl	parametric			robust				
				<i>t</i>	sig.	95% CI	<i>t</i>	sig.	95% CI		
interm.	EI	.18 (.12)	.09 (.19)	1.76	.10	-.02, .19	2.08	.058	-.002, .19	.53	.45
	SR	.23 (.17)	.10 (.17)	2.87	.01	.03, .23	3.16	.008	.04, .22	.77	.76
adv.	EI	.05 (.12)	.03 (.07)	.58	.57	-.04, .08	.42	.68	-.03, .07	.17	.09
	SR	.04 (.07)	0 (0)	2.28	.04	0, .08	1.40	.18	0, .07	.86	.84

Table 4.13: Omission of plural inflection in ‘some’ + N-pl and Numl + N-pl QPs: statistical analysis

In accordance with the FDR, the alpha value was adjusted to .01. For the intermediate group, the difference was statistical in the SR phase, but not in the EI phase. For the advanced group, the difference was not statistical in either phase for each type of test. However, for the intermediate group, the non-statistical result obtained in the EI phase was attributable to a lack of power (N=45). The same was true of the non-statistical result obtained in the SR phase for the advanced group (N=20).

Finally, I will test the sub-prediction that the omission rate will be higher in Numl + Adj + Adj + N-pl than Numl + N-pl QPs. I give the output of the analysis in : 4.14.

group	ph.	mean (SD)		test type						effect size (<i>d</i>)	pwr.
		Num... N-pl	Numl + N-pl	parametric			robust				
				<i>t</i>	sig.	95% CI	<i>t</i>	sig.	95% CI		
interm.	EI	.27 (.17)	.09 (.19)	2.85	.01	.04, .31	3.49	.004	.05, .31	.97	.92
	SR	.47 (.32)	.10 (.17)	4.52	.0006	.19, .54	-	0	.21, .53	1.44	1.0
adv.	EI	.04 (.07)	.03 (.07)	.53	.60	-.02, .03	.32	.76	-.01, .01	.09	.06
	SR	.07 (.11)	0 (0)	2.50	.03	.01, .13	2.06	.06	0, .12	.94	.90

Table 4.14: Omission of plural inflection in Numl + Adj + Adj + N-pl and Numl + N-pl QPs: statistical analysis

In accordance with the FDR, the alpha value was adjusted to .03. For the intermediate group, the difference was statistical in each phase of the task. For the advanced group, the difference was statistical in the SR phase of the task using the parametric test, but

not using the robust test. However, I suggest that the robust-test result can be overlooked; in particular, notice that the effect size for this comparison was high.⁴⁵

4.5 Discussion

In experiment 3, I tested the prediction of the PH shown in (14) (= 13a, repeated for convenience).

$$(14) \quad \text{N-pl} > \text{'some' + N-pl} \not\approx \text{Numl + Adj + Adj + N-pl} > \text{Numl + N-pl}$$

My conclusion was that the PH was broadly confirmed. I also noted, however, that the results obtained for some of the comparisons implied by (14) were non-statistical due to a lack of power. Although this feature of a given comparison goes some way towards mitigating a non-statistical result, repeated allusions to a lack of power are bound to create a rather deflating impression. To alleviate this problem, logistic considerations permitting, it would be worth replicating each of the affected comparisons with a larger group of participants.

It is also important to discuss one striking deviation from the cline in (14): for the intermediate group, plural omission was *less* frequent for N-pl than Numl + Adj + Adj + N-pl QPs. A possible explanation for this result is that, in general, the priming effect created by a numeral in the Numl + Adj + Adj + N-pl QP can be ‘overwhelmed’ by a stronger effect in the opposite direction. As mentioned in fn. 19, VanPatten (1996, p. 18) suggests that L2ers process content words in the input before functional morphemes.⁴⁶ It follows that content words will be privileged over functional morphemes when cognitive resources are allocated within a given QP. Thus, in addition to a priming effect whose strength depends on the type of concord element plus its distance from the noun, I propose, after VanPatten, that a concord QPs is subject to a ‘resource-depletion’ effect whose strength depends only on the number of content words which occur inside this QP (including the concord element itself).

If this proposal is correct, we have an explanation for the result in question. But note that the resource-depletion effect was apparently stronger than the priming effect only in the intermediate data, as the advanced data exhibited the opposite (and

⁴⁵ The non-statistical result for the robust test was not attributable to a lack of power, so it cannot be excused on this basis.

⁴⁶ Given that VanPatten does not specify if the characteristics of the L1 are relevant in this respect, I take it that they are not.

also predicted) weighting of effects. This divergence in the behaviour of these two groups can only be attributed to their difference in L2 proficiency. Presumably, the resource-depletion effect was weaker for the advanced participants because these learners had a more robust representation of plural inflection in their interlanguage grammars than their intermediate counterparts. The relationship between the resource-depletion effect and L2 proficiency is another topic that might repay further investigation.

Before I conclude this chapter, a quick note on animacy effects is called for (see section 3.1.1). Recall Suh's (2008, p. 246) finding that, despite claims in the literature that the use of plural marking depends on the animacy of the referent (Song, 2005, p. 71), the native Korean speakers in her study did not use the plural-marker *-tul* at significantly different rates with animal and inanimate referents. The findings of experiment 3 echo those of Suh's study. For example, plurals were marked in the QP 'two happy young vets' at *lower* than the mean frequency for these seven stimuli (0.57 cf. 0.61): if the putative animacy effects associated with Korean plural-marking had been strong enough to influence the data appreciably via L1 transfer, one might have expected the frequency for this QP to be *higher* instead.

4.6 Chapter conclusion

The experiment reported in this chapter examined priming effects in the omission of plurals in concorded vs. bare QPs by KLEs. The structure of the concorded QPs varied along two orthogonal dimensions: the distance between the concording element and the noun, and the type of element used. On the whole, the predictions of the PH were supported, though I also flagged the need to replicate some of these comparisons with larger groups of participants in order to achieve adequate levels of statistical power. The only unexpected finding of the experiment was that the intermediate group omitted plural inflection at a lower rate in N-pl than in Num1 + Adj + Adj + N-pl QPs. I attributed this result to a resource-depletion effect in concorded QPs, and speculated that the strength of this effect might depend on the proficiency of the learner. Further research is needed on this aspect of plural omission.

I also suggest that the current experiment could be profitably extended in several new directions.

- (i) In section 4.2.3, I proposed that the omission of plurals in concorded and bare QPs depends on two cross-cutting variables: the use of a priming- or efficiency-oriented task, and the presence or absence of plural marking in the L1. Experiment 3 was concerned with one of these four logically-possible pairings; specifically, I employed a priming-oriented task to investigate a group of learners whose L1 lacks overt plural-marking. The effects of task type and L1 background could be explored further by conducting a follow-up study (again using a priming-oriented task) with a learner group whose L1 *has* overt plural-marking. One could then complete the extension of experiment 3 in these two directions by using an *efficiency*-oriented task to investigate learners from both types of L1 background.
- (ii) The number of adjectives that intervene between the concording element and the noun in a concorded QP could be varied. This would enable us to verify that, on a general level, priming effects depend on the actual *distance* between the primer and the target, and not just on the presence of a gap (of indeterminate length) between these two items (cf. Hawkins & Casillas, 2008). On a general level, evidence for a graded effect of linear distance on inflectional suppliance comes from a study such as Grodner and Gibson (2005). Using a self-paced reading task with native English speakers, these researchers compared past-tense production across three structures: adjacent, separated by a PP, or separated by a relative clause which included a PP. I give examples in (15a), (15b) and (15c) respectively (from p. 273; my emphasis).

- (15) (a) The nurse supervised the administrator while ...
 (b) The nurse *from the clinic* supervised the administrator while ...
 (c) The nurse *who was from the clinic* supervised the administrator while ...

Grodner and Gibson found that the difficulty of processing the dependency relation between the head noun (i.e., ‘nurse’) and the verb (i.e., ‘supervised’) varied with the number of discourse referents that intervened between these two items. It remains to be determined if, admittedly under somewhat different conditions, a similar effect is observed in the spoken production of inflection in

general by L2ers in the nominal domain as well.⁴⁷ Note, however, that resource depletion might also have an impact on the suppliance of plural inflection in this situation, so this possibility would need to be taken into account.

- (iii) One could vary the lengths of the intervening adjectives. This would help determine whether the linear distance between the primer and the target is better measured in terms of the number of intervening terminal nodes, or in purely orthographic terms.
- (iv) To explore the role of semantic factors in more depth, plural omission could be compared after different quantifiers (e.g., ‘some’ vs. ‘many’). A potential stumbling block, though, is that we would first need to be able to compare the semantic properties of the quantifiers themselves in a principled way (cf. ‘some’ vs. a numeral in section 4.1.1).
- (v) Depending on the characteristics of the L1 under scrutiny, we could investigate the priming of plural inflection after plural demonstratives. However, one important methodological consideration is that, again subject to L1 effects, some learners might not pronounce ‘these’ and ‘this’ noticeably differently (see fn. 33).

Each of these extensions promises to cast further light on the factors which drive the omission of plural inflection in general.

⁴⁷ I am assuming here that, as a form of inflectional priming, subject-verb agreement is broadly comparable to nominal agreement.

Chapter 5

Conclusion

This thesis has investigated the claim that asymmetries in the production of a given functional morpheme can shed light on the underlying causes of L2 variability. The essential rationale for the thesis was that although such asymmetries have already attracted some attention in the literature, more work in certain specific areas was clearly needed. This was due not only to a relative lack of research activity in the areas in question, but also to concerns over the methodologies adopted in some of the relevant studies. The other distinctive characteristic of this thesis was that Korean learners of English (KLEs) were chosen as the L1 group. This group was deemed suitable because of significant divergences between these two languages in syntactic and prosodic terms. Recall also that I focused on spoken rather than written production. My conclusion is that, all things considered, the findings of this thesis upheld the essential claim that I set out to test.

Three experiments were conducted, each dealing with a different set of asymmetries. Experiment 1 focused on the use of definite articles in first- and second-mention DPs. In (1) and (2) respectively, I exemplify the use of the definite article in these contexts (examples repeated from (1) and (2) in section 2.0).

- (1) I had to get a taxi from the station. On the way *the driver* told me there was a bus strike.
- (2) I saw a cat. I gave *the cat* some milk.

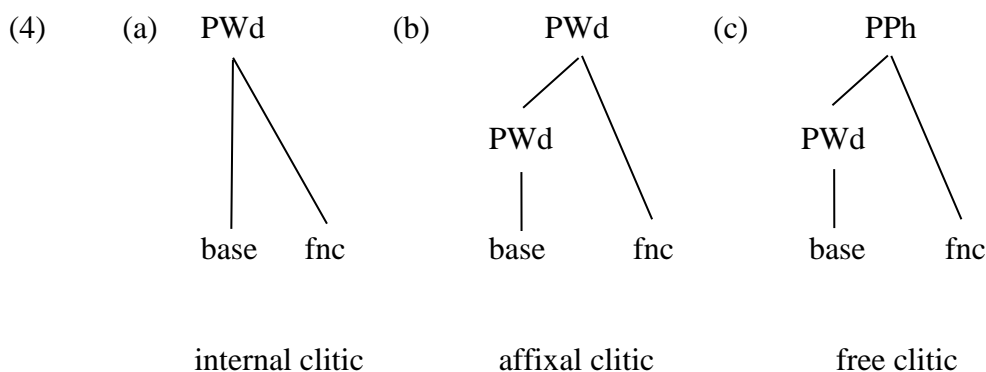
I also show in (3) that Korean lacks an article system of its own (example repeated from (9) in section 2.1.3).

- (3) na-nun ecey tosekwan-eyse chayk-ul pilli-ess-ta.
 I-TOP yesterday library-LOC book-ACC check.out-PST-DECL
 ‘I checked out a/the book (or books) from a/the library (or libraries).’

The predictions for Korean learners were that definite articles would be omitted more frequently in second than first mentions, and substituted less frequently in second than first mentions. The key assumption which underpins both predictions is that learners make non-target links between article form and article meaning. For the first prediction, definite articles in second-mention contexts are assumed to be communicatively redundant as well.

The predictions of this experiment were not supported, as no clear asymmetry in either the omission or substitution of definite articles was evident for either proficiency group. I suggested replicating the experiment with (upper-)elementary participants, a more challenging task, and/or a task not based on narratives. Another change that could be made to the task was specific to the second prediction: rather than retelling an existing story, the participant must create a new one.

In experiment 2, we turned our attention to (past) tense, agreement and plural (TAP) inflection. This experiment hinged on the contrasts in English between short stems (e.g., ‘tap’ [tæp]; rhyme underlined) and long stems (e.g., ‘blink’ [blɪnk]) among regular verbs and nouns, and between regular verbs (e.g., ‘cook’ → ‘cooked’) and irregular verbs (e.g., ‘kneel’ → ‘knelt’). I also assumed a model of prosodic structure wherein lexical words are PWds, but non-lexical material can be organised in various ways. Three such representations were relevant to this experiment: internal clitic (4a), affixal clitic (4b), and free clitic (4c) (examples repeated from (7) in section 3.1.2.2).



In addition, I showed that Korean and English diverge from each other vis-à-vis the types of inflection that occur in both languages, plus the ways in which this inflection is prosodified. This situation is summarised in table 5.1 (repeated from table 3.7 in section 3.1.2.3).

type of morpheme		Korean (L1)	English (L2)
verbal	tense	PWd-internal incorporation	PWd-internal incorp. (irregulars); PWd adjunction (regulars)
	agreement	-	PWd adjunction
nominal	plurals	-	PWd adjunction
	particles (e.g., case markers)	free cliticisation	-

Table 5.1: Prosodic structures for noun and verb morphology in Korean and English

The theory of variability tested in experiment 2 was the Prosodic Transfer Hypothesis (PTH), which essentially states that the prosodification of L2 functional morphology is constrained by the inventory of representations available in the L1. I also proposed that prosodic transfer operates in accordance with the set of assumptions listed in (5) (repeated from (33) in section 3.3).

- (5)
- (a) If more than one L1 prosodic structure is available, the learner will redeploy the L1 structure which is used for the same construction as the one in the L2.
 - (b) If this particular L1 structure is not available, another L1 structure within the same domain (nominal or verbal) will be selected.
 - (c) If no other L1 structure is available in this domain, an L1 structure from a different domain will be used.

Based on the cross-linguistic scenario depicted in table 5.1, the PTH predicted certain asymmetries in the use of TAP morphology by Korean learners. The main prediction for tense and agreement was that, early in development, the KLEs in this experiment would redeploy the prosodic representation for tense inflection in the L1, and omit regular inflection more often on long stems than short stems regulars (because the latter type of inflection could be incorporated within the PWd in non-target fashion). Later on in development, these learners would be able to minimally adapt the target structure (i.e., PWd adjunction) from L1 relations. The prediction for plural inflection was that the

KLEs would redeploy the prosodic representation for particles in Korean, and supply plural inflection at the same rate on regulars in general (since a free clitic can attach equally readily to a long or short stem).

The results of the study only partly confirmed the PTH. Agreement inflection was omitted more frequently on long-stemmed than short-stemmed regulars, as expected, yet this asymmetry was apparent at advanced as well as intermediate level. An even more surprising result was that the same pattern was discernible in the omission of plural inflection despite the fact that the free-clitic structure was available in the L1 within the same domain. I speculated that this might have been because, cross-linguistically, plural morphemes tend not to be prosodified as clitics. The tense results were unexpected as well, since no clear pattern was detectable for either proficiency group. The most plausible explanation seemed to be that the anticipated asymmetry in omission rates had been masked by syntactic transfer from tense inflection in Korean.

Experiment 3 also explored plural use, but from another angle. I focused here on syntactic and semantic contrasts between concorded QPs (e.g., ‘five ducks’) and bare nominals. The specific types of QP relevant to this experiment are shown in table 5.2 (repeated from table 5.2 in section 4.1.1).

type of QP	structure of QP	example
concorded	Numl + N-pl	five dogs
	Numl + Adj + Adj + N-pl	five hungry white dogs
	‘some’ + N-pl	some dogs
bare	N-pl	dogs

Table 5.2: Types of QP investigated in experiment 3

Recall that the structures of the concorded QPs varied along two orthogonal dimensions: the distance between the concording element and the noun, and the type of element used. In particular, I took the position that, in semantic terms, the quantifier ‘some’ is less strongly associated with plurality than a numeral is.

Two theories of variability were relevant to this experiment: the Efficiency Hypothesis (EH), which predicts that inflection will be omitted more often in concorded than bare QPs, and the Priming Hypothesis (PH), which predicts the opposite pattern. Note also that whether we see efficiency or priming in a given scenario is assumed to be conditioned by the type of task used: efficiency if the task is cognitively demanding, but

priming otherwise. I also proposed that if the L1 lacks plurals, we will see priming rather than efficiency regardless of the type of task used.

The specific focus of the experiment was on the differential priming of plural inflection in the contexts shown in table 5.2. In (6), I give the overall prediction for the relative rates of plural omission in these types of QP (repeated from (12) in section 4.2).

(6) N-pl > 'some' + N-pl $\not\approx$ Num1 + Adj + Adj + N-pl > Num1 + N-pl

All things considered, this prediction was borne out for each proficiency group. Even so, I recommended replicating some of the comparisons implicit within (6) with larger groups in order to boost the statistical power of these comparisons. I also drew attention to the fact that the intermediate KLEs in this study omitted plural inflection *less* frequently in N-pl than in Num1 + Adj + Adj + N-pl QPs. I tentatively attributed this to a resource-depletion effect in concorded QPs which was especially characteristic of lower-proficiency production.

We can now briefly consider the implications of the overall findings of this thesis for the Full Transfer / Full Access (FTFA) model of L2 acquisition (see chapter 1). While these results have, on the whole, borne out the main claim that has been tested, their implications for the model in question are more difficult to evaluate. In chapter 1, I noted that the PTH (in its relaxed form), the EH and the PH are consistent with this model, but that the hypothesis tested in experiment 1 is not (since a syntactic deficit is crucially assumed within this particular theory of variability). It subsequently turned out that the results of experiment 1 were inconclusive. In short, the only hypotheses that were either supported or refuted in this thesis were the PTH and the PH in experiments 2 and 3 respectively.¹ The upshot is that the FTFA model of L2 acquisition receives some corroboration in this thesis, but that there is no compelling evidence either for or against a model which assumes a persistent representational deficit instead.

Since the publication of Trenkic (2007) plus other research directly stimulated by this experiment, asymmetries in L2 functional morphology have been studied in other scenarios. For example, Trenkic and Pongpairroj (2013) found that Thai learners omit articles more often with referents that are more salient in discourse terms than with

¹ Note, however, that the EH and the PH were tested against each other, so that only one of these hypotheses could have been supported anyway.

other referents (e.g., more often with the subject than the object in a sentence like ‘The red fish has eaten the blue fish’). In a similar vein, Austin, Pongpaioj and Trenkic (2014) demonstrated that, for certain tasks, Thai learners of English omit definite articles more frequently in definite plurals (e.g., ‘the dogs’) than definite singulars (e.g., ‘the dog’), while plurals are omitted more frequently in definite plurals than bare plurals (e.g., ‘dogs’). The present thesis is a further contribution to this burgeoning area of research. It remains to be seen what other patterns of this type receive attention from investigators in future, and what these asymmetries can tell us about the sources of variability in L2 functional morphology.

In a less direct way, the findings of this thesis have some modest implications for L2 pedagogy and proficiency assessment as well. All too often, the results of a study such as this one languish on the shelves of ‘pure’ science, and their practical relevance goes not merely unrecognised but unexplored. However, if we reach a better understanding of the factors which influence the use of functional morphology in L2 English, it surely follows that these features of English can be taught more effectively and assessed more accurately. For instance, in light of the results of experiment 3, it may well be advisable to take into account whether the learner makes a plural error in a bare noun like ‘cars’ or in a concorded phrase like plural like ‘eight big white cars’ when assessing her ability to use this construction accurately.

Lastly, one key limitation of this thesis must be acknowledged: it focuses only on spoken production. Recall that, within each of chapters 2 to 4, I suggested ways in which the experiment reported in that chapter might be fruitfully extended within a production-based modality. A more general extension of the overall results of this thesis would be to test the sorts of hypotheses featured herein using a methodology which triangulates a production-based task with a comprehension-based task. The key advantage of this two-pronged approach is that comprehension measures are, by their very nature, not subject to the performance-related effects which inevitably ‘corrupt’ the data gained via production. Hence, the use of a comprehension task in tandem with a production task might enable us to get at the underlying mental representations of functional features more easily than is possible using the latter type of measure alone. We could then more accurately gauge the extent to which competence and performance diverge from each other in L2 acquisition generally (if indeed there is a divergence). This information would be especially important for testing a theory such as the MSIH

which takes it as a given that underlying syntactic representations are intact, and that all of the variability observed in morphological production is due to performance factors.

References

- Abney, S.P. (1987). *The English noun phrase in its sentential aspect* (PhD dissertation, MIT).
- Alexiadou, A. & Wilder, C. (1998). Adjectival modification and multiple determiners. In A. Alexiadou & C. Wilder (Eds.) *Possessors, predicates and movement in the DP* (pp. 303-332). Amsterdam: John Benjamins.
- Allan, D. (2004). *Oxford Placement Test*. Oxford: Oxford University Press.
- Austin, G. (2010a). *Number sensitization in plural production: Support from Korean speakers of English*. Paper presented at the 2010 Seoul International Conference on Linguistics (SICOL 2010), Korea.
- Austin, G. (2010b). *The Number Sensitivity Hypothesis: Accounting for asymmetries in L2 plural production*. Paper presented at the Japan Second Language Association Annual Conference (J-SLA 2010), Gifu City, Japan.
- Austin, G., Pongpairoj, N., & Trenkic, D. (2014). Structural competition in second language production: Towards a constraint-satisfaction model. Submitted to *Language Learning*.
- Avery, P. & Radisić, M. (2007). Accounting for variability in the acquisition of English articles. In A. Belikova, L. Meroni & M. Umeda (Eds.), *Proceedings of the 2nd Conference on Generative Approaches to Language Acquisition - North America (GALANA)* (pp. 1-11). Somerville, Mass.: Cascadilla Proceedings Project.
- Bannai, M. (2011). The nature of variable sensitivity to agreement violations in L2 English. In L. Roberts, G. Pallotti & C. Bettoni (Eds.), *EUROSLA Yearbook 11* (pp. 115-137). Amsterdam: John Benjamins.
- Barwise, J. & Cooper, R. (1981). Generalized quantifiers and natural language. *Linguistics and Philosophy*, 4, 159-219.

- Benjamini, Y. & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society*, 57(1), 289-300.
- Bickerton, D. (1981). *Roots of language*. Ann Arbor, MA: Karoma Publishers.
- Bošcović, Ž. (2005). On the locality of left branch extraction and the structure of NP. *Studia Linguistica*, 59, 1-45.
- Bruhn de Garavito, J. (2008). Acquisition of the Spanish plural by French L2 speakers: The role of transfer. In J.M. Licerias, H. Zobl & H. Goodluck (Eds.), *The role of formal features in second language acquisition* (pp. 271-298). Mahwah, NJ: Lawrence Erlbaum.
- Cardinaletti, A. & Giusti, G. (2005). The syntax of quantified phrases and quantitative clitics. In M. Everaert & H. van Riemsdijk (Eds.) *The Blackwell companion to syntax*. doi: 10.1111/b.9781405114851.2005.00074.x
- Cardoso, W. (2003). *Topics in the phonology of Picard* (PhD dissertation, McGill University).
- Choi, I. (2005). The internal structure of the Korean DP: Evidence from prenominal and postnominal classifiers. In A. McNay (Ed.), *Oxford working papers in linguistics, philology and phonetics* (pp. 19-38). Retrieved from <http://www.ling-phil.ox.ac.uk/files/uploads/OWP2005.pdf>.
- Chomsky, N. (2001). Derivation by phase. In M. Kenstowicz (Ed.), *Ken Hale: A life in language* (pp. 1-52). Cambridge, MA: MIT Press.
- Chomsky, N. (2005). *On phases*. Unpublished manuscript, Department of Linguistics and Philosophy, Massachusetts Institute of Technology, Cambridge, Massachusetts.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum.
- Corbett, G.G. (2000). *Number*. Cambridge, UK: Cambridge University Press.

- Dao L.H.T. (2007). *Foreign language acquisition: Processes and constraints* (PhD dissertation, Australian National University).
- Demuth, K. & Tremblay, A. (2008). Prosodically conditioned variability in children's production of French determiners. *Journal of Child Language*, 35, 99-127.
- Dryer, M.S. (2005). Coding of nominal plurality. In M. Haspelmath, M.S. Dryer, D. Gil & B. Comrie (Eds.), *The world atlas of language structures* (pp. 138-141). New York: Oxford University Press.
- Duanmu, S. (2000). *The phonology of standard Chinese*. Oxford, UK: Oxford University Press.
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175-191.
- Field, A.P. (2009). *Discovering statistics using SPSS: And sex and drugs and rock 'n' roll* (3rd ed.). London: Sage.
- Gass, S.M. & Mackey, A. (2007). *Data elicitation for second and foreign language research*. Mahwah, NJ: Lawrence Erlbaum.
- Gebhardt, L. (2009). *Numeral classifiers and the structure of DP* (PhD dissertation, Northwestern University).
- Gibson, E. (2000). The dependency locality theory: A distance-based theory of linguistic complexity. In Y. Miyashita, A. Marantz & W. O'Neil (Eds.), *Image, language, brain* (pp. 95-126). Cambridge, MA: MIT Press.
- Giusti, G. (1991). *The categorial status of quantified nominal*. *Linguistische Berichte*, 136, 438-454.
- Goad, H. & Brannen, K. (2003). Phonetic evidence for phonological structure in syllabification. In J. van de Weijer, V. van Heuven & H. van der Hulst (Eds.), *The phonological spectrum, Volume 2* (pp. 3-30). Amsterdam: John Benjamins.

- Goad, H. & White, L. (2004). Ultimate attainment of L2 inflection: Effects of L1 prosodic structure. In S. Foster-Cohen, M. Sharwood Smith, A. Sorace & M. Ota (Eds.), *EUROSLA Yearbook 4* (pp. 119-145). Amsterdam: John Benjamins.
- Goad, H. & White, L. (2006a). Prosodic transfer: L1 effects on the production of L2 determiners. In D. Bamman, T. Magnitskaia & C. Zaller (Eds.), *Proceedings of the 30th Annual Boston University Conference on Language Development* (pp. 213-224). Somerville, Mass.: Cascadilla Press.
- Goad, H. & White, L. (2006b). Ultimate attainment in interlanguage grammars: A prosodic approach. *Second Language Research*, 22, 243-268.
- Goad, H. & White, L. (2009). Prosodic transfer and the representation of determiners in Turkish-English interlanguage. In N. Snape, Y.-k.I. Leung & M. Sharwood Smith (Eds.), *Representational deficits in SLA: Studies in honor of Roger Hawkins* (pp. 1-26). Amsterdam: John Benjamins.
- Goad, H. (2002). Markedness in right-edge syllabification: Parallels across populations. *Canadian Journal of Linguistics*, 47, 151-186.
- Goad, H., White, L., & Steele, J. (2003). Missing inflection in L2 acquisition: Defective syntax or L1-constrained prosodic representations? *Canadian Journal of Linguistics*, 48, 243-263.
- Grodner, D. & Gibson, E. (2005). Consequences of the serial nature of linguistic input for sentential complexity. *Cognitive Science*, 29, 261-291.
- Halle, M. & Marantz, A. (1993). Distributed Morphology and the pieces of inflection. In K. Hale & S.J. Keyser (Eds.), *The View from Building 20: Essays in linguistics in honor of Sylvain Bromberger* (pp. 111-176). Cambridge, MA: MIT Press.
- Hannahs, S.J. (1995). The phonological word in French. *Linguistics*, 33(6), 1125-1144.
- Hawkins, J.A. (1978). *Definiteness and indefiniteness: A study in reference and grammaticality prediction*. London: Croom Helm.
- Hawkins, J.A. (2004). *Efficiency and complexity in grammars*. Oxford: Oxford University Press.

- Hawkins, R. & Casillas, G. (2008). Explaining frequency of verb morphology in early L2 speech. *Lingua*, 118, 595-612.
- Hawkins, R. & Liszka, S. (2003). Locating the source of defective past tense marking in advanced L2 English speakers. In R. van Hout, A. Hulk, F. Kuiken & R. Towell (Eds.), *The interface between syntax and lexicon in second language acquisition* (pp. 21-44). Amsterdam: John Benjamins.
- Hayes, B. (1989). The Prosodic Hierarchy in meter. In P. Kiparsky & G. Youmans (Eds.), *Rhythm and meter* (pp. 201-260). Orlando, FL: Academic Press.
- Hinson, D. & Park, K. (2009). Syntactic error analysis in a short-term intensive English program. *TNTESOL Journal*, 2, 35-48.
- Howell, D.C. (2009). *Statistical methods in psychology* (7th ed.). Stamford, Conn.: Cengage Learning.
- Huebner, T. (1983). *A longitudinal analysis of the acquisition of English*. Ann Arbor: Karoma Publishers.
- Ionin, T., Ko, H., & Wexler, K. (2004). Article semantics in L2 acquisition: The role of specificity. *Language Acquisition*, 12(1), 3-69.
- Jo, M.-J. (2002). The structure of relative clauses in Korean. *Studies in Generative Grammar*, 12, 107-138.
- Kang, E. (2004). *Edge-demarcation in phonology* (PhD dissertation, Cornell University).
- Kang, O. (1992). Word-internal prosodic words in Korean. *University of Washington Working Papers in Linguistics 10* (pp. 125-146).
- Kaye, J. (1990). 'Coda' licensing. *Phonology*, 7, 301-330.
- Kaye, J., Lowenstamm, J., & Vergnaud, J.-R. (1990). Constituent structure and government in phonology. *Phonology*, 7(2), 193-231.

- Kim, K. & Lakshmanan, U. (2009). The processing role of the article choice parameter: Evidence from L2 learners of English. In M. Garcia Mayo & R. Hawkins (Eds.), *Second language acquisition of articles: Empirical findings and theoretical implications* (pp. 87-113). Amsterdam: John Benjamins.
- Kline, R.B. (2004). *Beyond significance testing: Reforming data analysis methods in behavioral research*. Washington: American Psychological Association.
- Klinge, A. (2005). *The structure of English nominals: A study of correlations between form, distribution and function* (PhD dissertation, Copenhagen Business School).
- Ko, H. (2006). Base-output correspondence in Korean nominal inflection. *Journal of East Asian Linguistics*, 15(3), 195-243.
- Koo, M.-C. & Lehmann, C. (2010). Modality in the Korean suffix *-keyss*. *Language Research*, 46(1), 1-14.
- Lardiere, D. (1998a). Case and tense in the 'fossilized' steady state. *Second Language Research*, 14(1), 1-26.
- Lardiere, D. (1998b). Dissociating syntax from morphology in a divergent L2 end-state grammar. *Second Language Research*, 14(4), 359-375.
- Lardiere, D. (2000). Mapping features to forms in second language acquisition. In J. Archibald (Ed.), *Second language acquisition and linguistic theory* (pp. 102-129). Malden, MA and Oxford: Blackwell.
- Lardiere, D. (2003). Second language knowledge of [+/-Past] vs. [+/-Finite]. In J. M. Liceras, H. Zobl & H. Goodluck (Eds.), *Proceedings of the 6th Generative Approaches to Second Language Acquisition Conference (GASLA 2002)* (pp. 176-189). Somerville, MA: Cascadilla Proceedings Project.
- Lardiere, D. (2007). *Ultimate attainment in second language acquisition: A case study*. Mahwah, NJ: Lawrence Erlbaum.
- Lardiere, D. (2009). Some thoughts on a contrastive analysis of features in second language acquisition. *Second Language Research*, 25(2), 173-227.

- Larson-Hall, J. & Herrington, R. (2010). Improving data analysis in second language acquisition by utilizing modern developments in applied statistics. *Applied Linguistics*, 31(3), 368-390.
- Larson-Hall, J. (2006). What does more time buy you? Another look at the effects of long-term residence on production accuracy of English /ɪ/ and /I/ by Japanese speakers. *Language and Speech*, 49(4), 521-548.
- Larson-Hall, J. (2009). *A guide to doing statistics in second language research using SPSS*. London: Routledge/Taylor & Francis.
- Lee, H. (1989). *Korean grammar*. Oxford: Oxford University Press.
- Lee, I. & Ramsey, S.R. (2000). *The Korean language*. New York: SUNY Press.
- Lee, Y. (1993). *Topics in the vowel phonology of Korean* (PhD dissertation, Indiana University).
- Leech, G., Rayson, P. , & Wilson, A. (2001). Word frequencies in written and spoken English: Based on the British National Corpus. Retrieved from <http://www.comp.lancs.ac.uk/computing/research/ucrel/bncfreq>.
- Littlewood, W.T. (1981). Language variation and second language acquisition theory. *Applied Linguistics*, 2(2), 150-158.
- Lyons, C. (1999). *Definiteness*. Cambridge: Cambridge University Press.
- Maas, F. (1996). The English competence of Cuban exiles: The case of noun pluralisation. In E. Schneider (Ed.), *Focus on the USA (Varieties of English Around the World)* (pp. 195-210). Amsterdam: John Benjamins.
- Maxwell, S. & Delaney, H. (2004). *Designing experiments and analyzing data: A model comparison perspective* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum.
- McCarthy, C. (2008). Morphological variability in the comprehension of agreement: An argument for representation over computation. *Second Language Research*, 24, 459-486.

- McIlwain, J. & Peterson, P.G. (2005). Signalling plurality in learner English. In I. Mushin (Ed.), *Proceedings of the 2004 Conference of the Australian Linguistics Society* (pp. 1-9).
- Mellow, J.D. & Cumming, A. (1994). Concord in interlanguage: Efficiency or priming? *Applied Linguistics*, 15, 442-473.
- Milsark, G. (1977). Toward an explanation of certain peculiarities of the existential construction in English. *Linguistic Analysis*, 3, 1-29.
- Montrul, S. (2004). *The acquisition of Spanish: Morphosyntactic development in monolingual and bilingual L1 acquisition and in adult L2 acquisition*. Amsterdam: John Benjamins.
- Nespor, M. & Vogel, I. (1986). *Prosodic phonology*. Dordrecht: Foris.
- Nissenbaum, J.W. (2000). *Investigations of covert phrase movement* (PhD dissertation, Massachusetts Institute of Technology).
- O'Grady, W.D. (1997). *Syntactic development*. Chicago: University of Chicago Press.
- O'Grady, W.D., Lee, M. & Choo, M. (2003). A subject-object asymmetry in the acquisition of relative clauses in Korean as a second language. *Studies in Second Language Acquisition*, 25, 433-448.
- Parrish, B. (1987). A new look at methodologies in the study of article acquisition for learners of ESL. *Language Learning*, 37, 361-383.
- Piggott, G. & Newell, H. (2006). *Syllabification, stress and derivation by phase in Ojibwa*. Unpublished manuscript, Department of Linguistics, McGill University, Montreal, Canada.
- Piggott, G. (2008). The spell-out of lexical categories within words: Violating the onset requirement in Ojibwa. In S. Cummins, B. Jankowski & P. Shaw (Eds.), *Toronto Working Papers in Linguistics* 27 (pp. 109-128). Retrieved from <http://twpl.library.utoronto.ca/index.php/twpl/issue/archive>.
- Plungian, V. (1995). *Dogon*. Munich: LINCOM Europa.

- Pongpairoj, N. (2008). *Variability in second language article production: A comparison of L1 Thai and L1 French learners of L2 English* (PhD dissertation, University of York).
- Prévost, P. & White, L. (2000). Missing surface inflection or impairment in second language? Evidence from Tense and Agreement. *Second Language Research*, 16(2), 103-133.
- Prince, E. (1981). Toward a taxonomy of given-new information. In P. Cole (Ed.), *Radical Pragmatics* (pp. 95-126). New York: Academic Press.
- Ritter, E. (1991). Two functional categories in noun phrases: Evidence from Modern Hebrew. In S. Rothstein (Ed.), *Syntax and Semantics 25: Perspectives on Phrase Structure: Heads and licensing* (pp. 37-62). San Diego: Academic Press.
- Rizzi, L. (1997). The fine structure of the left periphery. In L. Haegeman (Ed.), *Elements of grammar* (pp. 281-337). Kluwer: Dordrecht.
- Roberston, D. (2000). Variability of the use of the English article system by Chinese learners of English. *Second Language Research*, 16(2), 135-172.
- Ruxton, G.D. & Beauchamp, G. (2008). Time for some a priori thinking about post hoc testing. *Behavioral Ecology*, 19, 690-693.
- Schütze, C.T. (2001). On Korean 'case stacking': The varied functions of the particles *ka* and *lul*. *The Linguistic Review*, 18(3), 193-232.
- Schwartz, B. D. & Sprouse, R. A. (1994). Word order and nominative case in nonnative language acquisition: A longitudinal study of (L1 Turkish) German interlanguage. In T. Hoekstra & B. D. Schwartz (Eds.), *Language acquisition studies in generative grammar* (pp. 317-368). Amsterdam: John Benjamins.
- Schwartz, B. D. & Sprouse, R. A. (1996). L2 cognitive states and the full transfer/full access model. *Second Language Research*, 12(1), 40-72.
- Selkirk, E. (1996). The prosodic structure of function words. In J. Morgan & K. Demuth (Eds.), *Signal to syntax: Bootstrapping from speech to grammar in early acquisition* (pp. 187-213). Mahwah, NJ: Erlbaum.

- Sharma, D. (2005). Language transfer and discourse universals in Indian English article use. *Studies in Second Language Acquisition*, 27(4), 535-566.
- Slabakova, R. (2006). Learnability in the L2 acquisition of semantics: A bidirectional study of a semantic parameter, *Second Language Research* 22(4), 498-523.
- Slabakova, R. (2008). *Meaning in the second language*. Berlin: Mouton de Gruyter.
- Snape, N. (2006). *The acquisition of the English determiner phrase by Japanese and Spanish learners of English* (PhD dissertation, University of Essex).
- Sohn, H.-M. (2001). *The Korean language*. Cambridge, UK: Cambridge University Press.
- Song, J.-J. (1997). The so-called plural copy in Korean as a marker of distribution and focus. *Journal of Pragmatics*, 27, 203-224.
- Song, J.-J. (2005). *The Korean language: Structure, use and context*. London and New York: Routledge.
- Sproat, R. & Shih, C. (1988). Prenominal adjectival ordering in English and Mandarin. In J. Blevins & J. Carter (Eds.), *Proceedings of the 12th Annual Meeting of the North East Linguistic Society* (pp. 465-489).
- Sproat, R. & Shih, C. (1991). The cross-linguistic distribution of adjective ordering restrictions. In C. Georgopoulos & R. Ishihara (Eds.), *Interdisciplinary Approaches to Language* (pp. 565-593). Kluwer: Dordrecht.
- Suh, E. (2008). The usage and interpretation of Korean *-tul* 'plural' by heritage language speakers. In M. Bowles, R. Foote, S. Perpiñán & R. Bhatt (Eds.), *Selected Proceedings of the 2007 Second Language Research Forum* (pp. 239-251). Somerville, MA: Cascadilla Proceedings Project.
- Tarone, E. & Parrish, B. (1988). Task-related variation in interlanguage: The case of articles. *Language Learning*, 38, 21-44.

- Trenkic, D. (2000). *The acquisition of English articles by Serbian speakers* (PhD dissertation, University of Cambridge).
- Trenkic, D. (2002). Form-meaning connections in the acquisition of English articles. In S. Foster-Cohen, T. Ruthenberg & M. Poschen (Eds.), *EUROSLA Yearbook 2* (pp. 115-133). Amsterdam: John Benjamins.
- Trenkic, D. (2004). Definiteness in Serbian/Croatian/Bosnian and some implications for the general structure of the nominal phrase. *Lingua*, 114, 1401-1427.
- Trenkic, D. (2007). Variability in second language article production: Beyond the representational deficit vs. processing constraints debate. *Second Language Research*, 23(3), 289-327.
- Trenkic, D. (2008). The representation of English articles in second language grammars: Determiners or adjectives? *Bilingualism: Language and Cognition*, 11(1), 1-18.
- Tsimpli, I M. & Dimitrakopoulou, M. (2007). The interpretability hypothesis: Evidence from wh-interrogatives in second language acquisition. *Second Language Research*, 23, 215-242.
- Vangsnes, Ø.A. (2001). On *noun phrase* architecture, referentiality, and article systems. *Studia Linguistica*, 55(3), 249-300.
- VanPatten, B. (1996). *Input processing and grammar instruction: Theory and research*. Norwood, NJ: Ablex.
- Volker, M.A. (2006). Reporting effect size estimates in school psychology research. *Psychology in the Schools*, 43(6), 653-672.
- White, L. (2003). *Second language acquisition and Universal Grammar*. Cambridge, UK: Cambridge University Press.
- White, L. (2008). Some puzzling features of L2 features. In J.M. Liceras, H. Zobl & H. Goodluck (Eds.), *The role of formal features in second language acquisition* (pp. 305-330). Mahwah, NJ: Lawrence Erlbaum.

- Wilcox, R. (2003). *Applying contemporary statistical techniques*. San Diego, CA: Elsevier Science.
- Yoon, J. (2005). Non-morphological determination of nominal particle ordering in Korean. In L. Heggie & F. Ordonez (Eds.), *Clitic and affix combinations: Theoretical perspectives* (pp. 239-282). Amsterdam: John Benjamins.
- Yoon, J. & Lee, W. (2005). Conjunction reduction and its consequences for noun phrase morphosyntax in Korean. In J. Alderete, C.-h. Han & A. Kochetov (Eds.) *Proceedings of the West Coast Conference on Formal Linguistics 24* (pp. 379-387). Somerville, MA: Cascadilla Proceedings Project.
- Yun, J. (2008). Noun-verb asymmetries in Korean phonology. In N. Abner & J. Bishop (Eds.) *Proceedings of the West Coast Conference on Formal Linguistics 27* (pp. 449-457). Somerville, MA: Cascadilla Proceedings Project.
- Young, R. (1988). Variation and the interlanguage hypothesis. *Studies in Second Language Acquisition*, 10, 281-302.
- Young, R. (1993). Functional constraints on variation in interlanguage morphology. *Applied Linguistics*, 14, 76-97.
- Žegarac, V. (2004). Relevance Theory and *the* in second language acquisition. *Second Language Research*, 20(3), 193-211.
- Zwicky, A.M. (1985). Clitics and particles. *Language*, 61(2), 283-305.

Appendix 2.1. Background information about Korean participants

Key to proficiency levels: UI upper intermediate
 LI lower intermediate
 UA upper advanced
 LA lower advanced

(1) intermediate

participant ID	proficiency level	age	gender	occupation	age first started studying English	years spent studying English in Korea	months spent studying English in English-speaking countries	foreign language(s) spoken & level(s) of proficiency attained	dialect(s) of Kor. spoken with parents and other family members / other dialects spoken
IK1	UI	25	M	university student	12	9	18	none	standard Kor. / none
IK2	LI	23	F	university student	10	13	none	none	Gyeongsang / standard Kor.
IK3	LI	26	M	university student	13	10	9	none	standard Kor. & Gangwon / none
IK4	LI	35	M	university student	13	10	2	none	Gyeongsang / standard Kor.
IK5	UI	27	M	university student	14	12	18	none	standard Kor. / none
IK6	LI	27	M	university student	16	7	20	none	Gangwon / standard Kor.
IK7	LI	26	M	university student	14	7	none	none	standard Kor. / none
IK8	LI	29	F	English language instructor	13	16	none	elem Japanese	Chungcheong / standard Kor.
IK9	UI	27	M	university student	13	6	5	none	standard Kor. / none
IK10	UI	28	M	university student	13	8	18	none	standard Kor. / none
IK11	UI	36	F	English language instructor	14	10	none	none	standard Kor. & Gangwon / none
IK12	UI	25	F	English academy manager	14	6	8	none	standard Kor. & Gangwon / Jeju
IK13	LI	20	M	university student	12	8	2	none	standard Kor. & Gangwon / none
IK14	LI	25	M	university student	24	4	12	none	standard Kor. / none

(2) *advanced*

participant ID	proficiency level	age	gender	occupation	age first started studying English	years spent studying English in Korea	months spent studying English in English-speaking countries	foreign language(s) spoken & level(s) of proficiency attained	dialect(s) of Kor. spoken with parents and other family members / other dialects spoken
AK1	UA	22	F	university student	9	12	11	elem Japanese	Jeolla & Gyeongsang / standard Kor.
AK2	LA	25	F	university student	13	10	20	none	standard Kor. & Gangwon / none
AK3	LA	25	M	English language instructor	13	10	11	none	standard Kor. / none
AK4	LA	25	F	university student	8	17	none	none	standard Kor. & Gangwon / none
AK5	LA	26	M	university student	14	3	84	elem Chinese	Gyeongsang / standard Kor.
AK6	LA	28	F	English language instructor	14	8	-	adv Chinese	standard Kor. & Gangwon / none
AK7	LA	23	F	university student	13	8	12	none	standard Kor. & Gangwon / none
AK8	LA	27	M	university student	14	6	12	none	standard Kor. / none
AK9	LA	26	M	university student	12	12	12	elem Japanese	standard Kor. & Gangwon / none
AK10	UA	28	F	university student	13	15	11	none	standard Kor. / none
AK11	LA	32	F	university student	13	13	-	none	standard Kor. & Gangwon / none
AK12	LA	31	F	university student	11	12	6	none	standard Kor. & Gangwon / none
AK13	UA	35	F	English language instructor	13	9	36	elem Germ. & interm Chinese	standard Kor. & Chungcheong / none
AK14	UA	30	F	university student	12	16	24	none	standard Kor. & Gangwon / none

Appendix 2.2. Materials for language test

<p>Think of one memorable (기억할 만한) experience you have had (e.g., you went somewhere very interesting on holiday). Where and when was it? Who were you with? Describe what happened. (It doesn't matter if it's a good experience or a bad experience.)</p>	<p>What do you do in your free time (e.g., play the guitar)? How often do you do it? Why do you enjoy doing it?</p>
<p>Describe in detail the layout (배치) of the town or city you know best in your native country. What are its main features or attractions (e.g., a famous building, mountain or park)? Describe two or three of these features or attractions in detail. Why should someone (not) visit these? Have you ever been there yourself? When? With whom?</p>	<p>Think of one person you know well (e.g., a family member or close friend). Provide some background information about this person (e.g. physical appearance (용모와 자태, 풍채), job, personality). Try to mention at least six things that this person does in her/his daily routine (일과).</p>
<p>What is your favourite TV program or book? (Choose either of these.) Describe its content in detail. Why do you like it?</p>	<p>Choose a topic that you know a lot about, and tell me about it. Any topic would be OK. Examples: animals, music, movies, Korean history.</p>

Appendix 2.3. Descriptors for proficiency assessment

SET A: fluency

upper advanced	<ul style="list-style-type: none"> • The learner’s speech almost always flows smoothly, and she rarely need to repeat herself, correct herself and/or slow down in order to keep going • She rarely appears to have difficulty thinking of the right words and grammar to express her ideas • She rarely appears to have difficulty talking about a topic at length and in detail, and she can usually organise her ideas and join them together effectively when she does this
lower advanced	<ul style="list-style-type: none"> • The learner’s speech flows smoothly most of the time; however, she occasionally needs to repeat herself, correct herself and/or slow down a little in order to keep going • She occasionally appears to have difficulty thinking of the right words or grammar to express her ideas, and this appears to make her hesitate; however, she can usually find a way to rephrase her ideas • She can usually talk about a topic at some length and in some detail, though she sometimes appears to have difficulty organising her ideas and joining them together effectively when she does this
upper intermediate	<ul style="list-style-type: none"> • The learner’s speech often flows quite smoothly; however, she sometimes needs to repeat herself, correct herself and/or slow down in order to keep going • She sometimes appears to have difficulty thinking of the right words or grammar to express her ideas, and this makes her hesitate • When she talks about a topic, she sometimes appears to have difficulty organising her ideas and joining them together effectively

lower intermediate	<ul style="list-style-type: none"> • The learner's speech is reasonably smooth sometimes but not very smooth at other times, and in this latter situation she might need to repeat herself, correct herself and/or slow down quite a bit in order to keep going • She often appears to have difficulty thinking of the right words or grammar to express her ideas, and this makes her pause • When she talks about a topic, she often appears to have difficulty organising her ideas and joining them together effectively
upper elementary	<ul style="list-style-type: none"> • Usually, the learner's speech doesn't flow very smoothly; it contains some long pauses and is often repetitive and slow • When she talks about a topic, she can only join her ideas together effectively if they are fairly simple
lower elementary	<ul style="list-style-type: none"> • The learner's speech doesn't flow smoothly; it contains many long pauses and is usually repetitive and slow • She can express simple ideas only, and she can sometimes join these ideas together effectively

SET B: grammatical accuracy and range

upper advanced	<ul style="list-style-type: none"> • The learner can use lots of complex grammar structures (e.g. ‘if’ sentences about hypothetical situations) correctly • The learner makes small mistakes here and there with complex grammar structures in particular, and she might use a particular structure in the wrong situation once in a while (e.g., she might use ‘ought to’ in a situation in which ‘have to’ would be more natural); however, she rarely makes the same mistake repeatedly
lower advanced	<ul style="list-style-type: none"> • The learner can use several complex grammar structures correctly • She sometimes makes small mistakes with complex grammar structures in particular, and a few of these mistakes are ones that she makes repeatedly
upper intermediate	<ul style="list-style-type: none"> • The learner can use some complex grammar structures correctly • She sometimes makes mistakes with complex grammar structures in particular, and some of these mistakes are ones that she makes repeatedly
lower intermediate	<ul style="list-style-type: none"> • The learner can use several simple grammar structures (e.g. plurals or the past tense) correctly • She can use a couple of complex grammar structures, though these often contain mistakes
upper elementary	<ul style="list-style-type: none"> • The learner can use some simple grammar structures correctly, though she sometimes appears to use phrases that she has memorised (e.g. ‘I think so’ or ‘That’s really interesting’) instead • She cannot use any complex grammar structures with any degree of accuracy

lower elementary	<ul style="list-style-type: none">• The learner can use a couple of simple grammar structures correctly, though she often uses phrases that she appears to have memorised instead• She makes a lot of mistakes except when she uses what appear to be memorised phrases
---------------------	--

SET C: pronunciation

upper advanced	<ul style="list-style-type: none"> • The learner can pronounce lots of the sounds in English (e.g. [v] or [θ]) very much like a native speaker • The learner can do the following list of things correctly most of the time: put the stress on the correct part of a word (e.g. ‘re-TURN, not ‘RE-turn’); put the stress on the correct word(s) in a sentence (e.g. ‘We BOUGHT a BOOK for the TEACHER’, not ‘We bought A book FOR THE teacher’); join the words in a sentence together (e.g. ‘I want_a big_orange’); and make the pitch of her voice go up in questions and down in statements in a natural way • People rarely appear to have problems understanding her
lower advanced	<ul style="list-style-type: none"> • The learner can pronounce most of the sounds in English very well • She can do the list of things mentioned above correctly part of the time • People occasionally appear to have problems understanding her, though these problems tend to be minor
upper intermediate	<ul style="list-style-type: none"> • The learner can pronounce most of the sounds in English well, though she occasionally mispronounces these sounds • She can do two or three of the list of things mentioned above correctly part of the time • People sometimes appear to have problems understanding her, though these tend to be minor
lower intermediate	<ul style="list-style-type: none"> • The learner can pronounce some of the sounds in English well, though she occasionally mispronounces these sounds • She can do two or three of the list of things mentioned above correctly some of the time • People sometimes appear to have problems understanding her

upper elementary	<ul style="list-style-type: none">• The learner can pronounce only a few of the sounds in English well, and she sometimes mispronounces these sounds• She can do only one of the list of things mentioned above correctly some of the time• People often appear to have problems understanding her
lower elementary	<ul style="list-style-type: none">• The learner can pronounce only a few of the sounds in English, and not very well• She rarely does any of the list of things mentioned above correctly• People often appear to have problems understanding her, and these tend to be major

Appendix 2.4. Story texts

key to formatting of stimulus DPs according to experiment:

experiment 1	dashed underlining
experiment 2	bold italics
experiment 3	double underlining

- 1.1 Paul worked in a fruit shop in London for five years.
- 1.2 He had to *sweep* the floor and *check* the ceiling for rats.
- 1.3 He would *sulk* for days because he disliked his boss.
- 1.4 She would *insult* Paul and call him a *klutz* very often.
- 1.5 Paul would *rant* for hours about his boss to a friend from Japan.
- 1.6 Yesterday, Paul won a lot of money in a casino.
- 1.7 Today, the lucky young man *resigned* from his job.
- 2.1 Last month, Lisa went shopping for a dress in town.
- 2.2 The dress was a birthday present for her friend Betty.
- 2.3 Lisa bought a dress with eight fancy new zips for Betty.
- 2.4 After that, Lisa bought some cans full of lemonade.
- 2.5 Then, a thirsty young woman stole the cans from her.
- 2.6 Lisa was so surprised that she didn't *blink* for two minutes.
- 2.7 She *dropped* Betty's dress on the ground in front of a truck.
- 3.1 Vicki moved into an old house in Madrid yesterday.
- 3.2 She bought three locks for the door to keep burglars out.
- 3.3 She also bought some mops for the kitchen last week.
- 3.4 Her husband got seven ducks for the garden too.
- 3.5 He wants to make a pond for the ducks under a tree.
- 3.6 Because the house is old, the roof might *collapse* very easily.
- 3.7 Her husband *wants* Vicki to *sell* the shaky old house next week.

- 4.1 Last month, Andy went fishing early in the morning.
4.2 He was careful not to go into the water:
4.3 he knew that he might **drown** there easily.
4.4 Andy **pulled** five crabs from a hole inside a big rock.
4.5 But the crabs very quickly tried to hide behind the rock.
4.6 Andy caught a clumsy young crab with a broken leg.
4.7 But he decided to **dump** the crab in the water.
- 5.1 John has a garden behind his house in Paris.
5.2 He keeps a **pet** frog in a **well** by a tree there.
5.3 He wants to **milk** five of his goats in a **tent** beside the tree.
5.4 John also keeps **nine hens** from New York in the garden.
5.5 He has **six owls** from Italy and some pigs from Spain too.
5.6 John **sits** for hours in the sunny new garden every day.
- 6.1 Annie lives in Chile with **two pets** from China.
6.2 She has a **fox** from Beijing and a black dog from Shanghai called Frank.
6.3 Every morning, Frank **yelps** very loudly before dawn.
6.4 After Annie goes to bed, he **howls** for three hours.
6.5 When Annie's friends visit her, he **jumps** fiercely at them.
6.6 Annie **thinks** Frank is very cute, but her friends disagree.
6.7 They say the noisy black dog should live somewhere else.
- 7.1 Mark works as a circus **clown** seven days a week.
7.2 He **stops** for a meal only once or twice a day.
7.3 He always wears a **cap** from Scotland; it **fits** very well.
7.4 He also wears some socks from Brazil which I gave him.
7.5 His friends **want** Mark to **resign** from his job, but he won't.
7.6 He likes making kids **feel** very happy, so he keeps working.

- 8.1 Mary owns a shop near *two mines* far from the city.
- 8.2 In the shop Mary has *nine silks* from Washington.
- 8.3 She will *grin* very broadly when she takes out the silks for you.
- 8.4 Don't take a drink into the shop: you might *spill* the drink on the silks.
- 8.5 Mary also sells hats from Hong Kong and frocks from Peru.
- 8.6 Every day, she *compiles* very long lists of the things in the shop.
- 9.1 Barry has a very boring job in a large office.
- 9.2 He has to *scan* documents, *send* messages and *print* pictures.
- 9.3 He also has to *fix* photocopy machines all day.
- 9.4 But Barry *grins* very often and makes everyone feel happy.
- 9.5 He works next to a *lamp* from Thailand that his son bought.
- 9.6 Behind the lamp is a picture of a *duck* flying in the sky.
- 9.7 Soon, Barry plans to *adopt* nine children from India.
- 10.1 Mandy and her father made a *pact* four weeks ago:
- 10.2 if she studies hard, her father will buy her a horse.
- 10.3 Mandy *slept* badly that night because she was excited.
- 10.4 Last week, she got a high score in a test at school.
- 10.5 That day, her father *knocked* very loudly on the front door.
- 10.6 Mandy *checked* quickly and saw him with a lovely old horse.
- 10.7 Her father *helped* Mandy to climb onto the horse.
- 11.1 Benny is a *monk* from London with a very strange lifestyle.
- 11.2 For breakfast, Benny usually eats nuts from Brazil.
- 11.3 He has a *false* foot so he can't run very quickly.
- 11.4 But he caught and ate *ten rats* for lunch yesterday.
- 11.5 Then he filled a tin with water and took *three gulps* from it.
- 11.6 Sometimes he *picks* flowers and puts them in a pretty black vase.
- 11.7 Every night Benny *wins* five thousand dollars playing poker.

- 12.1 Nick has a lovely garden in front of his house.
- 12.2 He can *pick* plums very easily in the garden.
- 12.3 Nick's friend Danny often works in the garden for him.
- 12.4 Yesterday he *swept* Nick's garden to remove some leaves.
- 12.5 Then Danny carried nine heavy brown logs for his friend.
- 12.6 After that he *chopped* four of the logs for Nick as well.
- 12.7 I *think* Danny should get a job in an office next time.
-
- 13.1 Mike and Bonnie were at the bank last Saturday.
- 13.2 Suddenly some masked men ran into the building.
- 13.3 The men were waving six scary long guns very proudly.
- 13.4 One of the robbers fell and dropped his gun near Mike.
- 13.5 Mike picked up the gun and started to *pull* the trigger.
- 13.6 He wanted to *defend* Bonnie from the robbers.
- 13.7 The robbers threw the guns far away and escaped.
- 13.8 After that, the bank *banned* customers from wearing masks.
-
- 14.1 Ron is a very rich prince from Cambodia.
- 14.2 He keeps a lot of expensive things in his office.
- 14.3 He has a gold *pen* from Greece and a silver *owl* from France.
- 14.4 Ron has *three lamps* from Italy and eight bells from Spain too.
- 14.5 The things in the office *shine* very brightly on the desk.
- 14.6 Ron bought a *lock* for the office to keep his things safe.
- 14.7 He wants a handyman to *install* the lock today.
-
- 15.1 David and Vera live near a *mine* far from the city.
- 15.2 Sometimes David *insults* Vera because she likes to *spend* money.
- 15.3 When the sun *shines* very strongly, they play a game with friends.
- 15.4 They like to play with two happy young vets from London.
- 15.5 David always expects to *win* very easily.
- 15.6 They got a shiny new *bell* for one of their dogs last week.
- 15.7 Every morning the dog *licks* Vera's nose to say 'hello'.

- 16.1 Vic is an old man who sells flags for a living.
- 16.2 Yesterday a *rat* bit him while he was working.
- 16.3 When a nurse tried to *cleanse* Vic's wound, he wanted to *howl* with pain.
- 16.4 Then an old doctor had to *wrap* the wound for him.
- 16.5 The nurse brought some medicine, and Vic took a *gulp* from the bottle.
- 16.6 Finally, the gentle old doctor checked his *pulse* for him.
-
- 17.1 Harry works in a bakery in Argentina.
- 17.2 Last night, he baked ten tiny white buns very nicely.
- 17.3 Then he had to *chop* four apples and some peaches.
- 17.4 Next, he put the fruit in the buns for the customers.
- 17.5 Harry wants to quit his job and *act* for a living.
- 17.6 He is going to play a baker in a funny new movie.
- 17.7 I think he will *opt* for a different role next time.
-
- 18.1 Kevin went to the dentist yesterday with his wife.
- 18.2 He *felt* nervous, so he didn't *sleep* deeply the night before.
- 18.3 But he managed to *smile* bravely and *sit* very still.
- 18.4 After the dentist had finished, Kevin bought an ice-cream.
- 18.5 The ice-cream began to *melt* because the weather was hot.
- 18.6 So Kevin's wife threw the ice-cream into a dirty brown box.
- 18.7 After that, Kevin *sulked* for more than one hour.
-
- 19.1 Last week Gary went to the zoo to look at the monkeys.
- 19.2 He saw a brown monkey sitting alone in a cage.
- 19.3 Gary wanted to *help* the monkey very much.
- 19.4 He told the zoo keepers that the monkey was lonely.
- 19.5 They saw that Gary could *deal* very well with animals.
- 19.6 So they gave the lonely brown monkey a *hen* to play with.
- 19.7 They often *consult* Gary when the monkey is unhappy.

- 20.1 Nina has a shop ten kilometres from Pusan.
- 20.2 *Two monks* from Portugal work in the shop with her.
- 20.3 Last night she heard someone *knock* four times on the front door.
- 20.4 Her dog *growled* very softly when it heard the noise.
- 20.5 The man at the door said Nina had won one thousand dollars.
- 20.6 Nina *blinked* very slowly, and then she shouted for joy.
- 20.7 The monks will keep the money in some sacks for her.
-
- 21.1 On Bill's birthday, his family gave him some bags filled with gifts.
- 21.2 He got four pens from his wife and *ten belts* from his brother.
- 21.3 Bill got *nine caps* from his father which didn't *fit* very well.
- 21.4 So he *dumped* five of the caps very angrily in the sea.
- 21.5 Bill's sister gave him a *lens* for his camera too.
- 21.6 At the party, *two clowns* from Sydney did a dance for him.
-
- 22.1 At work yesterday, Minnie *dealt* very badly with some tasks.
- 22.2 First, she deleted a *file* from her computer by mistake.
- 22.3 The file was important, so she regretted this *lapse* very much.
- 22.4 Minnie's mistake made her boss *frown* very angrily.
- 22.5 The young man threw a *cup* filled with hot coffee on her computer.
- 22.6 Then the angry young boss gave her some data to *compile* for him.
- 22.7 She made him even angrier by losing the data.
-
- 23.1 Vincent and his mother live in *two tents* far from the city.
- 23.2 Every day, she *wraps* Vincent's lunch in *silk* from China.
- 23.3 Sometimes she tries to *stop* Vincent from studying too hard.
- 23.4 But he *frowns* very angrily and keeps studying.
- 23.5 He sits at a narrow old desk and works all day.
- 23.6 He wants to *blitz* four of his courses and *attend* medical school.
- 23.7 Then Vincent wants to *build* four houses and buy a car.

- 24.1 Matt has a very large farm near Los Angeles.
- 24.2 Every day, he *milks* five cows; then he *sells* four litres of milk.
- 24.3 His cats *lick* the milk up if it *spills* from the bucket.
- 24.4 He has *nine wells* filled with dirty water near the cows.
- 24.5 There are also some pups from England on the farm.
- 24.6 The pups like playing in the wells very late at night.
- 24.7 They *yelp* very loudly when they play in the wells.
- 25.1 Jimmy visited London Zoo five days ago.
- 25.2 He saw some tourists taking photographs of the tigers.
- 25.3 Suddenly one of the tigers started to *growl* quietly.
- 25.4 Then the tiger broke open its cage with its teeth.
- 25.5 Jimmy caught the tiger and put it back in the cage.
- 25.6 Then he had to *weld* four of the bars back together.
- 25.7 The zoo owner decided to *ban* photographs in the zoo.
- 26.1 Lily received a lot of presents for Christmas.
- 26.2 She likes wigs very much, but no-one gave her a wig.
- 26.3 Instead, her sister bought two cups from Iran for her.
- 26.4 And her mother gave Lily a *belt* from Poland.
- 26.5 She *spent* more than fifty dollars on the belt.
- 26.6 Lily *smiled* very happily when she saw it.
- 26.7 She got seven hungry green frogs from a cousin too.
- 26.8 The frogs can *jump* two or three metres in the air.
- 27.1 Wendy bought a computer last Saturday.
- 27.2 First of all, she *scanned* five dusty thick maps from Tokyo.
- 27.3 Then, she *sent four files* very easily to Japan.
- 27.4 But when she *installed* nine programs, the hard disk crashed.
- 27.5 After that, she wanted to find a place to dump the computer.
- 27.6 That night, Wendy drove to a river near her house.
- 27.7 She tried to *drop* the heavy new computer in the river.
- 27.8 But she *drowned* very quickly in the water instead.

Appendix 2.5. Data sets for experiment 1

participant ID	proficiency level	EI							SR						
		the floor (1.2)	the door (3.2)	the garden (3.4)	the trigger (13.5)	the desk (14.5)	the bottle (16.5)	the bucket (24.3)	the floor (1.2)	the door (3.2)	the garden (3.4)	the trigger (13.5)	the desk (14.5)	the bottle (16.5)	the bucket (24.3)
IK1	UI	the	-	the	the	the	the	-	the	∅	the	the	-	the	the
IK2	LI	the	-	-	-	-	-	∅	a	∅	∅	∅	the	a	∅
IK3	LI	the	∅	the	the	-	-	the	∅	∅	the	the	the	∅	∅
IK4	LI	-	-	a	the	the	-	the	∅	∅	∅	a	-	the	the
IK5	UI	∅	the	the	∅	the	-	the	∅	the	the	the	the	the	the
IK6	LI	the	the	the	∅	the	the	the	the	the	the	the	the	the	the
IK7	LI	the	-	-	-	-	-	the	the	the	∅	-	the	the	∅
IK8	LI	the	-	the	∅	the	-	the	the	∅	∅	∅	-	∅	-
IK9	UI	the	-	the	the	the	∅	the	the	the	a	the	the	a	∅
IK10	UI	the	-	-	the	-	the	the	-	∅	∅	the	the	the	the
IK11	UI	the	the	∅	∅	the	-	the	the	the	∅	∅	the	the	the
IK12	UI	the	-	-	∅	-	the	-	the	∅	∅	the	-	∅	∅
IK13	LI	the	-	∅	the	-	-	the	the	∅	∅	∅	∅	∅	-
IK14	LI	the	-	the	∅	-	-	-	the	∅	∅	∅	∅	the	∅

Table A2.5.1: Omission of definite articles in first mentions: intermediate participants

participant ID	proficiency level	EI							SR						
		the rock (4.5)	the tree (5.3)	the lock (14.7)	the wound (16.4)	the cage (25.5)	the belt (26.5)	the river (27.7)	the rock (4.5)	the tree (5.3)	the lock (14.7)	the wound (16.4)	the cage (25.5)	the belt (26.5)	the river (27.7)
IK1	UI	the	the	the	the	the	-	the	the	∅	the	-	the	∅	the
IK2	LI	the	-	a	-	∅	∅	the	the	∅	the	-	∅	∅	the
IK3	LI	the	-	-	-	the	∅	a	∅	∅	∅	-	the	∅	∅
IK4	LI	the	the	the	∅	the	∅	the	the	the	∅	the	the	∅	the
IK5	UI	the	-	the	-	the	the	the	the	-	a	-	the	a	the
IK6	LI	∅	the	-	the	the	∅	the	the	∅	the	-	the	∅	the
IK7	LI	the	-	-	∅	-	the	-	-	the	the	-	the	∅	the
IK8	LI	the	the	-	∅	the	a	the	the	the	∅	∅	the	a	∅
IK9	UI	the	the	the	-	the	the	the	the	∅	∅	the	∅	the	∅
IK10	UI	the	-	∅	-	the	the	∅	the	∅	a	-	the	∅	the
IK11	UI	the	-	-	-	the	∅	the	the	∅	the	-	∅	the	the
IK12	UI	-	the	the	-	the	-	-	-	-	the	-	the	∅	the
IK13	LI	-	-	the	the	the	the	the	-	∅	∅	-	∅	∅	the
IK14	LI	-	-	the	the	-	the	the	the	∅	the	∅	the	a	the

Table A2.5.2: Omission of definite articles in second mentions: intermediate participants

participant ID	proficiency level	EI							SR						
		the floor (1.2)	the door (3.2)	the garden (3.4)	the trigger (13.5)	the desk (14.5)	the bottle (16.5)	the bucket (24.3)	the floor (1.2)	the door (3.2)	the garden (3.4)	the trigger (13.5)	the desk (14.5)	the bottle (16.5)	the bucket (24.3)
AK1	UA	the	the	-	the	the	the	the	the	the	the	∅	the	the	the
AK2	LA	the	-	∅	-	the	a	the	the	∅	the	-	the	a	the
AK3	LA	the	the	the	-	the	-	the	the	the	the	the	-	the	∅
AK4	LA	the	the	the	-	-	the	the	the	the	the	-	the	the	the
AK5	LA	the	the	the	the	the	the	the	the	the	the	the	the	the	the
AK6	LA	the	the	the	the	the	the	∅	∅	the	the	the	the	the	∅
AK7	LA	-	the	a	-	the	a	the	the	∅	a	∅	-	the	the
AK8	LA	-	-	the	-	the	the	the	the	-	∅	the	the	the	the
AK9	LA	the	the	the	the	the	the	the	the	the	the	the	the	a	the
AK10	UA	the	the	-	-	-	-	the	the	the	a	the	the	the	the
AK11	LA	the	the	the	the	-	a	the	the	the	the	the	-	a	the
AK12	LA	the	the	the	the	-	the	the	the	the	the	the	the	the	a
AK13	UA	the	the	the	the	-	the	the	the	the	the	the	-	a	the
AK14	UA	the	-	the	the	the	the	∅	the	the	the	the	the	the	the

Table A2.5.3: Omission of definite articles in first mentions: advanced participants

participant ID	proficiency level	EI							SR						
		the rock (4.5)	the tree (5.3)	the lock (14.7)	the wound (16.4)	the cage (25.5)	the belt (26.5)	the river (27.7)	the rock (4.5)	the tree (5.3)	the lock (14.7)	the wound (16.4)	the cage (25.5)	the belt (26.5)	the river (27.7)
AK1	UA	the	the	the	the	the	the	the	the	-	the	-	the	the	the
AK2	LA	a	the	the	-	the	a	the	a	the	the	-	the	a	the
AK3	LA	the	the	the	the	the	-	the	the	the	the	the	the	the	the
AK4	LA	the	-	the	the	the	the	-	the	the	the	-	the	the	-
AK5	LA	the	-	the	the	the	the	the	∅	the	∅	the	∅	the	the
AK6	LA	-	the	the	-	the	the	the	the	∅	the	-	the	the	the
AK7	LA	-	-	the	the	the	-	a	-	the	the	-	the	a	a
AK8	LA	-	the	the	-	the	the	the	-	the	the	-	the	the	the
AK9	LA	the	-	a	the	the	the	the	the	the	a	-	the	the	the
AK10	UA	the	-	the	-	the	the	-	the	a	the	∅	the	the	the
AK11	LA	the	the	-	the	the	∅	the	the	-	the	-	the	the	the
AK12	LA	the	-	the	-	-	∅	the	the	the	the	-	-	the	the
AK13	UA	the	-	-	the	the	the	the	the	the	-	-	the	the	the
AK14	UA	the	the	-	-	the	the	the	the	the	the	-	∅	the	the

Table A2.5.4: Omission of definite articles in second mentions: advanced participants

participant ID	proficiency level	EI							SR						
		the floor (1.2)	the door (3.2)	the garden (3.4)	the trigger (13.5)	the desk (14.5)	the bottle (16.5)	the bucket (24.3)	the floor (1.2)	the door (3.2)	the garden (3.4)	the trigger (13.5)	the desk (14.5)	the bottle (16.5)	the bucket (24.3)
IK1	UI	the	-	the	the	the	the	-	the	Ø	the	the	-	the	the
IK2	LI	the	-	-	-	-	-	Ø	a	Ø	Ø	Ø	the	a	Ø
IK3	LI	the	Ø	the	the	-	-	the	Ø	Ø	the	the	the	Ø	Ø
IK4	LI	-	-	a	the	the	-	the	Ø	Ø	Ø	a	-	the	the
IK5	UI	Ø	the	the	Ø	the	-	the	Ø	the	the	the	the	the	the
IK6	LI	the	the	the	Ø	the	the	the	the	the	the	the	the	the	the
IK7	LI	the	-	-	-	-	-	the	the	the	Ø	-	the	the	Ø
IK8	LI	the	-	the	Ø	the	-	the	the	Ø	Ø	Ø	-	Ø	-
IK9	UI	the	-	the	the	the	Ø	the	the	the	a	the	the	a	Ø
IK10	UI	the	-	-	the	-	the	the	-	Ø	Ø	the	the	the	the
IK11	UI	the	the	Ø	Ø	the	-	the	the	the	Ø	Ø	the	the	the
IK12	UI	the	-	-	Ø	-	the	-	the	Ø	Ø	the	-	Ø	Ø
IK13	LI	the	-	Ø	the	-	-	the	the	Ø	Ø	Ø	Ø	Ø	-
IK14	LI	the	-	the	Ø	-	-	-	the	Ø	Ø	Ø	the	Ø	the

Table A2.5.5: Substitution of definite articles in first mentions: intermediate participants

participant ID	proficiency level	EI							SR						
		the rock (4.5)	the tree (5.3)	the lock (14.7)	the wound (16.4)	the cage (25.5)	the belt (26.5)	the river (27.7)	the rock (4.5)	the tree (5.3)	the lock (14.7)	the wound (16.4)	the cage (25.5)	the belt (26.5)	the river (27.7)
IK1	UI	the	the	the	the	the	-	the	the	Ø	the	-	the	Ø	the
IK2	LI	the	-	a	-	Ø	Ø	the	the	Ø	the	-	Ø	Ø	the
IK3	LI	the	-	-	-	the	Ø	a	Ø	Ø	Ø	-	the	Ø	Ø
IK4	LI	the	the	the	Ø	the	Ø	the	the	the	Ø	the	the	Ø	the
IK5	UI	the	-	the	-	the	the	the	the	-	a	-	the	a	the
IK6	LI	Ø	the	-	the	the	Ø	the	the	Ø	the	-	the	Ø	the
IK7	LI	the	-	-	Ø	-	the	-	-	the	the	-	the	Ø	the
IK8	LI	the	the	-	Ø	the	a	the	the	the	Ø	Ø	the	a	Ø
IK9	UI	the	the	the	-	the	the	the	the	Ø	Ø	the	Ø	the	Ø
IK10	UI	the	-	Ø	-	the	the	Ø	the	Ø	a	-	the	Ø	the
IK11	UI	the	-	-	-	the	Ø	the	the	Ø	the	-	Ø	the	the
IK12	UI	-	the	the	-	the	-	-	-	-	the	-	the	Ø	the
IK13	LI	-	-	the	the	the	the	the	-	Ø	Ø	-	Ø	Ø	the
IK14	LI	-	-	the	the	-	the	the	the	Ø	the	Ø	the	a	the

Table A2.5.6: Substitution of definite articles in second mentions: intermediate participants

participant ID	proficiency level	EI							SR						
		the floor (1.2)	the door (3.2)	the garden (3.4)	the trigger (13.5)	the desk (14.5)	the bottle (16.5)	the bucket (24.3)	the floor (1.2)	the door (3.2)	the garden (3.4)	the trigger (13.5)	the desk (14.5)	the bottle (16.5)	the bucket (24.3)
AK1	UA	the	the	-	the	the	the	the	the	the	the	∅	the	the	the
AK2	LA	the	-	∅	-	the	a	the	the	∅	the	-	the	a	the
AK3	LA	the	the	the	-	the	-	the	the	the	the	the	-	the	∅
AK4	LA	the	the	the	-	-	the	the	the	the	the	-	the	the	the
AK5	LA	the	the	the	the	the	the	the	the	the	the	the	the	the	the
AK6	LA	the	the	the	the	the	the	∅	∅	the	the	the	the	the	∅
AK7	LA	-	the	a	-	the	a	the	the	∅	a	∅	-	the	the
AK8	LA	-	-	the	-	the	the	the	the	-	∅	the	the	the	the
AK9	LA	the	the	the	the	the	the	the	the	the	the	the	the	a	the
AK10	UA	the	the	-	-	-	-	the	the	the	a	the	the	the	the
AK11	LA	the	the	the	the	-	a	the	the	the	the	the	-	a	the
AK12	LA	the	the	the	the	-	the	the	the	the	the	the	the	the	a
AK13	UA	the	the	the	the	-	the	the	the	the	the	the	-	a	the
AK14	UA	the	-	the	the	the	the	∅	the	the	the	the	the	the	the

Table A2.5.7: Substitution of definite articles in first mentions: advanced participants

participant ID	proficiency level	EI							SR						
		the rock (4.5)	the tree (5.3)	the lock (14.7)	the wound (16.4)	the cage (25.5)	the belt (26.5)	the river (27.7)	the rock (4.5)	the tree (5.3)	the lock (14.7)	the wound (16.4)	the cage (25.5)	the belt (26.5)	the river (27.7)
AK1	UA	the	the	the	the	the	the	the	the	-	the	-	the	the	the
AK2	LA	a	the	the	-	the	a	the	a	the	the	-	the	a	the
AK3	LA	the	the	the	the	the	-	the	the	the	the	the	the	the	the
AK4	LA	the	-	the	the	the	the	-	the	the	the	-	the	the	-
AK5	LA	the	-	the	the	the	the	the	∅	the	∅	the	∅	the	the
AK6	LA	-	the	the	-	the	the	the	the	∅	the	-	the	the	the
AK7	LA	-	-	the	the	the	-	a	-	the	the	-	the	a	a
AK8	LA	-	the	the	-	the	the	the	-	the	the	-	the	the	the
AK9	LA	the	-	a	the	the	the	the	the	the	a	-	the	the	the
AK10	UA	the	-	the	-	the	the	-	the	a	the	∅	the	the	the
AK11	LA	the	the	-	the	the	∅	the	the	-	the	-	the	the	the
AK12	LA	the	-	the	-	-	∅	the	the	the	the	-	-	the	the
AK13	UA	the	-	-	the	the	the	the	the	the	-	-	the	the	the
AK14	UA	the	the	-	-	the	the	the	the	the	the	-	∅	the	the

Table A2.5.8: Substitution of definite articles in second mentions: advanced participants

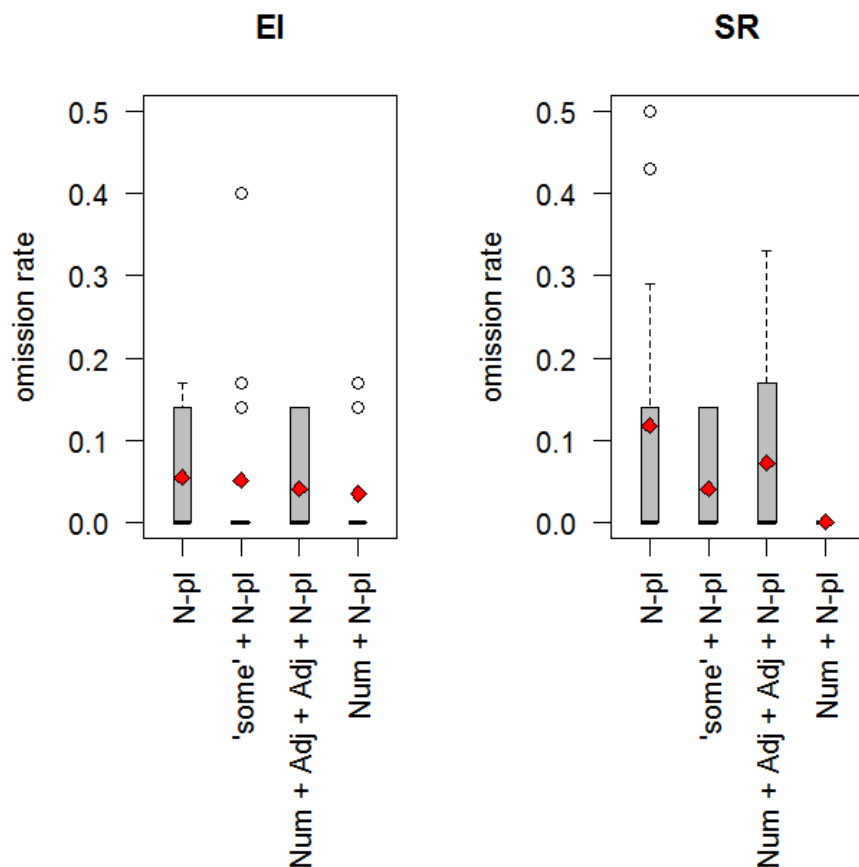
participant ID	IK1	IK2	IK3	IK4	IK5	IK6	IK7	IK8	IK9	IK10	IK11	IK12	IK13	IK14
proficiency level	UI	LI	LI	LI	UI	LI	LI	LI	UI	UI	UI	UI	LI	LI
Japan (1.5)	∅	-	the	∅	∅	∅	-	∅	∅	∅	∅	∅	∅	∅
Italy (5.5)	∅	-	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅
Spain (5.5)	∅	∅	∅	∅	∅	∅	∅	-	-	-	-	-	∅	-
China (6.1)	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	the
Chile (6.1)	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅
Scotland (7.3)	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅
Brazil (7.4)	∅	-	∅	∅	-	∅	-	∅	∅	∅	∅	∅	∅	-
Hong Kong (8.5)	∅	∅	∅	∅	∅	the	-	∅	∅	∅	∅	∅	∅	∅
Peru (8.5)	the	∅	∅	∅	∅	the	∅	-	∅	∅	∅	∅	∅	∅
Thailand (9.5)	-	-	∅	∅	∅	∅	-	∅	∅	∅	∅	-	∅	-
India (9.7)	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	the
Brazil (11.2)	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	-
Cambodia (14.1)	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	the
Greece (14.3)	∅	∅	∅	∅	∅	∅	∅	∅	∅	-	∅	∅	∅	∅
France (14.3)	the	-	∅	∅	∅	∅	-	∅	∅	∅	∅	∅	∅	∅
Italy (14.4)	∅	-	∅	∅	∅	the	∅	∅	-	∅	-	∅	∅	∅
Spain (14.4)	-	∅	-	-	-	the	-	-	-	∅	-	∅	-	-
Argentina (17.1)	∅	∅	∅	-	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅
Portugal (20.2)	∅	-	∅	∅	∅	∅	∅	∅	∅	∅	-	∅	∅	the
China (23.2)	the	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	-
England (24.5)	-	∅	∅	∅	∅	∅	-	∅	∅	∅	∅	∅	the	∅
Iran (26.3)	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	-	∅	∅	the
Poland (26.4)	∅	∅	∅	∅	∅	-	∅	∅	∅	∅	∅	∅	∅	∅
Japan (27.3)	∅	-	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	the	-

Table A2.5.9: Oversuppliance of definite articles before names of countries: intermediate participants

participant ID	AK1	AK2	AK3	AK4	AK5	AK6	AK7	AK8	AK9	AK10	AK11	AK12	AK13	AK14
prof. level	UA	LA	LA	LA	LA	LA	LA	LA	LA	UA	LA	LA	UA	UA
Japan (1.5)	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅
Italy (5.5)	∅	∅	-	∅	∅	∅	∅	∅	-	-	∅	∅	∅	∅
Spain (5.5)	∅	∅	-	-	∅	∅	∅	∅	∅	∅	∅	-	∅	∅
China (6.1)	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅
Chile (6.1)	-	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅
Scotland (7.3)	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅
Brazil (7.4)	∅	∅	∅	∅	∅	∅	∅	∅	-	∅	∅	∅	∅	∅
Hong Kong (8.5)	∅	∅	∅	-	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅
Peru (8.5)	∅	∅	∅	-	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅
Thailand (9.5)	∅	∅	∅	∅	∅	-	-	∅	∅	∅	-	-	∅	∅
India (9.7)	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅
Brazil (11.2)	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅
Cambodia (14.1)	∅	the	∅	∅	the	∅	∅	∅	∅	∅	∅	∅	∅	∅
Greece (14.3)	∅	∅	∅	∅	∅	∅	∅	∅	-	∅	∅	∅	∅	∅
France (14.3)	∅	∅	-	∅	∅	∅	∅	∅	-	∅	∅	∅	∅	∅
Italy (14.4)	∅	∅	-	∅	∅	∅	∅	-	∅	-	-	-	∅	∅
Spain (14.4)	-	∅	-	-	-	∅	∅	-	∅	-	∅	-	∅	∅
Argentina (17.1)	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅
Portugal (20.2)	∅	∅	∅	∅	∅	∅	∅	∅	-	∅	∅	∅	∅	∅
China (23.2)	∅	∅	∅	∅	∅	∅	-	∅	∅	∅	∅	∅	∅	∅
England (24.5)	∅	∅	∅	∅	the	∅	∅	∅	∅	∅	∅	∅	-	∅
Iran (26.3)	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅
Poland (26.4)	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	-	∅	∅	∅
Japan (27.3)	∅	∅	∅	∅	the	∅	∅	∅	∅	∅	∅	∅	∅	∅

Table A2.5.10: Oversuppliance of definite articles before names of countries: advanced participants

Appendix 2.6. Sample boxplot with R code



```

> par(mfrow=c(1,2))
> par(mar = c(10, 4, 4, 2) + 0.1)
> levels(file$phrasetype)=c("N-pl", "'some' + N-pl", "Numl + Adj + Adj + N-pl", "Numl + N-pl")
> a <- boxplot(scores_ei~phrasetype, data=file,ylab="omission rate",
ylim=range(c(0,.5)), col="gray", main="EI", boxwex=.3, las=2)
> mean.value <- tapply(file$scores_ei, file$phrasetype, mean)
> points(seq(a$n), mean.value, pch = 23, bg = "red")
> b <- boxplot(scores_sr~phrasetype, data=file,ylab="omission rate",
ylim=range(c(0,.5)), col="gray", main="SR", boxwex=.3, las=2)
> mean.value <- tapply(file$scores_sr, file$phrasetype, mean)
> points(seq(b$n), mean.value, pch = 23, bg = "red")

```

Appendix 3.1. Data sets for experiment 2: tense

participant ID	proficiency level	EI								SR							
		dropped (2.7)	pulled (4.4)	knocked (10.5)	checked (10.6)	chopped (12.7)	banned (13.8)	scanned (27.2)	installed (27.4)	dropped (2.7)	pulled (4.4)	knocked (10.5)	checked (10.6)	chopped (12.7)	banned (13.8)	scanned (27.2)	installed (27.4)
IK1	UI	∅	∅	t	t	∅	d	d	d	t	∅	t	t	t	d	d	d
IK2	LI	t	d	t	t	t	-	d	∅	t	d	t	t	t	-	d	d
IK3	LI	t	∅	∅	t	t	∅	d	∅	-	d	t	t	t	∅	d	d
IK4	LI	∅	∅	∅	∅	t	d	d	d	t	d	t	∅	t	d	∅	d
IK5	UI	∅	d	t	t	t	d	d	d	-	d	t	t	t	∅	d	d
IK6	LI	∅	-	t	t	t	∅	d	d	∅	d	t	t	t	d	d	d
IK7	LI	t	∅	∅	∅	-	∅	d	∅	t	d	∅	t	∅	d	d	∅
IK8	LI	t	-	t	t	t	-	-	-	-	d	t	t	t	-	d	d
IK9	UI	∅	d	t	t	t	d	d	d	t	d	t	t	t	d	d	d
IK10	UI	t	d	t	∅	t	d	d	d	t	∅	-	t	t	d	d	d
IK11	UI	t	-	t	∅	-	d	d	d	∅	d	t	t	t	d	d	d
IK12	UI	∅	-	t	∅	-	-	d	-	t	∅	t	t	t	-	d	d
IK13	LI	-	-	∅	t	-	-	∅	∅	∅	-	t	t	∅	d	∅	∅
IK14	LI	-	-	t	∅	t	d	d	d	t	∅	∅	∅	∅	-	d	d

Table A3.1.1: Omission of tense inflection in short-stemmed regulars: intermediate participants

participant ID	proficiency level	EI								SR							
		adopt (9.7)	pact (10.1)	defend (13.6)	act (17.5)	opt (17.7)	attend (23.6)	build (23.7)	weld (25.6)	adopt (9.7)	pact (10.1)	defend (13.6)	act (17.5)	opt (17.7)	attend (23.6)	build (23.7)	weld (25.6)
IK1	UI	t	t	d	t	t	d	d	d	t	t	d	t	t	d	d	d
IK2	LI	∅	t	d	t	t	d	d	d	t	∅	d	t	t	d	d	d
IK3	LI	t	t	d	t	t	d	d	∅	t	t	d	t	t	d	d	d
IK4	LI	t	∅	d	-	t	d	-	-	t	∅	d	t	t	d	-	d
IK5	UI	t	t	d	t	t	-	-	d	t	t	d	t	t	d	d	d
IK6	LI	t	t	d	t	t	-	d	d	t	t	d	t	t	d	d	d
IK7	LI	t	t	d	t	-	d	-	-	t	t	d	t	t	d	d	d
IK8	LI	t	t	d	t	-	-	d	-	t	t	d	t	-	d	d	d
IK9	UI	t	t	d	-	t	d	d	d	t	t	d	t	t	d	d	d
IK10	UI	t	t	d	t	t	d	-	d	t	t	d	t	t	d	d	d
IK11	UI	t	∅	d	-	-	-	-	-	t	∅	d	∅	t	d	d	d
IK12	UI	t	t	d	t	t	d	-	d	t	t	d	t	t	d	d	d
IK13	LI	t	t	d	t	t	-	-	d	∅	t	d	t	t	d	d	d
IK14	LI	t	t	d	t	t	d	-	-	t	t	d	t	t	d	d	d

Table A3.1.2: Omission of [t]/[d] in monomorphemic parallels: intermediate participants

participant ID	proficiency level	EI								SR							
		dropped (2.7)	pulled (4.4)	knocked (10.5)	checked (10.6)	chopped (13.1)	banned (13.8)	scanned (27.2)	installed (27.4)	dropped (2.7)	pulled (4.4)	knocked (10.5)	checked (10.6)	chopped (13.1)	banned (13.8)	scanned (27.2)	installed (27.4)
AK1	UA	∅	d	t	t	t	-	d	d	-	d	t	t	t	d	d	d
AK2	LA	t	∅	t	t	t	-	d	∅	t	d	t	t	t	-	d	d
AK3	LA	t	d	t	t	t	d	d	d	t	d	t	t	t	d	d	d
AK4	LA	t	d	t	t	t	d	d	d	t	d	t	t	t	d	d	d
AK5	LA	t	d	t	t	t	d	d	d	t	d	t	t	t	d	∅	d
AK6	LA	-	d	t	t	t	d	d	d	-	d	t	t	t	d	d	d
AK7	LA	∅	d	t	t	t	-	d	d	∅	d	t	t	t	d	d	d
AK8	LA	-	d	t	t	t	d	d	d	t	d	t	t	t	d	d	d
AK9	LA	∅	-	∅	t	t	d	d	d	t	d	∅	t	t	d	d	d
AK10	UA	t	d	t	t	t	d	d	d	t	d	t	t	t	d	d	d
AK11	LA	∅	-	t	∅	t	d	d	d	t	∅	t	t	t	d	d	d
AK12	LA	t	d	t	∅	t	-	d	d	t	d	∅	t	t	d	d	d
AK13	UA	t	d	t	t	t	∅	d	d	t	d	t	t	t	∅	d	d
AK14	UA	t	d	t	t	t	d	d	d	t	d	t	t	t	d	d	d

Table A3.1.3: Omission of tense inflection in short-stemmed regulars: advanced participants

participant ID	proficiency level	EI								SR							
		adopt (9.7)	pact (10.1)	defend (13.6)	act (17.5)	opt (17.7)	attend (23.6)	build (23.7)	weld (25.6)	adopt (9.7)	pact (10.1)	defend (13.6)	act (17.5)	opt (17.7)	attend (23.6)	build (23.7)	weld (25.6)
AK1	UA	t	∅	d	t	t	d	d	∅	∅	∅	d	t	t	-	d	d
AK2	LA	t	t	d	t	t	-	-	d	t	t	d	t	t	d	d	d
AK3	LA	t	t	-	t	t	-	d	d	t	t	d	t	t	d	d	d
AK4	LA	∅	t	d	t	t	d	d	d	t	t	d	t	t	d	d	d
AK5	LA	t	t	d	t	∅	d	d	d	t	t	d	t	t	d	d	d
AK6	LA	t	t	d	t	t	d	d	d	t	t	d	t	t	d	d	d
AK7	LA	t	t	d	t	∅	d	d	∅	t	t	d	t	t	d	d	d
AK8	LA	t	t	d	t	t	-	d	d	t	t	d	t	t	d	d	d
AK9	LA	t	t	d	t	t	d	d	d	t	t	d	t	t	d	d	d
AK10	UA	t	t	d	t	t	d	d	d	t	t	d	t	t	d	d	d
AK11	LA	t	t	d	t	t	-	d	d	t	t	d	t	t	d	d	d
AK12	LA	t	t	d	t	t	d	d	d	t	t	d	t	t	d	d	d
AK13	UA	t	t	d	t	t	d	d	∅	t	∅	d	t	t	d	d	d
AK14	UA	t	t	d	t	t	d	d	d	t	t	d	t	t	d	d	d

Table A3.1.4: Omission of [t]/[d] in monomorphemic parallels: advanced participants

participant ID	proficiency level	EI								SR							
		dropped (2.7)	knocked (10.5)	checked (10.6)	helped (10.7)	chopped (13.1)	sulked (18.7)	blinked (20.6)	dumped (21.4)	dropped (2.7)	knocked (10.5)	checked (10.6)	helped (10.7)	chopped (13.1)	sulked (18.7)	blinked (20.6)	dumped (21.4)
IK1	UI	∅	t	t	t	∅	t	t	t	t	t	t	t	t	t	t	t
IK2	LI	t	t	t	t	t	t	-	t	t	t	t	t	t	t	-	t
IK3	LI	t	∅	t	t	t	t	t	t	-	t	t	t	t	t	t	t
IK4	LI	∅	∅	∅	∅	t	t	∅	-	t	t	∅	∅	t	t	t	t
IK5	UI	∅	t	t	t	t	t	t	t	-	t	t	t	t	t	t	t
IK6	LI	∅	t	t	t	t	t	t	t	∅	t	t	t	t	∅	∅	t
IK7	LI	t	∅	∅	∅	-	∅	t	t	t	∅	t	∅	∅	∅	∅	t
IK8	LI	t	t	t	t	t	t	-	t	-	t	t	t	t	t	-	t
IK9	UI	∅	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t
IK10	UI	t	t	∅	t	t	t	t	t	t	-	t	t	t	t	-	t
IK11	UI	t	t	∅	t	-	-	∅	t	∅	t	t	t	t	t	t	t
IK12	UI	∅	t	∅	t	-	t	t	-	t	t	t	t	t	t	t	t
IK13	LI	-	∅	t	t	-	t	t	t	∅	t	t	t	∅	∅	-	t
IK14	LI	-	t	∅	-	t	∅	∅	t	t	∅	∅	∅	∅	∅	t	t

Table A3.1.5: Omission of tense inflection on stop-final stems: intermediate participants

participant ID	proficiency level	EI								SR							
		resigned (1.7)	pulled (4.4)	banned (13.8)	growled (20.4)	smiled (26.6)	scanned (27.2)	installed (27.4)	drowned (27.8)	resigned (1.7)	pulled (4.4)	banned (13.8)	growled (20.4)	smiled (26.6)	scanned (27.2)	installed (27.4)	drowned (27.8)
IK1	UI	∅	∅	d	-	d	d	d	d	∅	∅	d	d	d	d	d	d
IK2	LI	d	d	-	d	d	d	∅	d	d	d	-	d	d	d	d	d
IK3	LI	∅	∅	∅	-	d	d	∅	d	d	d	∅	d	d	d	d	∅
IK4	LI	∅	∅	d	d	d	d	d	d	d	d	d	d	∅	d	∅	∅
IK5	UI	∅	d	d	d	d	d	d	d	d	d	∅	d	d	d	d	d
IK6	LI	∅	-	∅	d	d	d	d	d	∅	d	d	-	d	d	d	d
IK7	LI	∅	∅	∅	∅	d	d	∅	∅	∅	d	d	∅	∅	d	∅	∅
IK8	LI	d	-	-	d	d	-	-	d	d	d	-	d	d	d	d	d
IK9	UI	d	d	d	-	d	d	d	d	d	d	d	d	d	d	d	d
IK10	UI	∅	d	d	d	d	d	d	d	d	∅	d	-	d	d	d	d
IK11	UI	d	-	d	d	d	d	d	d	d	d	d	d	d	d	d	d
IK12	UI	∅	-	-	d	d	d	-	∅	∅	∅	-	d	d	d	d	∅
IK13	LI	d	-	-	∅	∅	∅	∅	d	∅	-	d	∅	∅	∅	∅	d
IK14	LI	d	-	d	-	d	d	d	-	d	∅	-	∅	d	d	d	d

Table A3.1.6: Omission of tense inflection on sonorant-final stems: intermediate participants

participant ID	proficiency level	EI								SR							
		dropped (2.7)	knocked (10.5)	checked (10.6)	helped (10.7)	chopped (13.1)	sulked (18.7)	blinked (20.6)	dumped (21.4)	dropped (2.7)	knocked (10.5)	checked (10.6)	helped (10.7)	chopped (13.1)	sulked (18.7)	blinked (20.6)	dumped (21.4)
AK1	UA	∅	t	t	t	t	-	t	t	-	t	t	t	t	t	t	t
AK2	LA	t	t	t	t	t	-	t	t	t	t	t	t	t	-	t	t
AK3	LA	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t
AK4	LA	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t
AK5	LA	t	t	t	t	t	∅	t	t	t	t	t	t	t	∅	t	t
AK6	LA	-	t	t	t	t	-	t	t	-	t	t	t	t	t	t	t
AK7	LA	∅	t	t	t	t	t	t	t	∅	t	t	t	t	t	t	t
AK8	LA	-	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t
AK9	LA	∅	∅	t	t	t	t	t	t	t	∅	t	t	t	t	t	t
AK10	UA	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t
AK11	LA	∅	t	∅	t	t	t	t	t	t	t	t	t	t	t	t	t
AK12	LA	t	t	∅	t	t	t	-	t	∅	t	t	t	t	t	t	-
AK13	UA	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t
AK14	UA	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t

Table A3.1.7: Omission of tense inflection on stop-final stems: advanced participants

participant ID	proficiency level	EI								SR							
		resigned (1.7)	pulled (4.4)	banned (13.8)	growled (20.4)	smiled (26.6)	scanned (27.2)	installed (27.4)	drowned (27.8)	resigned (1.7)	pulled (4.4)	banned (13.8)	growled (20.4)	smiled (26.6)	scanned (27.2)	installed (27.4)	drowned (27.8)
AK1	UA	∅	d	-	d	d	d	d	d	d	d	d	∅	d	d	d	d
AK2	LA	d	∅	-	d	d	d	∅	d	d	d	-	d	d	d	d	d
AK3	LA	d	d	d	d	d	d	d	∅	∅	d	d	d	d	d	d	∅
AK4	LA	∅	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d
AK5	LA	∅	d	d	d	d	d	d	d	∅	d	d	d	d	∅	d	∅
AK6	LA	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d
AK7	LA	d	d	-	d	d	d	d	d	d	d	d	d	d	d	d	d
AK8	LA	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	∅
AK9	LA	d	-	d	d	∅	d	d	d	∅	d	d	d	d	d	d	d
AK10	UA	d	d	d	d	d	d	d	d	d	d	d	∅	d	d	d	d
AK11	LA	∅	-	d	-	d	d	d	d	∅	∅	d	-	d	d	d	d
AK12	LA	d	d	-	∅	d	d	d	d	d	d	d	∅	d	d	d	d
AK13	UA	d	d	∅	d	d	d	d	d	∅	d	∅	d	d	d	d	d
AK14	UA	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	∅

Table A3.1.8: Omission of tense inflection on sonorant-final stems: advanced participants

participant ID	proficiency level	EI								SR							
		resigned (1.7)	helped (10.7)	sulked (18.7)	growled (20.4)	blinked (20.6)	dumped (21.4)	smiled (26.6)	drowned (27.8)	resigned (1.7)	helped (10.7)	sulked (18.7)	growled (20.4)	blinked (20.6)	dumped (21.4)	smiled (26.6)	drowned (27.8)
IK1	UI	∅	t	t	-	t	t	d	d	∅	t	t	d	t	t	d	d
IK2	LI	d	t	t	d	-	t	d	d	d	t	t	d	-	t	d	d
IK3	LI	∅	t	t	-	t	t	d	d	d	t	t	d	t	t	d	∅
IK4	LI	∅	∅	t	d	∅	-	d	d	d	∅	t	d	t	t	d	∅
IK5	UI	∅	t	t	d	t	t	d	d	d	t	t	d	t	t	d	d
IK6	LI	∅	t	t	d	t	t	d	d	∅	t	∅	-	∅	t	d	d
IK7	LI	∅	∅	∅	∅	t	t	d	∅	∅	∅	∅	∅	∅	t	∅	∅
IK8	LI	d	t	t	d	-	t	d	d	d	t	t	d	-	t	d	d
IK9	UI	d	t	t	-	t	t	d	d	d	t	t	d	t	t	d	d
IK10	UI	∅	t	t	d	t	t	d	d	d	t	t	-	-	t	d	d
IK11	UI	d	t	-	d	∅	t	d	d	d	t	t	d	t	t	d	d
IK12	UI	∅	t	t	d	t	-	d	∅	∅	t	t	d	t	t	d	∅
IK13	LI	d	t	t	∅	t	t	∅	d	∅	t	∅	∅	-	t	∅	d
IK14	LI	d	-	∅	-	∅	t	d	-	d	∅	∅	∅	t	t	d	d

Table A3.1.9: Omission of tense inflection in long-stemmed regulars: intermediate participants

participant ID	proficiency level	EI						SR					
		slept (10.3)	swept (12.4)	felt (18.2)	dealt (22.1)	spent (26.5)	sent (27.3)	slept (10.3)	swept (12.4)	felt (18.2)	dealt (22.1)	spent (26.5)	sent (27.3)
IK1	UI	ept	ept	-	-	t	t	ept	ept	elt	elt	t	t
IK2	LI	ept	ept	elt	elt	d	t	ept	ept	elt	elt	t	d
IK3	LI	ept	ept	elt	elt	t	t	ept	ept	elt	-	t	t
IK4	LI	ep	ept	elt	elt	d	-	ep	ept	elt	elt	d	d
IK5	UI	ep	ept	-	elt	t	t	ept	ept	elt	elt	t	t
IK6	LI	ep	ep	elt	el	t	t	ep	ept	elt	-	t	t
IK7	LI	-	-	elt	il	d	d	ept	ept	elt	elt	d	d
IK8	LI	-	ept	elt	elt	d	t	ept	ept	elt	elt	t	t
IK9	UI	ept	ept	elt	elt	t	t	ept	ept	elt	elt	t	t
IK10	UI	ept	ept	elt	elt	d	d	ept	ept	elt	elt	t	t
IK11	UI	ep	ept	elt	elt	t	t	ept	ept	elt	elt	t	t
IK12	UI	ept	-	elt	elt	t	t	ept	ept	elt	elt	t	t
IK13	LI	ept	-	elt	elt	t	t	ep	ept	elt	elt	t	t
IK14	LI	-	ept	elt	elt	d	-	ept	ept	elt	il	d	t

Table A3.1.10: Omission of tense inflection in irregulars: intermediate participants

participant ID	proficiency level	EI								SR							
		resigned (1.7)	helped (10.7)	sulked (18.7)	growled (20.4)	blinked (20.6)	dumped (21.4)	smiled (26.6)	drowned (27.8)	resigned (1.7)	helped (10.7)	sulked (18.7)	growled (20.4)	blinked (20.6)	dumped (21.4)	smiled (26.6)	drowned (27.8)
AK1	UA	∅	t	-	d	t	t	d	d	d	t	t	∅	t	t	d	d
AK2	LA	d	t	-	d	t	t	d	d	d	t	-	d	t	t	d	d
AK3	LA	d	t	t	d	t	t	d	∅	∅	t	t	d	t	t	d	∅
AK4	LA	∅	t	t	d	t	t	d	d	d	t	t	d	t	t	d	d
AK5	LA	∅	t	∅	d	t	t	d	d	∅	t	∅	d	t	t	d	∅
AK6	LA	d	t	-	d	t	t	d	d	d	t	t	d	t	t	d	d
AK7	LA	d	t	t	d	t	t	d	d	d	t	t	d	t	t	d	d
AK8	LA	d	t	t	d	t	t	d	d	d	t	t	d	t	t	d	∅
AK9	LA	d	t	t	d	t	t	∅	d	∅	t	t	d	t	t	d	d
AK10	UA	d	t	t	d	t	t	d	d	d	t	t	∅	t	t	d	d
AK11	LA	∅	t	t	-	t	t	d	d	∅	t	t	-	t	t	d	d
AK12	LA	d	t	t	∅	t	-	d	d	d	t	t	∅	t	-	d	d
AK13	UA	d	t	t	d	t	t	d	d	∅	t	t	d	t	t	d	d
AK14	UA	d	t	t	d	t	t	d	d	d	t	t	d	t	t	d	∅

Table A3.1.11: Omission of tense inflection in long-stemmed regulars: advanced participants

participant ID	proficiency level	EI						SR					
		slept (10.3)	swept (12.4)	felt (18.2)	dealt (22.1)	spent (26.5)	sent (27.3)	slept (10.3)	swept (12.4)	felt (18.2)	dealt (22.1)	spent (26.5)	sent (27.3)
AK1	UA	ɛpt	ɛpt	ɛlt	ɛlt	d	t	ɛp	ɛp	ɛlt	ɛlt	d	t
AK2	LA	ɛpt	ɛpt	-	ɛlt	t	t	ɛpt	ɛpt	ɛlt	ɛlt	t	t
AK3	LA	ɛpt	ɛpt	ɛlt	ɛlt	-	t	ɛpt	ɛpt	ɛlt	ɛlt	t	t
AK4	LA	ɛpt	ɛpt	ɛlt	-	t	t	ɛpt	ɛpt	ɛlt	-	t	t
AK5	LA	ɛpt	ɛpt	ɛlt	ɛlt	d	d	ɛpt	ɛpt	ɛlt	ɛlt	d	t
AK6	LA	ɛpt	ɛpt	ɛlt	ɛlt	t	t	ɛpt	ɛpt	ɛlt	ɛlt	t	t
AK7	LA	ɛpt	ɛpt	-	ɛlt	t	t	ɛp	ɛpt	ɛlt	ɛlt	t	t
AK8	LA	ɛp	ɛpt	ɛlt	ɛlt	d	t	ɛp	ɛpt	ɛlt	-	t	t
AK9	LA	ɛpt	ɛpt	ɛlt	ɛlt	t	t	ɛpt	ɛpt	ɛlt	ɛlt	t	t
AK10	UA	ɛpt	ɛpt	ɛlt	ɛlt	t	t	ɛpt	ɛpt	ɛlt	ɛlt	t	t
AK11	LA	ɛpt	ɛpt	ɛlt	-	d	t	ɛpt	ɛpt	ɛlt	-	d	t
AK12	LA	ɛpt	ɛpt	ɛlt	-	d	t	ɛpt	ɛpt	ɛlt	il	d	t
AK13	UA	ɛpt	ɛpt	ɛlt	ɛlt	t	t	ɛpt	ɛpt	ɛlt	ɛlt	t	t
AK14	UA	ɛpt	-	ɛlt	ɛlt	t	t	ɛpt	ɛpt	ɛlt	ɛlt	d	t

Table A3.1.12: Omission of tense inflection in irregulars: advanced participants

Appendix 3.2. Data sets for experiment 2: agreement

participant ID	proficiency level	sits (5.6)	stops (7.2)	fits (7.3)	sells (8.5)	grins (9.4)	picks (11.6)	wins (11.7)	licks (15.7)	wraps (23.2)	spills (24.3)
IK1	UI	s	∅	s	∅	z	-	z	s	s	-
IK2	LI	∅	s	s	-	∅	s	-	s	s	-
IK3	LI	s	∅	-	z	z	-	-	s	s	z
IK4	LI	-	s	∅	-	∅	∅	∅	s	s	-
IK5	UI	s	s	s	z	z	-	-	s	s	z
IK6	LI	s	s	-	z	z	s	z	s	s	z
IK7	LI	-	s	s	z	z	∅	z	-	s	z
IK8	LI	s	s	s	-	z	s	∅	s	s	∅
IK9	UI	s	s	s	z	z	∅	z	s	s	z
IK10	UI	-	s	s	∅	z	-	z	s	s	-
IK11	UI	∅	s	s	-	-	∅	z	s	s	z
IK12	UI	s	s	s	z	z	∅	-	s	s	-
IK13	LI	s	s	s	z	z	∅	z	s	-	∅
IK14	LI	-	s	-	∅	z	∅	-	-	-	-

Table A3.2.1: Omission of agreement inflection in short-stemmed regulars: intermediate participants: EI phase

participant ID	proficiency level	sits (5.6)	stops (7.2)	fits (7.3)	sells (8.5)	grins (9.4)	picks (11.6)	wins (11.7)	licks (15.7)	wraps (23.2)	spills (24.3)
IK1	UI	-	-	s	z	z	∅	-	s	∅	∅
IK2	LI	∅	s	s	z	z	s	-	s	s	∅
IK3	LI	s	∅	-	z	z	-	∅	s	s	z
IK4	LI	∅	∅	∅	∅	∅	∅	-	-	-	-
IK5	UI	s	s	s	z	z	s	z	s	∅	z
IK6	LI	s	s	s	z	∅	s	z	s	s	∅
IK7	LI	∅	s	s	∅	z	s	z	s	s	z
IK8	LI	s	s	s	∅	z	-	-	s	s	-
IK9	UI	s	s	s	z	z	∅	z	s	s	z
IK10	UI	-	∅	s	-	z	-	-	s	-	-
IK11	UI	-	s	s	-	-	s	z	-	s	-
IK12	UI	s	s	s	z	z	∅	-	s	s	∅
IK13	LI	∅	s	-	∅	z	∅	∅	s	-	∅
IK14	LI	-	-	∅	∅	∅	∅	-	∅	-	∅

Table A3.2.2: Omission of agreement inflection in short-stemmed regulars: intermediate participants: SR phase

participant ID	proficiency level	klutz (1.4)	collapse (3.6)	fox (6.2)	fix (9.3)	false (11.3)	cleanse (16.3)	pulse (16.6)	lens (21.5)	lapse (22.3)	blitz (23.6)
IK1	UI	s	s	-	s	∅	Z	s	Z	s	s
IK2	LI	s	-	s	s	s	-	s	Z	-	s
IK3	LI	-	s	s	s	∅	-	s	Z	s	s
IK4	LI	-	s	s	s	s	-	s	Z	-	-
IK5	UI	s	s	s	s	s	Z	-	Z	s	s
IK6	LI	s	s	s	s	s	Z	s	Z	s	s
IK7	LI	s	-	-	-	s	-	s	-	-	s
IK8	LI	-	-	s	s	s	-	s	Z	s	s
IK9	UI	s	s	s	s	s	-	s	Z	s	s
IK10	UI	s	s	s	s	s	Z	s	Z	s	s
IK11	UI	-	-	s	s	s	Z	s	Z	-	-
IK12	UI	-	s	s	s	s	-	s	Z	-	s
IK13	LI	s	s	s	s	s	Z	s	Z	s	s
IK14	LI	-	-	s	s	-	Z	s	Z	-	s

Table A3.2.3: Omission of [s]/[z] in monomorphemic parallels: intermediate participants: EI phase

participant ID	proficiency level	klutz (1.4)	collapse (3.6)	fox (6.2)	fix (9.3)	false (11.3)	cleanse (16.3)	pulse (16.6)	lens (21.5)	lapse (22.3)	blitz (23.6)
IK1	UI	s	s	s	s	-	Z	s	Z	s	s
IK2	LI	s	s	s	s	s	Z	s	Z	s	s
IK3	LI	s	s	s	s	s	-	s	Z	s	s
IK4	LI	s	s	s	s	s	Z	s	Z	∅	s
IK5	UI	s	s	s	s	s	Z	s	Z	s	s
IK6	LI	s	s	s	s	s	Z	s	Z	s	s
IK7	LI	s	-	s	s	s	Z	s	Z	s	s
IK8	LI	s	-	s	s	s	-	s	Z	s	s
IK9	UI	s	s	s	s	s	Z	s	Z	s	s
IK10	UI	s	s	s	s	s	-	s	Z	s	s
IK11	UI	-	s	s	s	s	Z	s	Z	s	s
IK12	UI	s	s	s	s	s	Z	s	Z	s	s
IK13	LI	s	s	s	s	s	Z	s	Z	s	s
IK14	LI	-	s	s	s	-	-	∅	Z	s	s

Table A3.2.4: Omission of [s]/[z] in monomorphemic parallels: intermediate participants: SR phase

participant ID	proficiency level	sits (5.6)	stops (7.2)	fits (7.3)	sells (8.5)	grins (9.4)	picks (11.6)	wins (11.7)	licks (15.7)	wraps (23.2)	spills (24.3)
AK1	UA	s	s	s	-	Z	s	Z	s	s	Ø
AK2	LA	s	s	s	Z	Z	Ø	Z	s	s	Z
AK3	LA	s	s	s	Z	Z	s	Z	-	s	Z
AK4	LA	s	s	s	Z	Z	s	Z	s	s	-
AK5	LA	s	s	s	Z	Z	s	Z	s	s	-
AK6	LA	s	s	s	Z	Z	s	Z	s	s	Z
AK7	LA	s	s	s	Z	Ø	s	Z	s	Ø	Z
AK8	LA	s	s	-	Z	Z	-	Z	-	s	Z
AK9	LA	s	s	s	Z	Z	s	Z	s	s	Z
AK10	UA	s	s	s	Z	Z	s	Z	s	s	Z
AK11	LA	s	s	s	-	Z	Ø	Z	s	s	-
AK12	LA	s	s	s	Z	Z	s	Z	-	s	Z
AK13	UA	s	s	s	Z	Z	s	Z	s	s	Z
AK14	UA	s	s	s	Z	Z	s	Z	s	s	Z

Table A3.2.5: Omission of agreement inflection in short-stemmed regulars: advanced participants: EI phase

participant ID	proficiency level	sits (5.6)	stops (7.2)	fits (7.3)	sells (8.5)	grins (9.4)	picks (11.6)	wins (11.7)	licks (15.7)	wraps (23.2)	spills (24.3)
AK1	UA	s	s	s	Z	Z	s	Z	s	s	-
AK2	LA	s	s	s	Z	Z	s	Z	s	s	Z
AK3	LA	s	s	s	Z	Ø	s	Z	s	s	Z
AK4	LA	s	s	s	Z	Z	s	Z	s	s	-
AK5	LA	s	-	s	Z	Z	-	Z	s	s	-
AK6	LA	s	s	s	Z	Ø	s	Z	s	s	Z
AK7	LA	s	s	s	Z	Z	s	Z	s	Ø	Z
AK8	LA	s	s	s	Z	Z	Ø	Z	s	Ø	Z
AK9	LA	s	s	s	Z	Z	s	Z	s	s	Z
AK10	UA	s	s	s	Z	Z	s	Z	Ø	s	-
AK11	LA	-	s	s	Z	Z	s	-	s	Ø	-
AK12	LA	-	s	s	Z	Z	s	Z	s	s	Z
AK13	UA	s	s	s	Z	Z	s	Z	s	s	Z
AK14	UA	s	s	s	Z	Z	s	Z	s	s	Z

Table A3.2.6: Omission of agreement inflection in short-stemmed regulars: advanced participants: SR phase

participant ID	proficiency level	klutz (1.4)	collapse (3.6)	fox (6.2)	fix (9.3)	false (11.3)	cleanse (16.3)	pulse (16.6)	lens (21.5)	lapse (22.3)	blitz (23.6)
AK1	UA	s	s	s	s	s	-	s	Z	s	s
AK2	LA	s	s	s	s	s	-	s	Z	s	s
AK3	LA	s	s	s	s	s	Z	s	Z	-	-
AK4	LA	s	s	s	s	s	Z	-	Z	s	s
AK5	LA	s	s	s	s	s	Z	s	Z	s	s
AK6	LA	s	s	s	s	s	Z	s	Z	s	s
AK7	LA	s	s	s	s	s	-	s	Z	-	s
AK8	LA	-	s	s	s	s	Z	s	Z	-	s
AK9	LA	s	s	s	-	s	Z	s	-	s	s
AK10	UA	s	s	s	s	s	Z	s	Z	s	s
AK11	LA	s	s	s	s	s	-	s	Z	s	s
AK12	LA	-	s	s	-	s	Z	s	Z	s	s
AK13	UA	s	s	s	s	s	Z	s	Z	s	s
AK14	UA	s	s	s	s	s	Z	s	Z	s	s

Table A3.2.7: Omission of [s]/[z] in monomorphemic parallels: advanced participants: EI phase

participant ID	proficiency level	klutz (1.4)	collapse (3.6)	fox (6.2)	fix (9.3)	false (11.3)	cleanse (16.3)	pulse (16.6)	lens (21.5)	lapse (22.3)	blitz (23.6)
AK1	UA	s	s	s	s	s	-	s	Z	s	s
AK2	LA	s	s	s	s	s	Z	s	Z	s	s
AK3	LA	s	s	s	s	s	Z	s	Z	s	s
AK4	LA	s	s	s	s	s	-	s	Z	s	s
AK5	LA	s	s	s	s	s	Z	s	Z	s	s
AK6	LA	s	s	s	s	s	Z	s	Z	s	s
AK7	LA	s	s	s	s	s	Z	s	Z	s	s
AK8	LA	s	s	s	s	s	Z	s	Z	s	s
AK9	LA	s	s	s	s	s	Z	s	Z	s	s
AK10	UA	s	s	s	s	s	Z	s	Z	s	s
AK11	LA	s	s	s	s	s	-	s	Z	s	s
AK12	LA	s	s	s	s	s	Z	s	-	s	s
AK13	UA	s	s	s	s	s	Z	s	Z	s	s
AK14	UA	s	s	s	s	s	Z	s	Z	s	s

Table A3.2.8: Omission of [s]/[z] in monomorphemic parallels: advanced participants: SR phase

participant ID	proficiency level	wants (3.7)	yelps (6.3)	howls (6.4)	jumps (6.5)	thinks (6.6)	compiles (8.6)	insults (15.2)	shines (15.3)	frowns (23.4)	milks (24.2)
IK1	UI	∅	∅	z	-	∅	∅	∅	∅	∅	s
IK2	LI	∅	-	z	-	∅	z	∅	∅	z	-
IK3	LI	s	s	z	-	∅	z	s	∅	z	s
IK4	LI	∅	∅	z	-	s	∅	∅	∅	z	s
IK5	UI	s	s	z	s	-	z	s	z	z	s
IK6	LI	s	s	z	-	∅	-	∅	-	∅	s
IK7	LI	s	-	z	-	∅	∅	∅	z	z	s
IK8	LI	∅	-	z	-	∅	z	∅	∅	z	-
IK9	UI	s	s	z	-	s	z	s	z	z	s
IK10	UI	∅	∅	z	-	∅	-	∅	∅	∅	s
IK11	UI	s	s	z	-	s	-	s	-	z	-
IK12	UI	s	s	z	-	∅	z	-	-	z	-
IK13	LI	s	∅	z	-	∅	z	∅	∅	z	-
IK14	LI	-	∅	-	-	∅	-	∅	-	-	∅

Table A3.2.9: Omission of agreement inflection in long-stemmed regulars: intermediate participants: EI phase

participant ID	proficiency level	wants (3.7)	yelps (6.3)	howls (6.4)	jumps (6.5)	thinks (6.6)	compiles (8.6)	insults (15.2)	shines (15.3)	frowns (23.4)	milks (24.2)
IK1	UI	∅	-	∅	-	∅	∅	∅	∅	∅	s
IK2	LI	s	∅	∅	-	∅	z	s	∅	z	-
IK3	LI	s	s	z	-	∅	z	s	∅	z	s
IK4	LI	-	∅	∅	-	∅	-	-	z	-	s
IK5	UI	s	s	z	s	s	z	s	z	z	s
IK6	LI	∅	-	z	-	∅	-	∅	-	z	s
IK7	LI	s	s	z	-	s	z	∅	∅	z	s
IK8	LI	s	-	z	s	s	z	∅	∅	z	∅
IK9	UI	-	s	z	-	s	z	∅	∅	z	s
IK10	UI	s	∅	-	-	∅	-	∅	∅	-	-
IK11	UI	-	-	-	-	-	-	s	z	z	-
IK12	UI	s	∅	z	s	∅	z	∅	z	z	s
IK13	LI	s	∅	∅	-	∅	∅	∅	∅	-	s
IK14	LI	-	∅	-	-	-	-	∅	-	∅	∅

Table A3.2.10: Omission of agreement inflection in long-stemmed regulars: intermediate participants: SR phase

participant ID	proficiency level	wants (3.7)	yelps (6.3)	howls (6.4)	jumps (6.5)	thinks (6.6)	compiles (8.6)	insults (15.2)	shines (15.3)	frowns (23.4)	milks (24.2)
AK1	UA	s	s	z	s	s	z	s	∅	z	s
AK2	LA	s	s	z	-	s	-	∅	s	z	s
AK3	LA	s	s	z	s	s	z	s	z	z	s
AK4	LA	s	s	z	-	s	z	s	z	z	∅
AK5	LA	s	s	z	s	∅	z	s	z	z	s
AK6	LA	∅	s	z	-	s	z	s	∅	z	-
AK7	LA	∅	-	-	-	-	z	s	z	z	s
AK8	LA	s	-	-	-	s	z	∅	z	∅	s
AK9	LA	s	s	z	s	s	z	s	z	z	s
AK10	UA	s	s	z	-	s	z	s	z	z	s
AK11	LA	s	∅	z	s	s	z	∅	z	z	∅
AK12	LA	s	-	-	s	s	-	∅	∅	z	s
AK13	UA	s	s	z	s	s	z	s	z	z	s
AK14	UA	∅	s	z	s	s	-	s	z	z	s

Table A3.2.11: Omission of agreement inflection in long-stemmed regulars: advanced participants: EI phase

participant ID	proficiency level	wants (3.7)	yelps (6.3)	howls (6.4)	jumps (6.5)	thinks (6.6)	compiles (8.6)	insults (15.2)	shines (15.3)	frowns (23.4)	milks (24.2)
AK1	UA	s	s	z	s	s	z	s	z	z	s
AK2	LA	s	-	z	s	s	z	s	z	z	s
AK3	LA	s	s	z	s	s	z	s	∅	z	s
AK4	LA	s	s	z	s	s	z	s	z	∅	s
AK5	LA	s	s	z	-	∅	-	s	z	z	s
AK6	LA	s	s	z	-	s	z	s	∅	z	-
AK7	LA	s	-	z	-	-	z	s	∅	z	s
AK8	LA	s	∅	-	-	s	z	s	z	∅	-
AK9	LA	s	∅	z	∅	s	z	s	z	z	s
AK10	UA	s	s	z	s	s	z	s	z	z	s
AK11	LA	s	s	z	s	∅	z	∅	z	z	∅
AK12	LA	s	s	z	s	∅	z	s	∅	z	s
AK13	UA	s	s	z	s	s	z	s	z	z	s
AK14	UA	s	s	z	-	s	z	s	-	∅	s

Table A3.2.12: Omission of agreement inflection in long-stemmed regulars: advanced participants: SR phase

Appendix 3.3. Data sets for experiment 2: plurals

participant ID	proficiency level	locks (3.2)	ducks (3.4)	hens (5.4)	pets (6.1)	rats (11.4)	bells (14.4)	pens (21.2)	caps (21.3)	wells (24.4)	cups (26.3)
IK1	UI	-	s	z	s	s	z	z	s	z	s
IK2	LI	s	s	z	s	-	∅	z	s	z	s
IK3	LI	s	s	z	s	-	-	∅	s	z	s
IK4	LI	s	s	∅	s	s	-	z	s	z	s
IK5	UI	s	s	z	s	s	z	z	s	z	s
IK6	LI	s	s	z	s	s	z	z	s	z	s
IK7	LI	s	-	-	s	s	-	z	s	z	s
IK8	LI	s	s	z	∅	s	z	z	s	z	s
IK9	UI	s	s	z	s	s	-	z	s	z	s
IK10	UI	s	s	z	s	s	-	z	s	z	-
IK11	UI	s	s	z	s	s	-	z	s	z	s
IK12	UI	s	s	z	s	s	z	z	s	z	s
IK13	LI	s	s	z	s	s	z	z	s	z	-
IK14	LI	s	s	-	s	-	-	∅	s	z	∅

Table A3.3.1: Omission of plural inflection in short-stemmed regulars: intermediate participants: EI phase

participant ID	proficiency level	locks (3.2)	ducks (3.4)	hens (5.4)	pets (6.1)	rats (11.4)	bells (14.4)	pens (21.2)	caps (21.3)	wells (24.4)	cups (26.3)
IK1	UI	∅	s	z	s	s	z	z	s	∅	s
IK2	LI	s	s	z	s	s	∅	z	s	z	s
IK3	LI	s	s	z	s	s	∅	z	s	z	s
IK4	LI	s	s	z	s	s	∅	z	s	z	s
IK5	UI	s	s	z	s	s	z	z	s	z	s
IK6	LI	s	s	z	s	s	∅	∅	s	z	∅
IK7	LI	s	s	∅	s	s	z	z	s	z	s
IK8	LI	s	s	z	∅	s	z	z	s	z	s
IK9	UI	s	s	z	s	s	z	z	s	z	∅
IK10	UI	s	s	z	s	s	∅	z	s	z	s
IK11	UI	s	s	z	s	s	z	z	s	z	s
IK12	UI	s	s	z	s	s	z	z	s	z	s
IK13	LI	s	s	z	s	s	∅	z	s	z	∅
IK14	LI	s	-	z	s	-	z	∅	s	z	s

Table A3.3.2: Omission of plural inflection in short-stemmed regulars: intermediate participants: SR phase

participant ID	proficiency level	locks (3.2)	ducks (3.4)	hens (5.4)	pets (6.1)	rats (11.4)	bells (14.4)	pens (21.2)	caps (21.3)	wells (24.4)	cups (26.3)
AK1	UA	s	s	-	s	s	Z	Z	s	Z	s
AK2	LA	s	s	Z	s	s	Z	Z	s	Z	Ø
AK3	LA	s	s	Z	s	-	-	Z	s	Z	s
AK4	LA	s	s	Z	s	s	-	Z	s	Z	s
AK5	LA	s	s	Z	s	s	Z	-	s	Z	s
AK6	LA	s	s	Z	s	s	-	Z	s	Z	s
AK7	LA	s	s	-	s	s	Z	Z	s	Z	s
AK8	LA	s	s	Z	s	-	-	Z	s	-	-
AK9	LA	s	s	Z	s	s	-	Z	s	Z	s
AK10	UA	s	s	Z	s	s	-	Z	s	Z	s
AK11	LA	s	s	Z	s	s	Z	Z	s	Z	s
AK12	LA	s	s	Z	s	s	Z	Z	s	Z	s
AK13	UA	s	s	Z	s	s	Z	Z	s	Z	s
AK14	UA	s	s	Z	s	s	Z	Z	s	Z	s

Table A3.3.3: Omission of plural inflection in short-stemmed regulars: advanced participants: EI phase

participant ID	proficiency level	locks (3.2)	ducks (3.4)	hens (5.4)	pets (6.1)	rats (11.4)	bells (14.4)	pens (21.2)	caps (21.3)	wells (24.4)	cups (26.3)
AK1	UA	s	s	Z	s	s	Ø	Z	s	Z	s
AK2	LA	s	s	Z	s	s	Z	Z	s	Z	s
AK3	LA	s	s	Z	s	s	Z	Z	s	Z	s
AK4	LA	s	s	Z	s	s	Z	Z	s	-	s
AK5	LA	s	s	Z	s	s	Z	Z	s	Z	s
AK6	LA	s	s	Z	s	s	Z	Z	s	Z	s
AK7	LA	s	s	Z	s	s	Z	Z	s	Z	s
AK8	LA	s	s	Z	s	s	Z	Z	s	Z	s
AK9	LA	s	s	Z	s	s	Z	Z	s	Z	s
AK10	UA	s	s	Z	s	s	Z	Z	s	Z	s
AK11	LA	s	s	Z	s	s	Z	Z	s	Z	s
AK12	LA	s	s	Z	s	s	Z	Z	s	Z	s
AK13	UA	s	s	Z	s	s	Z	Z	s	Z	s
AK14	UA	s	s	Z	s	s	Z	Z	s	Z	s

Table A3.3.4: Omission of plural inflection in short-stemmed regulars: advanced participants: SR phase

participant ID	proficiency level	owls (5.5)	mines (8.1)	silks (8.2)	gulps (11.5)	lamps (14.4)	monks (20.2)	belts (21.2)	clowns (21.6)	tents (23.1)	files (27.3)
IK1	UI	∅	z	∅	∅	s	s	s	z	s	z
IK2	LI	-	z	-	-	-	s	s	z	-	∅
IK3	LI	∅	-	∅	-	∅	∅	∅	z	s	z
IK4	LI	z	∅	-	-	-	∅	s	z	s	z
IK5	UI	z	z	∅	-	-	s	s	z	s	z
IK6	LI	z	z	∅	s	-	s	∅	∅	∅	∅
IK7	LI	-	z	∅	-	s	s	-	z	s	-
IK8	LI	z	z	s	s	-	s	s	z	s	z
IK9	UI	z	z	s	-	-	s	s	z	s	z
IK10	UI	z	z	-	s	-	s	-	z	-	-
IK11	UI	z	-	∅	∅	-	s	-	z	-	-
IK12	UI	-	z	s	-	s	s	s	-	s	-
IK13	LI	z	z	∅	-	-	s	s	z	s	-
IK14	LI	-	-	∅	-	s	s	∅	z	s	z

Table A3.3.5: Omission of plural inflection in long-stemmed regulars: intermediate participants: EI phase

participant ID	proficiency level	owls (5.5)	mines (8.1)	silks (8.2)	gulps (11.5)	lamps (14.4)	monks (20.2)	belts (21.2)	clowns (21.6)	tents (23.1)	files (27.3)
IK1	UI	z	z	s	s	s	s	s	z	s	z
IK2	LI	z	z	∅	-	s	s	s	z	s	z
IK3	LI	∅	∅	∅	∅	-	s	s	z	s	z
IK4	LI	z	∅	s	-	s	s	s	z	s	z
IK5	UI	∅	z	∅	∅	∅	s	s	z	s	z
IK6	LI	∅	z	∅	∅	∅	s	s	∅	∅	z
IK7	LI	z	z	∅	∅	s	s	s	z	s	∅
IK8	LI	z	z	s	s	s	s	s	z	s	z
IK9	UI	z	z	s	-	∅	s	s	z	s	z
IK10	UI	z	z	-	s	s	s	s	z	-	z
IK11	UI	z	-	∅	s	s	s	s	z	s	z
IK12	UI	z	z	s	∅	s	s	s	∅	s	z
IK13	LI	∅	z	∅	∅	∅	s	s	z	s	z
IK14	LI	∅	z	∅	-	∅	∅	s	∅	s	∅

Table A3.3.6: Omission of plural inflection in long-stemmed regulars: intermediate participants: SR phase

participant ID	proficiency level	owls (5.5)	mines (8.1)	silks (8.2)	gulps (11.5)	lamps (14.4)	monks (20.2)	belts (21.2)	clowns (21.6)	tents (23.1)	files (27.3)
AK1	UA	z	z	s	s	s	s	s	z	s	z
AK2	LA	-	z	s	s	s	s	s	z	s	z
AK3	LA	-	z	s	s	-	s	s	z	-	z
AK4	LA	z	z	s	s	-	s	s	z	s	z
AK5	LA	z	z	s	s	s	s	∅	z	s	z
AK6	LA	z	z	-	∅	-	s	s	z	s	z
AK7	LA	z	z	s	s	-	s	s	z	s	-
AK8	LA	z	-	s	-	-	s	s	z	s	z
AK9	LA	-	z	s	s	-	s	s	z	s	z
AK10	UA	z	z	s	s	-	-	s	-	s	z
AK11	LA	z	z	s	s	s	∅	s	z	s	z
AK12	LA	z	z	s	-	s	s	s	∅	s	-
AK13	UA	z	z	s	s	-	s	s	z	s	z
AK14	UA	z	z	s	s	-	-	s	z	s	z

Table A3.3.7: Omission of plural inflection in long-stemmed regulars: advanced participants: EI phase

participant ID	proficiency level	owls (5.5)	mines (8.1)	silks (8.2)	gulps (11.5)	lamps (14.4)	monks (20.2)	belts (21.2)	clowns (21.6)	tents (23.1)	files (27.3)
AK1	UA	z	z	s	s	s	s	s	z	s	z
AK2	LA	z	z	s	s	s	s	s	z	s	z
AK3	LA	z	z	s	∅	s	s	s	∅	s	z
AK4	LA	z	z	s	s	s	s	s	z	s	z
AK5	LA	z	z	s	s	s	s	s	z	s	z
AK6	LA	z	z	-	∅	-	s	s	z	s	z
AK7	LA	z	z	s	s	∅	s	s	z	s	z
AK8	LA	z	z	s	∅	s	s	s	z	s	z
AK9	LA	z	z	s	s	s	s	s	z	s	z
AK10	UA	z	z	s	s	s	s	s	z	s	z
AK11	LA	z	z	s	s	∅	s	s	z	s	z
AK12	LA	z	z	s	s	s	s	s	z	s	z
AK13	UA	z	z	s	s	s	s	s	z	s	z
AK14	UA	z	z	s	s	s	s	s	z	s	z

Table A3.3.8: Omission of plural inflection in long-stemmed regulars: advanced participants: SR phase

Appendix 4.1. Data sets for experiment 3

participant ID	proficiency level	EI							SR						
		kids (7.6)	hats (8.5)	frocks (8.5)	nuts (11.2)	plums (12.2)	flags (16.1)	wigs (26.2)	kids (7.6)	hats (8.5)	frocks (8.5)	nuts (11.2)	plums (12.2)	flags (16.1)	wigs (26.2)
IK1	UI	-	s	-	s	z	∅	-	z	s	s	s	∅	∅	-
IK2	LI	z	s	s	s	z	∅	-	z	s	s	s	∅	∅	-
IK3	LI	-	-	-	s	-	-	-	∅	s	s	s	-	z	z
IK4	LI	z	∅	-	s	z	-	z	z	s	s	s	z	z	z
IK5	UI	z	s	s	s	z	z	-	∅	s	s	s	z	∅	-
IK6	LI	z	∅	s	s	∅	-	z	z	∅	s	s	-	∅	z
IK7	LI	z	-	∅	s	-	z	-	∅	∅	∅	s	∅	∅	∅
IK8	LI	-	-	-	s	z	∅	z	∅	∅	∅	s	∅	∅	∅
IK9	UI	z	s	-	s	z	z	z	z	s	s	s	z	z	z
IK10	UI	z	s	s	s	z	∅	z	z	s	∅	s	z	z	z
IK11	UI	z	s	∅	s	∅	z	-	z	s	∅	s	∅	∅	-
IK12	UI	z	s	-	s	z	∅	z	z	s	s	s	z	∅	z
IK13	LI	-	∅	-	s	z	∅	∅	z	∅	s	s	z	∅	z
IK14	LI	z	∅	∅	-	∅	-	z	z	s	∅	s	∅	∅	∅

Table A4.1.1: Omission of plural inflection in N-pl QPs: intermediate participants

participant ID	proficiency level	EI							SR						
		some cans (2.4)	some mops (3.3)	some pigs (5.5)	some socks (7.4)	some sacks (20.7)	some bags (21.1)	some pups (24.5)	some cans (2.4)	some mops (3.3)	some pigs (5.5)	some socks (7.4)	some sacks (20.7)	some bags (21.1)	some pups (24.5)
IK1	UI	∅	s	z	s	s	-	s	∅	s	z	s	∅	z	s
IK2	LI	z	s	∅	s	s	z	s	z	s	z	s	∅	z	s
IK3	LI	-	s	∅	s	∅	z	s	∅	s	z	∅	∅	z	s
IK4	LI	∅	s	z	s	s	-	s	∅	s	z	s	s	z	s
IK5	UI	z	s	z	s	s	z	∅	∅	s	z	s	s	z	s
IK6	LI	∅	s	z	s	s	∅	s	∅	s	∅	s	s	∅	s
IK7	LI	-	s	z	s	-	∅	-	z	s	z	s	s	z	s
IK8	LI	z	s	-	s	s	-	s	∅	s	z	s	s	z	s
IK9	UI	-	s	-	s	∅	-	s	∅	s	z	s	∅	z	s
IK10	UI	z	s	z	s	s	z	s	z	s	z	s	∅	z	s
IK11	UI	-	s	z	-	∅	-	s	z	s	z	s	∅	z	s
IK12	UI	-	s	z	s	s	-	s	z	s	z	s	s	z	s
IK13	LI	-	s	z	s	∅	z	s	∅	s	∅	s	∅	z	s
IK14	LI	∅	s	-	s	s	∅	s	z	s	z	∅	∅	∅	∅

Table A4.1.2: Omission of plural inflection in ‘some’ + N-pl QPs: intermediate participants

participant ID	proficiency level	EI							SR						
		three locks (3.2)	seven ducks (3.4)	five crabs (4.4)	nine hens (5.4)	eight bells (14.4)	four pens (21.2)	two cups (26.3)	three locks (3.2)	seven ducks (3.4)	five crabs (4.4)	nine hens (5.4)	eight bells (14.4)	four pens (21.2)	two cups (26.3)
IK1	UI	-	s	z	z	z	z	s	∅	s	z	z	z	z	s
IK2	LI	s	s	z	z	∅	z	s	s	s	z	z	∅	z	s
IK3	LI	s	s	z	z	-	∅	s	s	s	z	z	∅	z	s
IK4	LI	s	s	∅	∅	-	z	s	s	s	z	z	∅	z	s
IK5	UI	s	s	z	z	z	z	s	s	s	z	z	z	z	s
IK6	LI	s	s	z	z	z	z	s	-	s	∅	z	∅	∅	∅
IK7	LI	s	-	z	-	-	z	s	s	s	z	∅	z	z	s
IK8	LI	s	s	z	z	z	z	s	s	s	z	z	z	z	s
IK9	UI	s	s	z	z	-	z	s	s	s	z	z	z	z	∅
IK10	UI	s	s	z	z	z	z	-	s	s	z	z	∅	z	s
IK11	UI	s	s	-	z	-	z	s	s	s	z	z	z	z	s
IK12	UI	s	s	z	z	z	z	s	s	s	z	z	z	z	s
IK13	LI	s	s	z	z	z	z	-	s	s	z	z	∅	z	∅
IK14	LI	s	s	∅	∅	-	∅	∅	s	s	z	z	z	∅	s

Table A4.1.3: Omission of plural inflection in Numl + N-pl QPs: intermediate participants

participant ID	proficiency level	EI							SR						
		eight fancy new zips (2.3)	nine heavy brown logs (12.5)	six scary long guns (13.3)	two happy young vets (15.4)	ten tiny white buns (17.2)	seven hungry green frogs (26.7)	five dusty thick maps (27.2)	eight fancy new zips (2.3)	nine heavy brown logs (12.5)	six scary long guns (13.3)	two happy young vets (15.4)	ten tiny white buns (17.2)	seven hungry green frogs (26.7)	five dusty thick maps (27.2)
IK1	UI	s	z	z	s	z	z	s	s	z	∅	s	z	z	s
IK2	LI	s	z	z	s	z	∅	-	s	∅	z	s	z	z	s
IK3	LI	∅	z	z	s	z	z	∅	∅	z	∅	∅	z	z	∅
IK4	LI	∅	z	∅	s	z	z	s	∅	∅	∅	∅	∅	∅	∅
IK5	UI	s	z	∅	s	z	z	∅	∅	z	∅	s	z	z	s
IK6	LI	s	∅	∅	∅	z	z	s	∅	∅	∅	∅	z	z	∅
IK7	LI	s	∅	z	∅	-	z	s	s	z	∅	∅	z	∅	∅
IK8	LI	s	-	∅	-	z	z	s	s	z	∅	∅	z	∅	s
IK9	UI	s	z	∅	s	z	z	s	s	z	∅	∅	z	z	∅
IK10	UI	s	z	z	s	z	z	s	s	z	z	s	z	z	s
IK11	UI	∅	z	∅	-	z	∅	s	∅	z	∅	s	z	∅	s
IK12	UI	∅	z	z	-	z	z	s	s	∅	z	s	z	∅	s
IK13	LI	∅	z	∅	∅	z	z	∅	∅	z	∅	∅	z	z	∅
IK14	LI	s	-	z	∅	∅	z	-	∅	∅	∅	∅	∅	∅	∅

Table A4.1.4: Omission of plural inflection in Numl + Adj + Adj + N-pl QPs: intermediate participants

participant ID	proficiency level	EI							SR						
		kids (7.6)	hats (8.5)	frocks (8.5)	nuts (11.2)	plums (12.2)	flags (16.1)	wigs (26.2)	kids (7.6)	hats (8.5)	frocks (8.5)	nuts (11.2)	plums (12.2)	flags (16.1)	wigs (26.2)
AK1	UA	z	s	s	s	z	∅	z	z	s	s	s	z	z	∅
AK2	LA	z	s	s	s	z	z	-	∅	s	s	s	∅	∅	-
AK3	LA	z	s	s	s	z	z	z	z	s	s	s	z	z	z
AK4	LA	z	s	-	s	z	z	∅	z	s	s	s	z	z	∅
AK5	LA	z	s	s	s	z	z	z	z	∅	s	s	∅	z	z
AK6	LA	z	s	s	s	z	-	z	z	s	s	s	z	-	z
AK7	LA	z	s	s	s	∅	z	z	z	s	s	s	z	z	-
AK8	LA	z	s	s	s	z	z	z	z	s	s	s	z	∅	z
AK9	LA	z	s	s	s	z	z	z	z	s	s	s	z	z	z
AK10	UA	z	s	s	s	z	z	z	z	s	s	s	z	z	z
AK11	LA	z	s	s	s	z	-	z	∅	s	s	s	z	∅	∅
AK12	LA	z	s	s	s	z	∅	-	-	s	s	s	-	-	-
AK13	UA	z	s	s	s	z	z	z	z	s	s	s	z	z	z
AK14	UA	z	s	s	s	z	z	∅	z	s	s	s	z	z	z

Table A4.1.5: Omission of plural inflection in N-pl QPs: advanced participants

participant ID	proficiency level	EI							SR						
		some cans (2.4)	some mops (3.3)	some pigs (5.5)	some socks (7.4)	some sacks (20.7)	some bags (21.1)	some pups (24.5)	some cans (2.4)	some mops (3.3)	some pigs (5.5)	some socks (7.4)	some sacks (20.7)	some bags (21.1)	some pups (24.5)
AK1	UA	z	s	z	s	s	z	s	z	s	z	s	s	z	s
AK2	LA	z	s	z	s	s	-	s	z	s	z	s	s	z	s
AK3	LA	-	-	-	s	-	-	s	z	s	z	s	∅	z	s
AK4	LA	z	s	z	s	∅	z	s	z	s	z	s	∅	z	s
AK5	LA	z	s	z	s	s	z	s	z	s	z	s	s	z	s
AK6	LA	∅	s	z	s	s	-	s	z	s	z	s	s	∅	s
AK7	LA	∅	-	-	s	∅	z	s	∅	s	z	s	s	z	s
AK8	LA	z	s	z	s	s	z	s	z	s	z	s	s	z	s
AK9	LA	z	s	z	s	s	z	s	z	s	z	s	s	z	s
AK10	UA	z	s	z	s	s	z	s	z	s	z	s	s	z	s
AK11	LA	z	s	z	s	s	-	s	z	s	z	s	s	z	s
AK12	LA	z	-	-	s	s	z	s	z	s	z	s	-	z	s
AK13	UA	z	s	z	s	-	z	s	z	s	z	s	s	z	s
AK14	UA	z	s	z	s	s	z	s	z	s	z	s	s	z	s

Table A4.1.6: Omission of plural inflection in ‘some’ + N-pl QPs: advanced participants

participant ID	proficiency level	EI							SR						
		three locks (3.2)	seven ducks (3.4)	five crabs (4.4)	nine hens (5.4)	eight bells (14.4)	four pens (21.2)	two cups (26.3)	three locks (3.2)	seven ducks (3.4)	five crabs (4.4)	nine hens (5.4)	eight bells (14.4)	four pens (21.2)	two cups (26.3)
AK1	UA	s	s	z	-	∅	z	s	s	s	z	z	z	z	s
AK2	LA	s	s	z	z	z	z	∅	s	s	z	z	z	z	s
AK3	LA	s	s	z	z	-	z	s	s	s	∅	z	z	z	s
AK4	LA	s	s	z	z	-	z	s	s	s	z	z	z	z	s
AK5	LA	s	s	z	z	z	-	s	s	s	z	z	z	z	s
AK6	LA	s	s	z	z	-	z	s	s	s	z	z	z	z	s
AK7	LA	s	s	∅	-	z	z	s	s	s	z	z	z	z	s
AK8	LA	s	s	z	z	-	z	-	s	s	z	z	z	z	s
AK9	LA	s	s	z	z	-	z	s	s	s	z	z	z	z	s
AK10	UA	s	s	z	z	-	z	s	s	s	z	z	z	z	s
AK11	LA	s	s	z	s	z	z	s	s	s	z	z	z	z	s
AK12	LA	s	s	z	z	z	z	s	s	s	z	z	z	z	s
AK13	UA	s	s	z	z	z	z	s	s	s	z	z	z	z	s
AK14	UA	s	s	z	z	z	z	s	s	s	z	z	z	z	s

Table A4.1.7: Omission of plural inflection in Numl + N-pl QPs: advanced participants

participant ID	proficiency level	EI							SR						
		eight fancy new zips (2.3)	nine heavy brown logs (12.5)	six scary long guns (13.3)	two happy young vets (15.4)	ten tiny white buns (17.2)	seven hungry green frogs (26.7)	five dusty thick maps (27.2)	eight fancy new zips (2.3)	nine heavy brown logs (12.5)	six scary long guns (13.3)	two happy young vets (15.4)	ten tiny white buns (17.2)	seven hungry green frogs (26.7)	five dusty thick maps (27.2)
AK1	UA	∅	z	z	s	z	z	s	s	z	z	s	z	z	s
AK2	LA	s	z	z	s	z	z	∅	s	z	∅	s	z	z	∅
AK3	LA	s	z	z	s	z	z	-	s	z	z	s	z	z	∅
AK4	LA	s	z	z	s	z	z	s	s	z	z	s	z	z	s
AK5	LA	s	z	z	s	z	z	s	s	z	∅	s	z	z	s
AK6	LA	s	z	z	s	z	z	-	s	z	∅	s	z	z	s
AK7	LA	∅	z	z	s	z	z	s	∅	z	z	s	z	z	s
AK8	LA	s	z	-	s	z	z	s	s	z	z	∅	z	∅	s
AK9	LA	s	z	z	s	z	z	s	s	z	z	s	z	z	s
AK10	UA	s	z	z	s	z	z	s	s	z	z	s	z	z	s
AK11	LA	s	z	∅	s	z	z	s	s	z	∅	s	z	z	s
AK12	LA	s	z	-	s	z	z	s	s	z	∅	s	z	∅	s
AK13	UA	s	z	z	s	z	z	s	s	z	z	s	z	z	s
AK14	UA	s	z	z	s	z	z	s	s	z	z	s	z	z	s

Table A4.1.8: Omission of plural inflection in Numl + Adj + Adj + Numl + N-pl QPs: advanced participants