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Is the Suppliance of L2 Inflectional Morphology Subject to Covert Contrasts? An Analysis of the Production of L2 English Third Person Singular Agreement by L1 Bengali Speakers

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Abstract: The cause(s) of missing inflectional morphology in obligatory contexts by adult speakers of second language (L2) English is subject to ongoing discussion. Whatever the specific theory, however, the apparent asymmetrical production of the morpheme '-s' in the marking of number on plural nouns versus that on third person singular agreement has to be accounted for. This study adopts the theoretical approach put forward by the Prosodic Transfer Hypothesis, whereby the prosodic representation of inflectional morphology in the first language (L1) can, to some extent, account for differences in the suppliance of inflectional morphology in L2 English within and across L1s. It is in this context that the production of third person singular agreement, and, for contrastive purposes, number on plural nouns, by L1 Bengali speakers of L2 English, is considered in relation to available prosodic representation in the L1, as well as against phonological processes attested in L1 acquisition. More specifically, with respect to covert contrasts. An inspection of spectrograms from instances of the apparent omission of inflection by L1 Bengali speakers of L2 English at Beginner to Intermediate proficiency levels does not, however, indicate that learners are covertly supplying agreement on the third person singular (or plural number on nouns). This finding does not necessarily rule out the occurrence of covert contrasts in L2 production of inflectional morphology; alternative techniques may detect a systematic difference between bare verbs and non-audible (to the listener) inflection.

Keywords: Bengali; prosodic representation; inflectional morphology; covert contrasts

1. Introduction

Variable spoken production of inflectional morphology (e.g., tense, number, and agreement) and functional categories (e.g., auxiliaries, and determiners) is well documented in adult second language acquisition studies (see, for example, Gass 2013; Goad et al. 2003; Lardiere 2007; White 2009; Slabakova 2016; Goad and White 2019). Typical omission of required inflectional morphology, as shown by the crossed-out morphemes in (1), include the omission of (a) simple past tense, (b) third person agreement, and (c) plural number on nouns.

(1)
(a) Last night I **boiled** rice.
(b) He always **watches** television after school.
(c) There are three **dogs**.

A seemingly common characteristic in the acquisition of L2 inflectional morphology is the disparity or dissociation between spoken production and the underlying knowledge of the required functional morphology (White 2003; Hawkins and Liszka 2003; Campos Dintrans 2011; Cabrelli Amaro et al. 2018). This can be attributed to different factors. The Prosodic Transfer Hypothesis (PTH) (Goad et al. 2003; Goad and White 2004, 2006, et seq.) proposes that instances of missing inflection (and function words) can be traced (at least in part) to differences in the prosodic representation of functional morphology between the L1 and L2. On this view, the causes of omission are attributed to the prosodic representation of morphology in the L1 versus the representational requirements of the

L2. This is in contrast to other L1-centred theories, which include pinpointing difficulties in, for example, the reassembly of features in the L1 and L2 (e.g., Lardiere 2008) or in mapping between L2 syntactic representation and surface morphology (e.g., Prévost and White 2000; Nguyen and Newton 2022), and also in contrast to theoretical frameworks that argue for a representational deficit in syntactic representation, such as the unavailability of uninterpretable features outside the L1 (e.g., Hawkins and Chan 1997; Hawkins and Liszka 2003).

In L1 acquisition, Macken and Barton (1980) presented a seminal longitudinal study of the acquisition of voicing contrast in word-initial stops (e.g., /p/ versus /b/ initial words), measuring voice onset time (VOT). They found that four L1 American English-speaking children acquired voicing contrasts over three stages: (i) no contrast, (ii) a contrast that is not perceivable by L1 adult listeners, and (iii) target-like contrast. Stage (ii) is of particular interest because although the children were systematic in the production of a VOT contrast between voiced and unvoiced stops, this was not perceived by the adult listener. The significantly reliable difference in VOT values produced by the children fell on the same side of the (voiced) boundary for the adult listeners and were thus imperceptible in VOT contrast. Stage (ii) marks the attestation of covert contrasts (in comparison to overt contrasts); the systematic but non-target like difference in production of a sound by L1 child speakers, and, concurrently, the inability of L1 adult listeners in perceiving such contrast. This paper is concerned with both the issue of missing inflection in L2 English by L2 adult speakers, and the potential role of covert contrasts in identifying why some inflectional morphemes appear to be more robustly omitted than others.

Background to the Current Study

The L1 under examination in this study is Bengali, an under-researched language in L2 acquisition studies, and more specifically, in the study of the acquisition of L2 inflectional morphology. Bengali (also widely referred to as Bangla) is the official and national language of the People's Republic of Bangladesh, and also the state language of West Bengal, Tripura, and Assam in the Republic of India. The participants in this study speak Bangladeshi Standard Bengali (Khan 2008, p. 17), also known as Dhaka Colloquial Bengali (Boyle David 2015, p. 9)[1]. With a distinction between a 'high' written versus spoken form, Bengali is a diglossic language, and this is instrumental in the analysis of modern day spoken inflectional morphology, in, for example, in the context of vowel alternations, which would otherwise lack transparency (see, for example, Lahiri 2000). Typologically, Bengali is agglutinating with some fusional elements (e.g., Boyle David 2015), and with a clear order of suffixation (i.e., root-aspect-tense-person). Bengali verbs are categorised into six or seven classes according to the phonological shape of the stem, and inflectional patterns are regular within the verb class.

The current study is an exploratory extension which has emerged from two previous studies on the potential phonological causes of missing inflection in the spoken production of L2 English by L1 Bengali speakers. Ingham (2019, 2022) examined the effects of L1 transfer of minimal word constraints, as well as L1 moraic structure, within the context of L1 transfer of prosodic representation of inflectional morphology, as put forward by the PTH. This was investigated with a main focus on the suppliance of L2 English simple past tense by L1 Bengali speakers via an elicited semi-spontaneous spoken production task. It was proposed that alongside availability of the required prosodic representation in the L1 for L2 inflectional morphology, sensitivity to L2 vowel length and L1 coda constraints may also influence L2 suppliance rates; adding an extra layer of complexity alongside the phonological factors attributed to the transfer of L1 prosodic representation and prosodic requirements of the L2. In this respect, a mismatch between the L1 and L2 regarding word minimality may have to be addressed before inflection can be attached to a prosodic word (PWd) in the L2.

Although the focus was on the past tense, data were also collected from, for example, the production of consonant clusters in monomorphemic forms and other inflectional

morphemes, including third person singular agreement (Ingham 2019). The current study was instigated by a reconsideration of third person singular agreement data and the marking of plural number on nouns; comparative data collected for the primary study (Ingham 2019). The data show an asymmetry in the production of plural number marking on nouns compared to that on third person singular agreement, from Beginner through to Intermediate proficiency levels (Ingham 2019). The question under consideration in this paper, then, is how this asymmetry in suppliance of third person singular agreement and the marking of plural number on nouns can be explained, and whether this can be accommodated within the findings discussed in Ingham (2019, 2022) and within the framework of the PTH. In other words, as third person singular agreement and the marking of plural number on nouns share the same prosodic representation, this asymmetry in production poses a potential challenge to the PTH[2]. One possible explanation compatible with the PTH, and which is explored in this paper, is that (some) L2 speakers differentiate between an inflected third person singular verb and a non-inflected verb, but that the articulation of covertly inflected third person agreement is not audible to the native speaker listener. That is, a potential covert contrast may mark the suppliance of third person singular agreement. In contrast, the apparent absence of a reciprocal covert contrast on the marking of number (i.e., in relation to low incidences of non-inflected versus inflected nouns) could be related to the sentential position of the verb and noun (typically utterance-medial and utterance-final respectively). The research question for the current study is set out in (2).
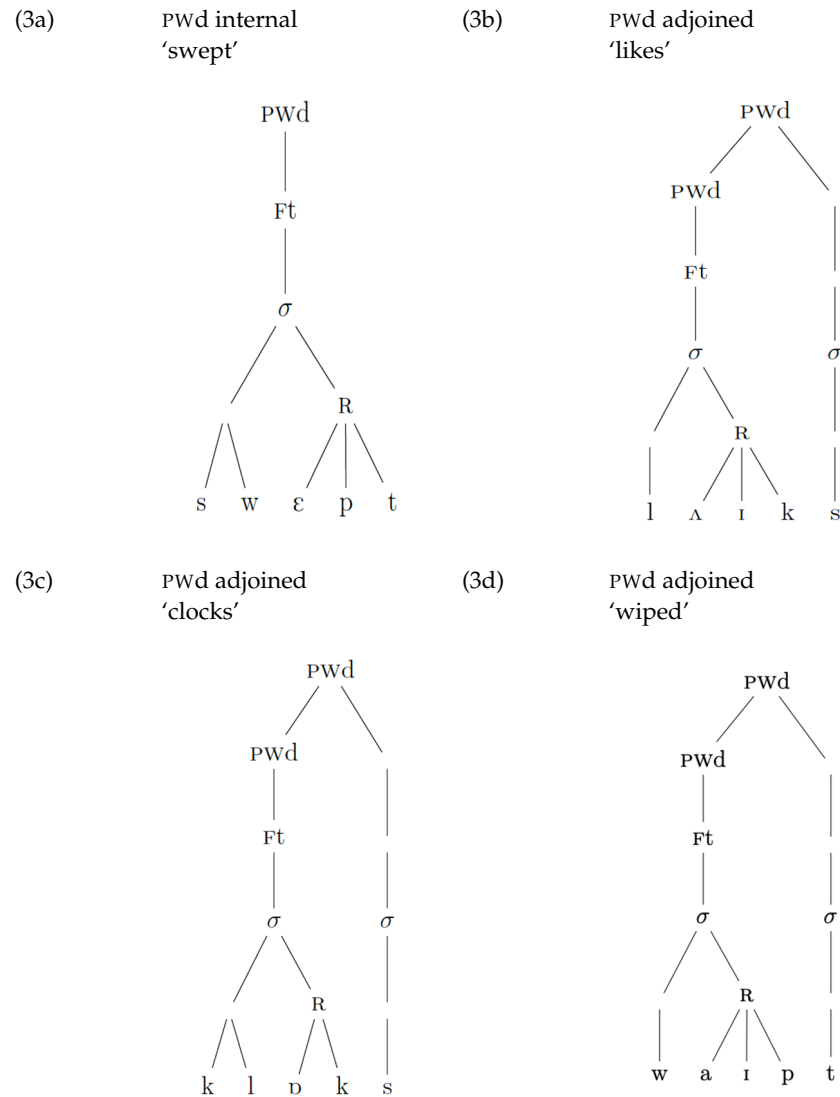
> (2) Do adult L1 Bengali speakers of L2 English show evidence of covert contrasts in cases where obligatory third person agreement appears to be omitted?

Set under the umbrella of prosodic transfer to account for the suppliance of L2 inflectional morphology, this paper proceeds with a brief review of the PTH in relation to the availability and adaptation of the required prosodic representation in English, with an analysis of the differences between the L1 (Bengali) and L2 (English). A review of the prosodic representations available to L1 Bengali speakers, and the availability of structures required to supply inflectional morphology in L2 English, follows. Having established the potential availability of the required prosodic representation for the production of L2 English inflectional morphology by L1 Bengali speakers, attention turns to the difficulties learners appear to encounter in the suppliance of third person singular agreement compared with plural number on nouns, and findings from previous studies from a PTH perspective on the suppliance of third person singular agreement and plural number on nouns are also considered. Following this, some of the literature on covert contrasts in L1 acquisition, as well as the application of this approach in the context of L2 studies is discussed. Turning to the current study, the method and some of the production data are discussed in relation to covert contrasts with reference to spectrogram data from two participants from a small group of L1 Bengali speakers of L2 English. The paper concludes with a discussion regarding whether covert contrasts can help explain the delay in the production of the morpheme '-s' in the suppliance of third person agreement compared to that of plural number on nouns.

2. A Brief Introduction and Comparison of Bengali and English Prosodic Representation

2.1. Prosodic Representation of English Number and Agreement

PTH differentiates between inflectional morphology which is incorporated into the prosodic word, and that which is attached externally to the prosodic word. It is proposed that English irregular past tense inflection is represented internal to the prosodic word (see, for example, Goad et al. 2003; Goad and White 2006). This is illustrated here with the irregular past form of 'sweep' ('swept') in (3a). In contrast, third person singular agreement, plural number on nouns, and regular simple past tense attach to the prosodic word (see, for example, Goad et al. 2003; Goad and White 2006). This is illustrated in (3b) with the third person singular agreement form 'like-s', (3c) plural number on nouns in 'clock-s', and (3d) regular simple past 'wip-ed'.

(3a)   PWd internal
        'swept'

(3b)   PWd adjoined
        'likes'

```
        PWd                              PWd
         |                              /    \
        Ft                           PWd      \
         |                            |         \
         σ                           Ft          \
        / \                           |            \
       /   R                          σ            σ
      / \ /|\                        / \           |
     s w ε p t                      /   R          |
                                   l  ʌ ɪ k       s
```

(3c)   PWd adjoined
        'clocks'

(3d)   PWd adjoined
        'wiped'

```
         PWd                             PWd
        /    \                          /    \
     PWd      \                      PWd      \
      |         \                     |         \
     Ft          \                   Ft          \
      |            \                   |            \
      σ            σ                   σ            σ
     / \           |                  / \           |
    /   R          |                 /   R          |
   / \ /|\         |                /   /|\         |
  k l ɒ k         s               w  a ɪ p        t
```

Thus, whilst the irregular (pseudo-inflected) past form is incorporated into the PWd, third person singular agreement '-s', regular plural noun morpheme '-s' and regular simple past '-ed' are adjoined to the stem by a higher PWd and are not internal to the lower PWd. The background to this analysis centres on the number of segments that are permitted in word-final rhymes; a maximally ternary rhyme is arguably permissible in word-final position (Goad et al. 2003; Goad and White 2006, 2008, 2019). English monomorphemic words conform to this constraint, permitting word-final VCC or VVC sequences, illustrated in (4) and (5) respectively. The addition of Class I derivational suffixes triggers vowel shortening to ensure the constraint on the number of segments is not violated (6). Examples (4) to (6) are reproduced from Goad and White (2019, p. 777).

(4)   a.   [hɛlm] 'helm'
        b.   [hɛmp] 'hemp'
        c.   *[hɛlmp]

(5)   a.   [rijm] 'ream'
        b.   [rijp] 'reap'
        c.   *[rijmp]

(6)   a.   [dijp] 'deep'
        b.   [dɛpθ] 'depth'
        c.   *[dijpθ]

Goad and White (2019) argue that irregular verbs in the past tense also conform to the maximal ternary rhyme restriction, forcing vowel shortening in the inflected form, for example, in 'keep' to 'kept', as shown in (7)[3].

(7) a. [ki:p] 'keep'
     b. [kɛpt] 'kept'
     c. *[ki:pt]

With respect to L2 acquisition, and in accordance with the PTH, omission of obligatory L2 inflectional morphology can be attributed to the differences in how inflectional morphology is represented in the L1 in comparison to the L2. In the absence of L1 representation of inflectional morphology, for example, in a strongly analytic language such as Mandarin, the L2 learner of English is arguably tasked with an extra layer of complexity, as the required L2 representation must either be acquired or constructed. Thus, L2 production of third person agreement and regular plural morphology is essentially dependent upon the availability of the required prosodic representations in the L1. If, for example, the L1 prosodifies inflectional material internal to the PWd, or adjoins material to the left edge but not the right edge of the PWd, then the learner has to first (re)construct the required L2 PWd adjoined structure (e.g., Goad and White 2006; White 2008). Alternatively, if the required prosodic structure is available but not in the representation of agreement and number, then the prosodic structure must be relicensed to a new position (e.g., Goad and White 2006, 2019). Whilst the exact prosodic representation may not be readily available in the L1 or for the same form, this is not insurmountable if the required prosodic representation can either be manipulated from existing representations or adapted to permit different types of inflectional morphology to adjoin.

2.2. PTH and L2 English Production of Plural Number and Third Person Singular Agreement: Some Previous Studies

English third person singular agreement '-s' and the plural noun marker '-s' have the same shape, they share the same phonological features, and both require a PWd adjoined prosodic representation. That is, the inflectional morpheme is attached externally to the PWd rather than represented internally within the PWd. It might be expected, therefore, that instances of suppliance (and conversely omission) might be fairly commensurate in L2 production of third person singular agreement and regular plual morphology. Indeed, this is exactly what White (2008, p. 311) predicts.

Comparing high Intermediate to low Advanced L1 French and L1 Mandarin speakers, White (2008) reports that in an elicited production experiment, third person singular agreement morphology was supplied in 60% of obligatory contexts by L1 French speakers, compared to the suppliance of plural marking on nouns at ceiling (100%). Similarly, White (2008) illustrates that the same pattern was found across L1 Mandarin speakers, who showed a greater suppliance of plural morphology (93%) compared to just 31% of third person singular morphology in obligatory contexts. Also, in an elicited production experiment, Ingham (2019) found statistically significant differences in the spoken suppliance of obligatory plural marking on nouns (pl) compared to that on third person singular agreement (3 sg) by L1 Bengali speakers of L2 English. Across 28 participants at a range of proficiency levels, it was found that, at Beginner proficiency level ($n = 7$), suppliance of inflection was greater on plurals nouns than third person agreement (0.44 pl, 0.08 3 sg $p = 0.001$). This pattern was repeated at Elementary proficiency level ($n = 8$) (0.76 pl, 0.28 3 sg $p = 0.0005$) and at Intermediate proficiency level ($n = 8$) (0.95 pl, 0.57 3 sg $p = 0.001$). Only at Advanced proficiency level ($n = 5$) did statistical significance disappear (1.0 pl, 0.96 3 sg). This difference in the suppliance of obligatory inflectional morphology on third person singular agreement and plural number on nouns is not predicted by the PTH. However, by Advanced proficiency level, the L1 Bengali speakers appear to have mastered suppliance of L2 English third person singular agreement as well as plural number on nouns, and at Intermediate level, participants produce inflection on third person singular agreement
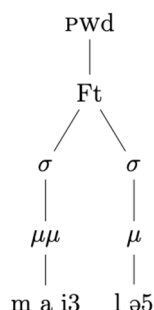
above chance. In the following section, we consider the role of L1 prosodic representation in relation to these suppliance rates.

2.3. Available Prosodic Representation in French and Mandarin for Required L2 English Representation of Third Person Singular Agreement and Plural Number on Noun

Since the proficiency level of participants in White's (2008) study is conflated between high Intermediate and low Advanced, and the elicited production tasks differ, direct comparison between the production data across the cited studies is not feasible. However, the patterns of production arguably also reflect a difference in the prosodic representations available in the L1. White (2008) proposes that inflection is represented internal to the PWd in both French and Mandarin, although French allows inflectional material to be attached to the left edge of the word, and that with some reconfiguration (and relicensing of inflectional material to the right edge of the word), French speakers may be able to accommodate the required L2 English prosodic representation for third person singular agreement and plural noun marking. Indeed, this appears to be a possible explanation for the overall higher dgree of suppliance of inflectional morphology reported for L1 French speakers compared to L1 Mandarin speakers (White 2008). As a strongly analytic and isolating language, there is arguably little evidence of inflectional morphology in Mandarin. However, Goad et al. (2003, p. 252) and Goad and White (2006, p. 248) propose that the Mandarin perfective marker *-lə* is represented within a PWd internal prosodic representation, as illustrated in (8a) and (8b) with the perfective form of *mai3-lə5* 'bought already' (the tone-bearing bimoraic syllable is marked with tonal indicator 3 and neutral monomoraic morpheme *-lə* 5)[4].
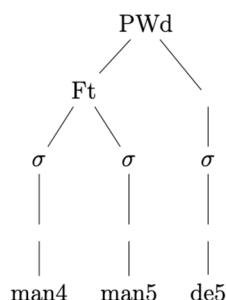
(8a)　(mai3—lə5)
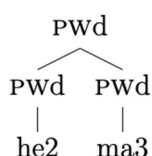　　　buy—PERF
　　　'bought already'

(8b)

To build the required PWd adjoined prosodic representation for L2 English third person singular agreement and plural number marking on nouns, Goad and White (2006) propose the adaptation of two exisiting L1 Mandarin structures and subsequent reassignment of the combined structure to a new syntactic construction (e.g., *man4 -man5 -de5* 'slowly' and *he2 -ma3* 'hippopotamus'). In these examples, the reduplication of adjectives allows the formation of an adverb of manner (*man4 -man5 -de5* 'slowly') with the rightmost syllable prosodified outside the foot, within the PWd. The lexical compound (*he2 -ma3* 'hippopotamus') is prosodically represented with a PWd dominating another PWd. This is illustrated in (8c) and (8d). Together, these stuctures allow the required English PWd adjoined representation, which must then be assigned to the appropriate English L2 forms[5].

(8c)

```
            PWd
           /    \
         Ft      \
        /  \      \
       σ    σ      σ
       |    |      |
       |    |      |
     man4 man5   de5
```

(8d)

```
        PWd
       /    \
     PWd    PWd
      |      |
     he2    ma3
```

Further investigation of Advanced proficiency level L1 French and L1 Mandarin speakers of L2 English may provide additional insight regarding whether the suppliance of third person singular agreement and plural noun marking reaches parity. There is, however, the added complexity in adult L2 acquisition in the potential for fossilisation in the domain of developing a target-like L2 inflectional morphology (e.g., White 2003). Indeed, Lardiere (2007) reports on a longitudinal study of L1 Mandarin speaker 'Patty' and the pervasive ommission of L2 English inflectional morphology, including third person singular agreement and plural number on nouns, despite residing in an English-speaking environment for a number of years, as illustrated in (9), reproduced from Lardiere (2007, p. 204).[6]

(9) a. because he *understand* a lot
    b. I borrow a lot of *book* from her

Should availability of the required L2 prosodic representation be on the right track, the comparison of the available prosodic representation for L1 Bengali speakers of English appears to provide further supporting evidence for the PTH. Furthermore, as will be illustrated in Section 3, the relative availability of the required prosodic representation for L2 English by L1 Bengali speakers may be able to help explain the near target-like suppliance rates of both third person singular agreement and plural number on nouns by L1 Bengali speakers at Advanced level, as well as the patterns of development through the lower proficiency levels, as reported in Section 2.2. There are, therefore, two lines of investigation. The first is the role of availability of prosodic representation in the L1 relative to the requirements of the L2 in the context of the suppliance of inflectional morphology, and the second is the developmental patterns in the suppliance of one type of inflectional morpheme over another, specifically when the morpheme remains constant in form ('-s' in the third person singular agreement and plural number on nouns). The available prosodic representations in L1 Bengali are discussed in the following section in order to address the first point, and the discussion then shifts to the phenomenon of covert contrasts, to set the background to the disparity between the suppliance of inflectional morphemes of the same form requiring the same representation.
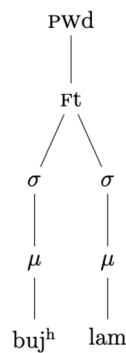
3. Bengali Prosodic Representation

It is proposed that inflectional material in Bengali is represented both PWd internally and PWd adjoined (Ingham 2019, 2022). This will be considered in relation to Bengali tense and person agreement, followed by Bengali plural noun agreement.

3.1. Prosodic Representation of Bengali Tense and Person Agreement

The PWd internal representation in Bengali is illustrated in (10) with the simple past form *bujʰlam* ('I understood'). The verb *bɔjʰa* has both a high and low vowel alternate (*bujʰ-* and *bɔjʰ-* respectively). The past tense is formed with the high vowel root *bujʰ-* with the past marker *-l-* and, in this example, the first person marker *-am.* The root vowel is raised to the high form with the inclusion of the inflectional markers *-l-* and *-am*. Whilst initially this seems contra to the phonological process of vowel raising, the explantion can be found in the diglossic origins and written form of Bengali, where an *-i-* marker (now largely 'invisible' in most spoken forms) forces the vowel to raise. This could be illustrated as an underlying affix which attaches as a prefix to the tense and person marker as in *-i-l-am*, triggering vowel raising to form *bujʰlam* 'I understood' (Bayer and Lahiri 1990; Lahiri 2000). Due to vowel raising, which must be internal to a PWd, it is proposed that simple past tense in Bengali is, therefore, a PWd internal representation.

(10)　*bujʰlam*　　　('I understood')

PWd
|
Ft
/ \
σ 　 σ
| 　 |
μ 　 μ
| 　 |
bujʰ 　 lam

The analysis for a PWd internal representation can be further illustrated with the positioning of the clitic *=o* ('also'), which cannot appear between the root, tense, and person affixes, and can only attach to a PWd (Fitzpatrick-Cole 1996; Bayer and Lahiri 1990), as shown in (11).
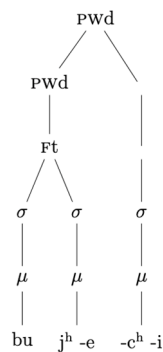
(11)

((bujʰ　　　-l　　-am)$_{PWd}$ =o)$_{PWd}$
understand -PST -1　　　=also

'I also understood'

*(bujʰ　　　=o　　-l　　-am)$_{PWd}$
understand =also -PST -1

'I also understood'

*(bujʰ　　　-l　　=o　　-am)$_{PWd}$
understand -PST =also -1

'I also understood'

The position of the clitic *=o* is only possible at a PWd boundary, further illustrating the absorption of the inflectional affixes within the PWd. The placement of the clitic can also help identify the Bengali PWd adjoined representation, which is required for the construction of the present perfect, as in the example *bujʰecʰi* ('I have understood'), shown in (12). The perfect affix */-e/* attaches internally to the root to create the perfect participle. This forms the base for the perfect marker */-cʰ-/* and first person marker */-i/*[7].

(12)

Again, the placement of the clitic =*o* in (13) illustrates the word formation processes at work[8]. The clitic =*o* can only appear at word boundaries and cannot be inserted within the root or within the suffixes representing aspect, tense, or person.

(13)

$((\text{buj}^h \quad -e)_{\text{PWd}} =o)_{\text{PWd}}$
understand -PRFP =also

'understood also'

$*((((\text{buj}^h \quad =o \quad -e)_{\text{PWd}}) -c^h \quad -\emptyset \quad -i)_{\text{STEM}})_{\text{PWd}}$
understand =also -PRF -PRF -PRS -1

'I have also understood'

$(((((\text{buj}^h \quad -e)_{\text{PWd}}) -c^h \quad -\emptyset \quad -i)_{\text{STEM}})_{\text{PWd}} =o)_{\text{PWd}}$
understand. PRF -PRF -PRS -1 =also

'I have also understood'

$(((((\text{buj}^h \quad -e)_{\text{PWd}} =o)_{\text{PWd}}) -c^h \quad -\emptyset \quad -i)_{\text{STEM}})_{\text{PWd}}$
understand. PRF =also -PRF -PRS -1

'I have also understood'

Under this account, it would appear that for L1 Bengali speakers of L2 English, the L1 Bengali PWd adjoined representation for present perfect suffixation can be readily applied (with minimal adaptation in terms of relicensing to a new structure in the L2) to that required for English third person singular agreement and plural number on nouns. Further evidence of the availability of the required L2 prosodic representations can be found in the marking of plural number on nouns in Bengali.

3.2. Prosodic Representation of Bengali Plural Noun Agreement

Unlike English regular plural noun marking, which requires a PWd adjoined prosodic representation, Bengali plural noun agreement can arguably be marked in both a PWd adjoined or PWd internal representation, depending upon the plural marker (Ingham 2019). Although there is considerable discussion on the classification of plural markers, including whether they should be considered to be clitics or affixes (see, for example, Boyle David 2015; Fitzpatrick-Cole 1996; Thompson 2012), one way to illustrate the flexibility of prosodic representation of plurality is with the plural markers -*ra* and -*era* versus -*gulo* and -*guli*. In this analysis, the plural markers -*ra* and -*era* are assumed to be affixes and combine with the noun stem in a PWd internal representation, as illustrated in (14), adapted from Fitzpatrick-Cole (1996, p. 310).

(14) $(((pak^hi)_{STEM} \text{ -ra})_{STEM})$ PWd
       bird $_{-PL}$
       '(the) birds'

Alternatively, the plural markers *-gulo* and *-guli* operate as classifiers ([Thompson 2012]) and are adjoined to the PWd, as shown in (15).

(15) $(((pak^hi)_{STEM})_{PWd} \text{ -gulo})$ PWd
       bird $_{-PL}$
       'the birds'

Either interpretation allows that the prosodic representation of plurality on nouns in Bengali is either readily available as a PWd adjoined representation (as required by English plurals), or requires relicensing to be allowed to adjoin the PWd, the prosodic representation of which is available to L1 Bengali speakers as illustrated in the construction of the present perfect tense, buj^hec^hi ('I have understood'), in (12) and (13).

3.3. Interim Summary

Considering the role of availability of prosodic representation in the L1 relative to the requirements of the L2 in the context of the suppliance of inflectional morphology (see Section 2.1), L1 Bengali speakers arguably have access to the required prosodic representation to produce L2 English third person singular agreement and plural noun morphology. Indeed, the Bengali language appears to have both the availability of the PWd adjoined representation and the licensing of both plural noun marking and person agreement on the right edge, so that L1 Bengali speakers of L2 English can be considered to share both the available and required structures. They are considerably better equipped than L1 Mandarin speakers in terms of the complexity of the task in supplying L2 English inflectional morphology in relation to availability of the required prosodic representation. Mandarin does not permit a PWd adjoined prosodic representation (see Section 2.3) and must combine structures to generate the representation required in the L2 ([Goad et al. 2003]; [Goad and White 2006]; [White 2008]). Whilst L1 French speakers of L2 English may require relicensing and some degree of reconfiguration of the available L1 prosodic representation (such as flipping the French PWd adjoined structure from the left to the right edge), this is arguably (in structural terms) to a lesser degree of complexity than the restructuring and relicensing required by L1 Mandarin speakers of L2 English in acquiring the required representations (see, for example, [White 2008]). Indeed, with reference to the findings (set out in Section 2.2) from [Ingham (2019)], and in loose comparison to those from [White (2008)] (set out in Section 2.2), L1 Bengali speakers at Advanced proficiency level appear to outperform the high Intermediate and low Advanced L1 Mandarin and L1 French speakers in the suppliance of third person singular agreement morphology. In relation to the developmental patterns of the suppliance of one type of inflectional morpheme over another, specifically when the morpheme remains constant in form (such as '-s' in the third person singular agreement and plural number on nouns), the focus now turns to an area of L1 acquisition, specifically covert contrasts, which may help explain the disparity reported in Section 2.2 between adult L2 suppliance rates of third person agreement compared to plural number on nouns.

4. Order of Child L1 Morpheme Acquisition Versus Adult L2 Acquisition Studies

There is, of course, much debate regarding the nature of child L1 and adult L2 acquisition (see, for example, the Fundamental Difference Hypothesis, [Bley-Vroman 1989], [2009]). In this section, the order of acquisition of inflectional morphology and the role of covert contrasts in child L1 and adult L2 acquisition are considered with respect to L2 acquisition of inflectional morphology.

4.1. Order of Acquisition of Inflectional Morphemes in L1 and L2 Acquisition

It is well documented that in the early 1970s, [Brown (1973)], in addressing the question of uniformity of morpheme acquisition in language development, logged the acquisition

order for 14 morphemes across three English-acquiring children[9]. Although there is some disagreement and controversy regarding the acquisition studies (see, for example, Long and Sato (1984) on the issues of methodological approaches and Goldschneider and DeKeyser (2005) for an overview of morpheme studies), Brown (1973) found that the plural morpheme '-s', marking number, was the third morpheme to be acquired. That is, after the child has acquired the present progressive '-ing' and prepositions, such as 'in'. Whilst irregular past was the fifth morpheme in the acquisition order, regular past '–ed' was not acquired until later (the ninth morpheme logged), followed by third person singular agreement '-s'. This is much later than acquisition of possessive '-s', which is acquired after irregular past (which is itself acquired after plural '-s'). There are a number of possible explanations for this order of acquisition (see Goldschneider and DeKeyser (2005) for a meta-analysis of some of key acquisition studies in relation to the determinants of perceptual salience, semantic complexity, morphophonological regularity, syntactic category, and frequency). Investigating whether L2 child acquisition would follow a different pattern of inflectional morpheme acquisition from L1 acquisition, Dulay and Burt (1973) examined the acquisition of eight morphemes by L1 Spanish and L1 Mandarin children. It was found that there were similarities in the acquisition order by the L2 learners, but the order differed from that reported in L1 acquisition by Brown (1973). At the same time, although the acquisition order varied between Brown's (1973) and Dulay and Burt's (1973) studies, plural '-s' still preceded third person singular '-s', but possessive '-s' was acquired later by the L2 learners (following third person singular agreement) compared to earlier L1 acquisition. Nguyen and Newton (2022) found that acquisition of third person singular agreement by Vietnamese English as a Foreign Language (EFL) university students lagged behind that of copula 'be', supporting the English-acquiring child L1 order of acquisition. However, based on written output, Murakami and Alexopoulou (2016) propose that the order and accuracy of acquisition for L2 morphemes is directly linked to L1 influence rather than a universal order of acquisition. A relevant link in relation to the current study, then, is this apparent delay and omission of the '-s' morpheme when it marks third person singular agreement versus plural number on nouns, which is seemingly common to both English-acquiring children and L2 English child and adult learners. As discussed in Section 3, the current study is set within the context of L1 transfer of prosodic representation in line with the PTH, which, it is argued, can, at least to some extent, explain the suppliance and omission rates of L2 inflectional morphology across L1s. However, a challenge to the theory is the disparity in production of third person singular agreement compared to plural marking on nouns, particularly when the inflectional morpheme and prosodic representation are the same.

In considering the role of different predictors in explaining the developmental order of L2 functional morphology, Goldschneider and DeKeyser (2005, p. 63) note that alongside the five determinants (noted in the previous paragraph), more research needs to be conducted to investigate the role of other predictors, such as L1 transfer. Although the authors include the examination of perceptual salience as a determinant in the meta-analysis, there is no reference to the role of the *listener* in relation to the acquisition and suppliance of functional morphology. That is, for example, the *apparent* omission of L2 inflectional morphology as a consequence of the perceptual limitations of the (native speaker) listener, rather than a deficit in acquisition of a specific inflectional morpheme by the L2 speaker. The phenomenon of covert contrasts considered in this paper is set in the context of the variability of suppliance and non-suppliance of '-s' in third person singular agreement compared to the more regular suppliance of '-s' marking plural nouns. This is especially so considering covert contrasts have been attested in L1 acquisition for the last 50 years or so (e.g., Gibbon and Lee 2017b), but that current research suggests that they are potentially more prevalent and widespread in child productions than previously thought (see, for example, Gibbon and Lee 2017a). The attestation of covert contrasts in relation to the literature in both the L1 and L2 is briefly considered in the following section.

4.2. Covert Contrasts in L1 Acquisition and Adult L2 Acquisition

Covert contrasts are statistically significant phonetic differences between two sounds, which may be acoustic or articulatory (Gibbon and Lee 2017a), and which, whilst potentially visible on a spectrogram, are not perceivable by the adult native speaker listener or in transcriptions carried out by native speakers (see, for example, Macken and Barton 1980). Child L1 studies on covert contrasts include, for example, the substitution or neutralisation of contrasting sounds, such as sibilant fricatives [s] versus [ʃ] in English or [s] versus [ɕ] in Japanese (Li et al. 2008). In this study, Li et al. (2008) demonstrate that statistically reliable phonetic differences in the production of two contrasting sounds are evident in acoustical analysis, which is otherwise not audible to native adult listeners. These findings provide insight into how child phonological errors or substitutions are classified, suggesting that some such errors may actually be rather more adult-like and systematic productions than they appear to the native speaker ear. Not all covert contrasts are exemplified in minimal pairs; covert contrasts may also be attested in the reduction of consonant clusters when a complex onset or coda is reduced to a singleton consonant. An anecdotal example illustrating how acoustic analysis can help to identify child development of language-specific phonotactics is the production of word-initial 's- + stop' type consonant clusters (e.g., 'stick'). A covert contrast might be identified in the absence of aspiration in the word-initial phoneme /t/ in '(s)tick' [tɪk] versus aspiration in word-initial stop in the production of 'tick' [tʰɪk][10]. Similar to the study by Li et al. (2008), the distinction between the production of /t/ may not audible to the native speaker listener, but in this instance may be identifiable on a spectrogram. At the same time, Gibbon and Lee (2017a) note that there is a relative scarcity of research studies and subsequent data to illustrate such contrasts. Gibbon and Lee (2017a) propose that acoustic analysis and other instrumental techniques, such as ultrasound (e.g., Zharkova et al. 2017) and electropalatography (e.g., Gibbon and Lee 2017a), may not always capture the existence of a covert contrast due to the complexity (and sheer number) of phonetic cues on which to potentially hone (e.g., Harel et al. 2017). It is suggested that incorporating perceptual judgements, whereby listeners judge along a continuous (rather than categorical) scale according to 'target-likeness' or 'prototypicality', may also help to provide evidence of covert contrasts where a measure of acoustic parameters may not (Gibbon and Lee 2017b, p. 2)[11].

Methodological issues aside, evidence of covert contrasts has also been attested in L2 acquisition. Adult L2 studies also focus on the incidence of covert contrasts in the neutralisation of minimal pairs, including those on vowels, such as high front vowels [i] and [ɪ] (e.g., Song and Eckman, 2019), finding that some adult speakers produce the two vowels with phonetic distinction (with statistical reliability), and in the voicing contrast between [p] and [b] (e.g., Eckman et al., 2015), reporting that some adult L1 Arabic speakers produce a statistically reliable contrast in voice onset time lags in L2 English. Similarly, Aljutaily and Alqweefl (2023) investigate the production of the Arabic /u/-/uː/ contrast by speakers of L2 Arabic from Indonesia and the Philippines, suggesting that the incidence of covert contrast decreases with increased proficiency and the suppliance of overt contrasts. Returning to the conundrum regarding the apparent delay between the acquisition and suppliance of L2 English third person singular agreement versus that on plural number on nouns by L1 Bengali speakers (e.g., Ingham 2019), it is feasible to suppose that the suppliance/omission of the inflectional morpheme '-s' could be an example of a covert contrast in the context of third person singular agreement. That is, a possible explanation for what appears to be the omission of the inflectional morpheme '-s' in one context (third person singular agreement) and not another (plural marking on nouns) is perhaps an outcome of listener judgement (i.e., the inflectional morpheme is phonetically present but inaudible to the native speaker listener for third person agreement in contrast to a 'bare' verb). In order to further consider why this line of argument is proposed to be a feasible explanation for the lower suppliance rates of third person singular agreement versus plural marking on nouns, we return once more to evidence from L1 acquisition, in particular the position of the root to which the inflectional morpheme '-s' is attached within the utterance.

4.3. Child Acquisition of English Third Person Singular Agreement and Plural Number on Nouns

One such account (Song et al. 2009) compares the phonological complexity of the root to which the third person singular '-s' inflectional morpheme is attached (e.g., vowel-final 'sees', versus consonant-final 'needs') as a potential cause of variable production. They conducted an analysis and comparison of longitudinal data (spontaneous speech) from children aged 1;3 to 3;6 (years;months) with a cross-sectional analysis of elicited speech from 23 children with a mean age of 2;2. Amongst other conditions, the authors also compared the sentential position of the target form (utterance-medial versus utterance-final). It was found that inflection was more likely to be produced when the third person singular '-s' morpheme was attached to a simple coda (e.g., vowel-final 'see-s'), avoiding any word-final consonant cluster (Song et al. 2009, p. 637), and this was attributed to the patterns of production initially focusing on unmarked and phonologically simple contexts. The findings also suggested that children produced third person singular inflectional morphology more frequently when it appeared in an utterance-final position, as shorter syllable duration in an utterance-medial position afforded less time for the production of segments (Song et al. 2009, p. 637). This seems to concur with findings from the longitudinal branch of their experiment, indicating that the shorter the mean length of utterance, the greater the likelihood of suppliance of inflectional '-s' on the third person singular form (Song et al. 2009, p. 637).

These findings were contrasted with the suppliance of plural number on nouns, identifying, amongst other differences, the production of consonant clusters in consonant-final stems such as 'cat-s' versus 'work-s' (Song et al. 2009). The authors noted that the suppliance of plurals with a word-final consonant + inflection configuration did not appear to be problematic, so that the issue seemed to be more apparent with third person singular agreement. It should be observed, however, that if the inflection (either as third person singular agreement or plural number on nouns) is in the prosodic representation, so that it is *adjoined* to the PWd, a consonant cluster should not be an issue, as the '-s' morpheme is not incorporated into the PWd. However, Song et al. (2009) also referenced the frequency of inflected plurals in the input versus third person singular morphology, with nouns more likely to be in sentence-final position versus verbs in sentence-medial position, particularly in relation to perceptual salience of the morphology in the input. Related to this, Song et al. (2009) suggest that, in production, third person singular morphology is shorter in duration than that on plural nouns, again reducing the salience of third person singular morphology compared to plural number on nouns.

4.4. Interim Summary

To summarise, the suppliance of third person singular agreement appears to be delayed in both English-acquiring children (e.g., Brown 1973; Song et al. 2009) and adult L2 English learners (e.g., White 2008; Ingham 2019). For both L1 child acquisition and adult L2 English learners, this can be seen in relation to the suppliance of plural noun marker '-s'. The PTH can help to explain why L2 learners with different L1s may find spoken production of L2 inflectional morphology more or less difficult according to the transfer and availability of L1 prosodic representation in relation to that required in the L2. However, the asymmetric production of plural number on nouns versus third person singular agreement cannot be explained by the availability of the required prosodic representation alone. In itself, this is not problematic in terms of the validity of the PTH, as a prosodic account does not preclude the role of other non-prosodic factors in the L2 acquisition process (e.g., Goad and White 2019). Indeed, it would seem logical to assume that other factors alongside L1 transfer of prosodic representation are at work in the L2 acquisition process. Similarly, it seems reasonable to suppose that not all utterances of inflectional morphology and function words are necessarily perceivable to the native speaker listener or transcriber in aural analysis. It is with this in mind that attention now turns to the emergent suppliance of third person agreement morphology versus the more readily available suppliance of plural number on nouns by adult L1 Bengali speakers of L2 English.

5. An Analysis of L1 Bengali Production of L2 English Third Person Singular Agreement and Plural Number on Nouns

In attempting to test whether L1 Bengali speakers of L2 English produce covert contrasts in the development of the suppliance of overt third person singular agreement, the research question for the current study, as set out in (2), is, for ease, reproduced in (16).

(16) Do L1 Bengali speakers of L2 English show evidence of covert contrasts in cases where obligatory third person agreement appears to be omitted?

5.1. Method

5.1.1. Participants

As stated previously, the current study is an exploratory extension from Ingham (2019), during which 28 L1 Bengali participants were recruited from Beginner to Advanced proficiency levels. One of the aims of the original study was to test the predictions of the PTH during developmental proficiency stages from Beginner to Advanced, and participants were recruited in the United Kingdom (UK) and Bangladesh (aged between 18 and 48 years old). A number of participants who resided in the UK were also speakers of Sylheti, and a few participants (*n* = 4) had also previously resided elsewhere in Europe (Spain or Italy).[12] As a relatively difficult to access language group, there are a number of factors which affect the recruitment process. One is that some participants had resided in the UK for a number of years but had had little interaction in the dominant language, with family members perhaps facilitating interaction as necessary. These participants generally scored between Beginner and Elementary on the placement test (see Section 5.1.2). Proficiency, as a limiting factor, also meant that some participants at Intermediate and Advanced levels were recruited in Bangladesh. This also introduced more variables, as participants in Bangladesh were recruited from universities. There were also university-educated participants recruited in the UK, and college education was therefore factored into the main analysis (Ingham 2019).[13] The spectrograms reported in the current study are from participants recruited in the UK, but the collective data include those recruited in the UK and Bangladesh.

5.1.2. Proficiency Levels

The proficiency levels (measured according to the Oxford Quick Placement Test (OQPT) paper and pen test) are reported in Table 1.

Table 1. Proficiency levels.

Proficiency Level	Number of Participants
Beginner	7
Elementary	8
Intermediate	8
Advanced	5

5.1.3. Experiment Design

Designed as a semi-spontaneous elicited production test, participants were invited to a one-on-one session, during which the interlocutor asked questions to elicit the target structure via a set of picture cards presented in random order. The procedure was carried out in three stages: (a) participants were asked to identify general vocabulary related to the picture, (b) participants were presented with the test question(s) to elicit the target structure, and (c) participants were asked general questions related to the response or picture. This format was repeated for each test token (see Appendix A for example picture cards). Sessions were recorded on an Edirol R-09 device. The test tokens were all of the following type: stem-final vowel + inflectional morpheme (e.g., 'boy-s', 'buy-s'), consonant + inflectional morpheme (e.g., 'cat-s', 'sit-s'), or sibilant-final stems (e.g., 'box-es', 'watch-es'). All third person singular agreement structures were sentence-medial ('She (always) drive-s to work'), whilst plural number on nouns were placed in sentence-final position in both

short or longer constructions (e.g., '(There are) three boy-s' or 'There is a cat and three dog-s'). In a few cases, a singular or plural noun appeared in the word-medial position following the verb or determiner (e.g., 'She crack-s (three) egg-s in the bowl'). This was incidental, and the suppliance rates presented here include only utterance-final plural marking on target nouns. All target forms were followed with vowel-initial words or the unstressed indefinite article 'a'. There were a total of 34 test tokens for third person singular agreement and 16 for plural number on nouns, and these are listed in Appendix B[14]. As the focus of the original study (Ingham 2019) was essentially on the suppliance of simple past tense, the tokens for plural number on nouns and third person singular agreement were limited in both number and sentential position of the target form.[15] However, for all plural forms, a singular form was also included within the set (although not consecutively, as tokens were randomised), and in order for the plural form to be analysed, the matching singular form had also to be produced.

5.1.4. Data Analysis

In the first instance, the data were coded regarding suppliance or omission of inflectional morphology. This was conducted via audio and spectrogram analysis, and the sound files were analysed using version 6.3.09 of Praat (Boersma and Weenink 2023). If a participant supplied the appropriate inflectional morpheme on the target or other appropriate base (e.g., target form 'chop-s' produced form 'cut-s'), then inflection was considered 'supplied'. Similarly, absence of the inflectional morpheme was coded as 'not supplied'. All other responses were removed from the analysis. In sum, the analysis of the count of suppliance and omission of obligatory inflectional morphology across Beginner to Intermediate proficiency levels was conducted in two stages: (a) inspection of spectrograms and audio looking for evidence of suppliance of inflection, and (b) inspection of spectrograms and audio to look for evidence of covert contrast in instances of omission of third person singular agreement.

In the original study (Ingham 2019), data were analysed from a total of 28 participants within and across proficiency levels. The generalised estimated equations modelling approach was adopted to estimate the associations between different variables and the suppliance of inflectional morphology, and the base model was run with the predictors of proficiency level and word category type, with a two-way interaction (noted with the asterisk symbol *) between proficiency and word type category (Table 2).

Table 2. Base model: Overview of the suppliance of inflection.

	Predictor	QICC	ΔQICC
Overview	proficiency, word type, proficiency*word type	2120.221	-

This approach allows multiple responses per subject and accommodates missing data. The proficiency levels and suppliance rates of the inflectional morphology under inspection in the current study are illustrated in Table 3; columns (a) and (b) provide the proficiency level and number of participants, respectively, and columns (c) and (d) are the estimated mean score for suppliance of inflectional morphology per word category.

Table 3. Proficiency levels and estimated means in the suppliance of third person singular (3 sg) and plural number on nouns (pl)[16].

(a) Proficiency	(b) Number of Participants	(c) 3 sg	(d) pl
Beginner	7	0.08	0.44
Elementary	8	0.28	0.76
Intermediate	8	0.57	0.95
Advanced	5	0.96	1.0

5.2. Findings

The aim of this study was to look for systematic evidence of covert contrasts in the instances when third person singular agreement was omitted by participants from Beginner to Intermediate proficiency levels.

Evidence of systematic covert contrasts: There was no evidence of covert contrasts in the spectrograms of any learner from Beginner to Intermediate proficiency levels.

This tentative result of no covert contrasts in the analysis of the production of non-suppliance of the '-s' morpheme on third person singular agreement by L1 Bengali speakers of L2 English is illustrated below with samples from two participants, one at Beginner proficiency level and one at Elementary proficiency level. The data presented here are typical of participants within and across the proficiency levels. Participant BEA1 was selected to illustrate the potentiality for suspected covert contrasts, here, interestingly, in the suppliance of '-s' on the noun 'egg' in the medial rather than end position (in the production of 'egg-s' as seen in Section 5.2.1, e.g., Figure 2)[17], and Participant BEB1 was selected to illustrate the clear contrast between suppliance and omission of inflectional morpheme '-s' without any evidence of covert contrast (in the suppliance of 'sit' illustrated in Section 5.2.2, e.g., Figure 6).

5.2.1. Sample 1: L1 Bengali Speaker of L2 English at Beginner Proficiency Level

Participant BEA1 scored 12 on the OQPT, placing them at Beginner A1 (Common European Framework of Reference) or Entry Level 1 (according to the UK national standards of English for Speakers of Other Languages). This female participant was age 37 at the time of testing and had resided in the UK for a total of 14 years. Participant BEA1 had completed tertiary education and was a speaker of Dhaka Bengali. Of the obligatory instances of third person singular agreement and plural number on nouns, Participant BEA1 rarely supplied inflection, as shown in Table 4.

Table 4. Suppliance and omission of third person singular agreement and plural number on nouns by L1 Bengali speaker of L2 English at Beginner proficiency level (BEA1).[18]

BEA1	Number of Elicited Tokens	Supplied	Omitted	Other[19]
Third person singular	34	1	29	4
Plural noun	16	5	9	2

When inflection was omitted, however, there was no systematic evidence in the spectrogram of the production of covert contrasts to indicate that the learner was attempting to mark inflection or to acknowledge that the verb in the third person singular required some form of agreement. However, in the production of the plural noun marker on the sentence-final utterance 'There are three boy-s' shown in the spectrogram (Figure 1), there was a significant delay before the plural '-s' morpheme was supplied. This could suggest that in an utterance-final position, the participant had both the time and opportunity to include the plural marker after production of the stem 'boy'. It could also indicate that the inflection is attached to the prosodic word (there was clear production of the stem before inflection was supplied), perhaps illustrating the interaction between utterance position and prosodic structure in the development of the acquisition of inflectional morphology. This is, of course, speculation based on little evidence, but it is a possible avenue for further enquiry to identify which factors might work together to aid or delay suppliance of L2 inflectional morphology.
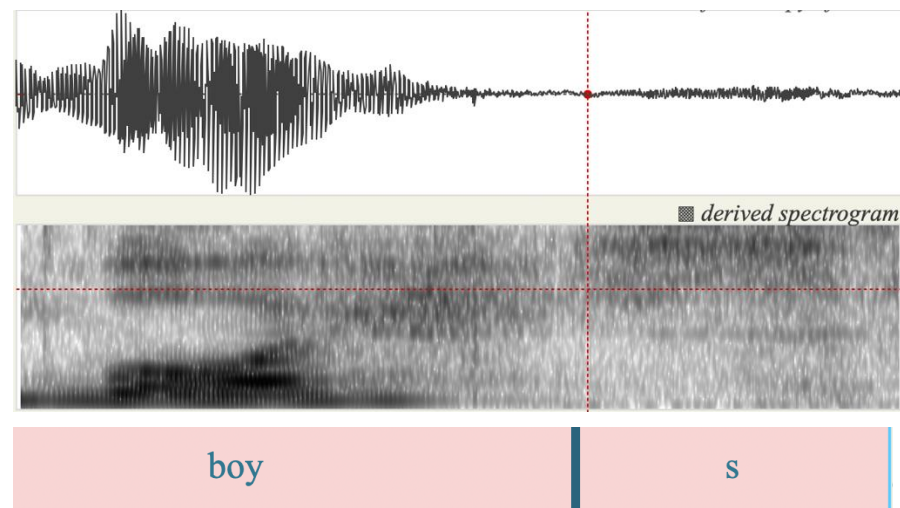
Figure 1. Spectrogram of 'boy-s' by Participant BEA1.

Although not included in the overall plural noun count (see Section 5.2) when in sentence-medial position, Participant BEA1 omits inflection on both the verb ('crack' for elicited form crack-s) and the 'incidental' noun ('egg' for plural form egg-s), as shown in Figure 2.
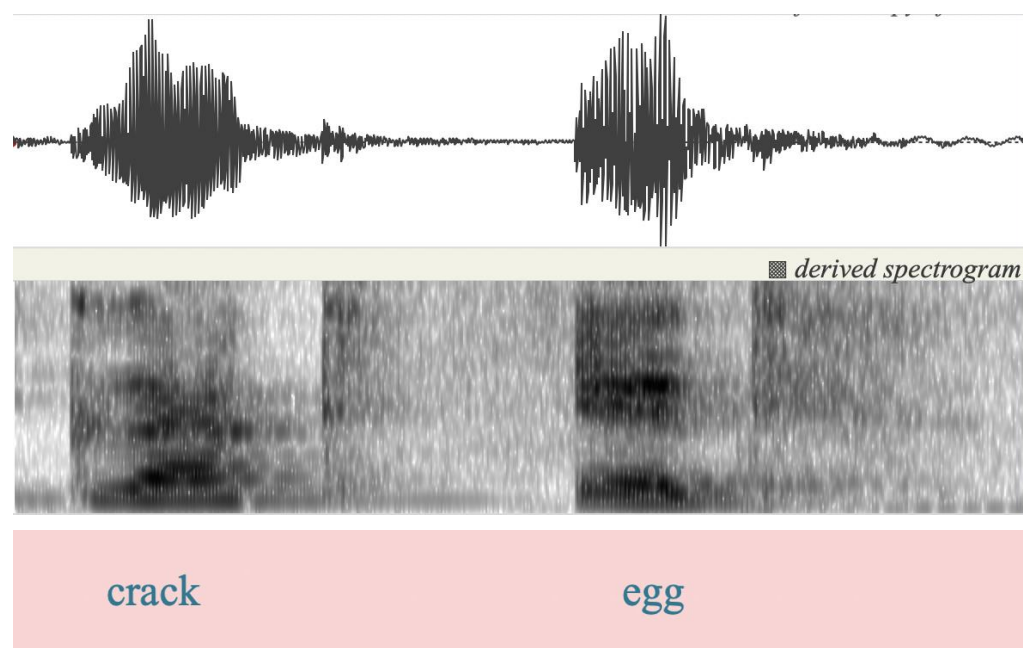

Figure 2. Spectrogram of 'crack egg' by Participant BEA1.

However, the spectrogram arguably shows some sign of possible articulatory action following the production of 'egg', which is not visible following production of the verb 'crack' or following the verb 'ask' (target 'ask-'s, produced without the inflection), as shown in Figure 3. This pattern of no systematic articulatory activity following the omission of agreement on third person singular forms is indicative of the remaining examples of omission of third person singular agreement marking for Participant BEA1, as well as the other Beginner participants in this study.

Figure 3. Spectrogram of 'ask everybody' by Participant BEA1.

When the elicited form was the irregular past form 'gave', Participant BEA1 produced 'give-s' in medial position (Figure 4). Whilst errors of commission are relatively rare in L1 acquisition compared to errors of omission, errors of commission are attested in the earlier stages of L2 acquisition, declining with increased competency. However, the ability to produce 'give-s' in an unsolicited or unelicited context could simply be indicative of a memorised chunk and not an example of an analysed form. However, this is beyond the scope of the current paper.

Figure 4. Spectrogram of 'gives' (for 'gave') by Participant BEA1.

In sum, it seems that, as a Beginner, Participant BEA1 is aware of including plural number on nouns and is able to produce this on some occasions, such as when the noun is in utterance-final position. When the plural noun is in utterance-medial position, as in 'egg-s' in Figure 2, there is some suggestion of articulatory activity that *potentially* could constitute a covert contrast (otherwise inaudible), but there were insufficient examples of this token type to extract a pattern. If so, this suggests that covert contrasts between 'bare' and inflected nouns could also be a source of investigation. There was no evidence of covert contrast in the cases where third person singular agreement was not supplied.

5.2.2. Sample 2: L1 Bengali Speaker of L2 English at Elementary Proficiency Level

Participant BEB1 scored 16 on the OQPT, placing them at Elementary A2 (Common European Framework of Reference) or Entry Level 2 (according to the UK national standards of English for Speakers of Other Languages). This female participant was 48 years of age at the time of testing and had resided in the UK for a total of three years, and in Spain for a total of 12 years, prior to moving to the UK. It was reported that although they had not taken formal lessons in Spanish, they had learned some Spanish whilst carrying out daily tasks, such as shopping for food. The participant did not claim to speak Spanish as an L2 and stated that the family spoke only Bengali at home and in the immediate community, as they resided alongside other Bengali families, including relatives. Participant BEB1 was a native speaker of Dhaka Bengali, had completed tertiary education, and had taken English language lessons during their education. Of the obligatory instances of third person singular agreement and plural number on nouns, Participant BEB1 showed some greater instances of suppliance of inflection compared to participant BEA1 (See Tables 4 and 5 for comparison). When third person singular agreement was not supplied, there was an increased number of 'other' responses compared to Participant BEA1.

Table 5. Suppliance and omission of third person singular agreement and plural number on nouns by participant BEB1.

BEB1	Number of Elicited Tokens	Supplied	Omitted	Other
Third person singular	34	9	15	10
Plural noun	16	13	2	1

An example of the suppliance of third person singular agreement by participant BEB1 is given in Figure 5 'she need-s', and a typical example of the omission of agreement on 'sit' is given in Figure 6, where there is no indication of articulatory activity or potential covert contrast in the spectrogram.
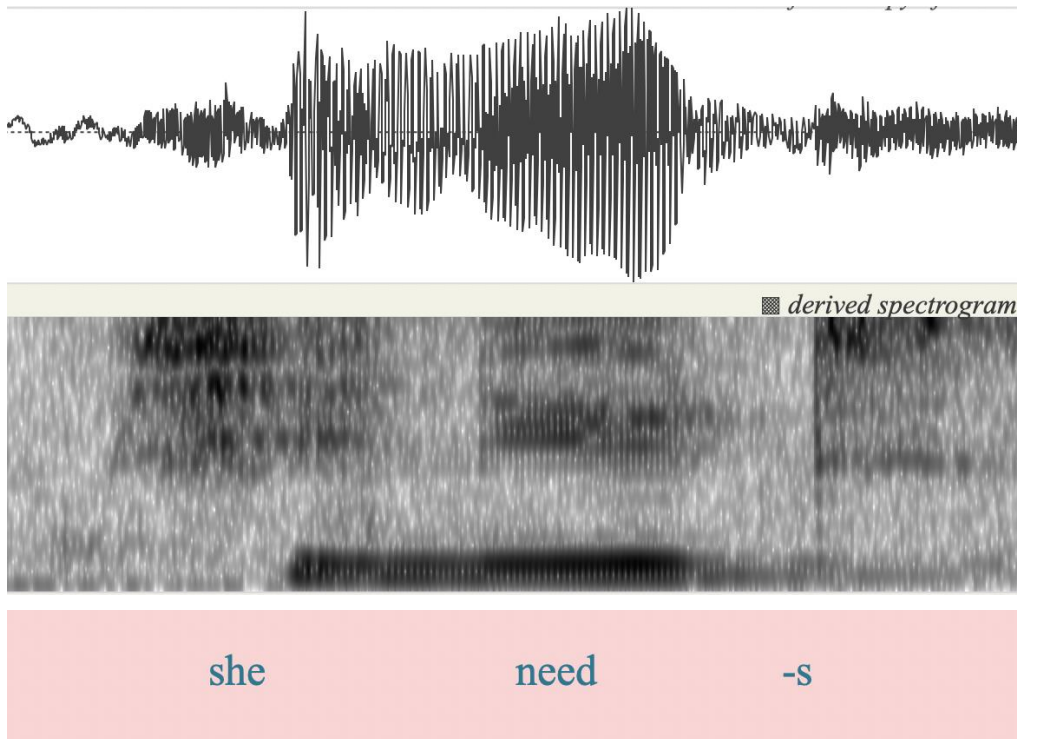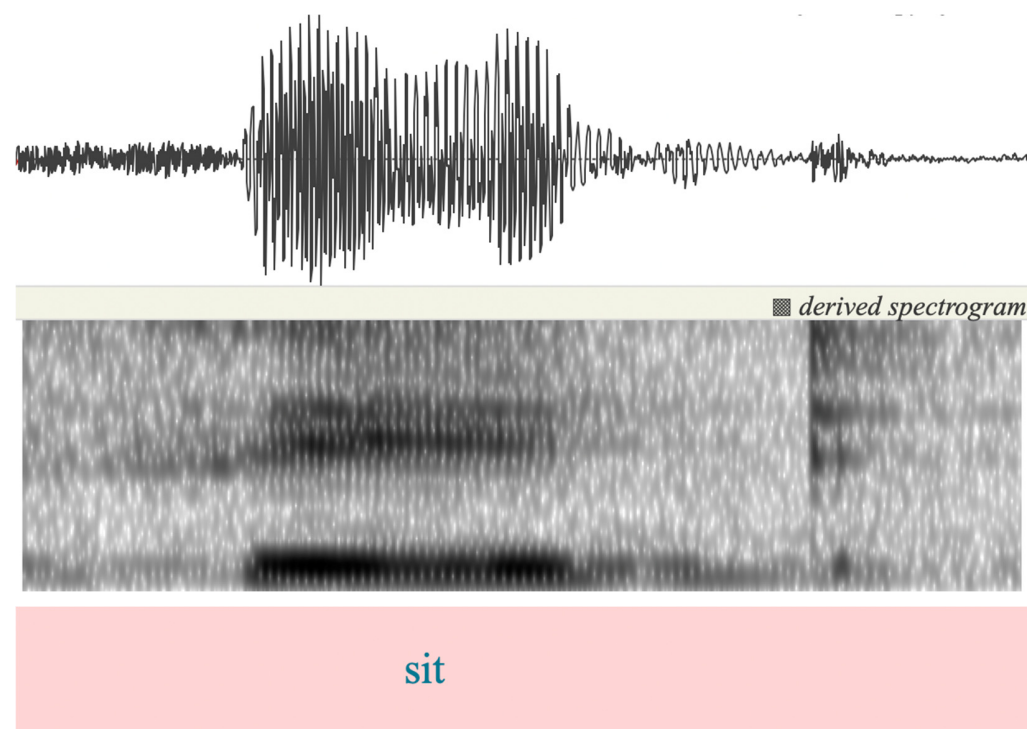

Figure 5. Spectrogram of 'she need-s' by BEB1.

Figure 6. Spectrogram of 'sit' by BEB1.

6. Discussion

The suppliance of L2 English third person singular agreement and plural marker inflectional morphology requires the ability of the L2 speaker to (a) attach affixation in the required L2 prosodic representation and (b) produce the plural marker and its allomorphs[20]. As has been discussed, L1 Bengali speakers arguably have little restriction to accessing the required L2 prosodic representations in accordance with the PTH, and it appears that, as would be predicted by the PTH, learners rarely omit inflectional morphology in either context by more advanced proficiency levels. It is the comparative availability of the L2 required PWd adjoined prosodic representation for L1 Bengali speakers in contrast to, say, the availability and complexities of creating the required PWd adjoined representation for L1 Mandarin speakers of L2 English that provides further support for the role played by prosodic representation in accordance with the PTH. In terms of individual sounds required for the suppliance of the inflectional morpheme '-s', the Bengali fricative inventory includes both /s/ and /z/ (via English loanwords, and possibly even as assimilated sounds, particularly in some dialects, see, for example, Boyle David 2015). If the required sounds and prosodic representation are available to mark the L2 English inflectional morphology under question by L1 Bengali speakers, what, then, can account for the higher suppliance of plural number on nouns compared to third person singular inflection at Beginner to Intermediate proficiency levels?

The overall suppliance results indicate that there is a steady increase in the suppliance of third person singular agreement inflection across proficiency levels by L1 Bengali speakers of L2 English, and by Intermediate level, the suppliance of third person agreement is above chance at 57% (e.g., Ingham 2019). The inspection of spectrograms did not provide any systematic pattern of covert contrasts in the instances of omission of third person singular agreement by individuals at Beginner, Elementary, or Intermediate proficiency levels. Although there is evidence of some isolated instances, which potentially seem to suggest articulatory activity which is otherwise inaudible (such as the example given in Figure 2 with target form 'egg-s'), this is (a) relating to plural marking on nouns not third person agreement, and (b) not recurring or systematic within (or across) subjects. It seems, then, that the asymmetry in the production of plural number on nouns over that of third

person singular agreement by L1 Bengali speakers of L2 English, as examined in the sample in this study, cannot be explained by covert contrasts. At the same time, the absence of evidence in this small dataset does not preclude the possibility of covert contrasts in the development of acquiring inflectional morphology.

One possible explanation is position in the utterance and potentially frequency effects, i.e., the utterance-medial positioning of verbs requiring third person agreement versus the utterance-final position of plural nouns in simple declaratives. This could be related to factors such as saliency in perception of the inflectional morphemes from the learners' perspective as well as the durational opportunity for articulation of the inflectional morpheme when the target form is in utterance-medial position (i.e., the verb requiring third person singular agreement). This is addressed in L1 acquisition by (e.g., Song et al. 2009) and is perhaps supported in the example presented here in Figure 1, whereby the inflectional morpheme is applied after a delay in the production of the stem in 'boy-s'. Possibly, durational issues alone may have resulted in lack of inflection had this token been set in an utterance-medial position. As such, a measure of the suppliance of inflectional morphology for third person singular agreement and plural marking on nouns in utterance-medial position may well provide a different pattern of suppliance rates to the ones recorded here.

Related to utterance position, however, is the suppliance of non-target inflection. In the current study, the category of 'other' responses was included in the sample cases set out in Tables 4 and 5, indicating the number of instances where the target inflection was neither supplied nor omitted but possibly circumvented or incorrectly supplied. If the suppression of the suppliance of inflectional morphology can be related to utterance-medial position of target forms, then the suppliance of, for example, unsolicited regular simple past inflection '-ed' or present participle '-ing' in third person agreement utterance-medial contexts must also be explained. Although analysis of 'other' responses is beyond the scope of the current study, it should be noted that such substitutions are PWd adjoined, in line with the target inflection forms. In the case of the L1 Bengali participants in the current study, the suppliance of 'other' responses seemingly increased with a developing level of proficiency in the L2 and then decreased, even abruptly ceasing in some cases, as higher levels of proficiency were reached. For example, Participant BEA1 (Beginner) produced only four 'other' responses in the elicitation of third person singular agreement. Three of these were non-target inflection on more frequently occurring verbs, according to the frequency tables compiled by Leech et al. (2001). Producing more 'other' responses, Participant BEB1 (Elementary) produced seven instances of regular simple past tense inflection out of a total of ten 'other' responses in medial-utterance position. This is not to say that utterance position is not relevant in the analysis of suppliance of inflectional morphology on third person singular agreement in utterance-medial position, but that it appears to be only one potential strand of a seemingly interconnected, multi-faceted explanation. This could well include, for example, frequency of the token in the input, and other possible explanations (consistent with L1 acquisition studies) regarding the effect of the stem-final vowel or consonant on suppliance of inflectional morphology (e.g., Song et al. 2009). Again, a detailed investigation of stem types may indicate whether some verbs are inflected for person agreement before others.

Returning to the current study, the question remains unanswered as to why L1 Bengali speakers of L2 English can produce such relatively high rates of plural number on nouns from early (Beginner) proficiency levels but not on third person singular agreement, given their shared prosodic representation available in the L1 and the same phonological form '-s'. The ease of availability of the required prosodic representation is part of the task for learners in producing L2 inflectional morphology, and whilst L1 Bengali speakers seem to benefit from the transfer of L1 prosodic representation, this is clearly insufficient alone to explain the asymmetry. Although no evidence for covert suppliance of non-suppliance of third person singular inflectional morphology was found in this limited dataset, there arguably remains potential for development of this line of investigation. For one thing, covert contrasts appear to be fairly difficult to 'catch' (two out of five participants showed

evidence of covert contrasts in Eckman et al. (2015), but this could easily have been a potentially very different picture at an earlier or later data point). In sum, the lack of evidence of covert contrasts in the non-suppliance of third person singular agreement in this study does not necesssarily equate with the absence of this phonological phenomenon in L2 acquisition of inflectional morphology. Looking ahead, a number of adjustments could be made in order to facilitate a more rigorous and logical investigation, including, for example, testing for covert contrasts between non-suppliance of inflection (on both verbs and nouns) against true infinitive forms (versus 'bare' verbs), as well as manipulating target forms in relation to utterance position and stem type. Finally, just as Gibbon and Lee (2017a, 2017b) consider the effectiveness of various methods in testing for covert contrasts, it might be that, in L2 acquisition studies, other methods, such as ultrasound tongue imaging (e.g., Song and Eckman 2021), alongside aural and spectrogram analysis, are more effective in determining whether covert contrasts are attested or not.

Appendix A

Sample semi-spontaneous elicitation test tokens (interlocutor-participant question and answer format) for third person singular agreement and plural number marking on nouns.

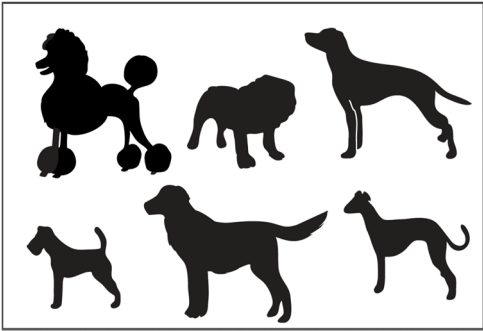(a)   Third person singular agreement

Token cards for third person singular agreement consisted of a subset also used to elicit simple past tense (reproduced from Ingham 2019).
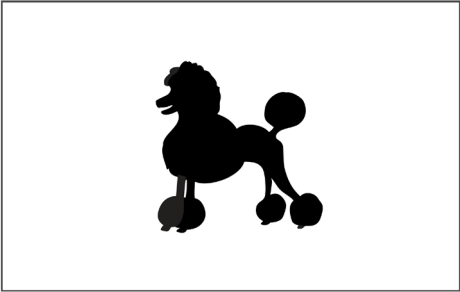

(b)   Plural number marking on nouns

All plural tokens (i) were set against a singular token (ii) to ensure plurality was being marked with the morpheme '-s' (reproduced from Ingham 2019).

(i)   dog-*s*

(ii)   dog

Appendix B

Semi-spontaneous elicitation task stimuli for third person singular agreement and plural number marking on nouns.

Table A1. Third person singular agreement (*n* = 34).

Token	Stem Sub-Category
drives	voiced (V)
feels	V
finds	V
keeps	unvoiced (U)
leaves	V
needs	V
shows	V
types	U
works	U
writes	U
asks	U
chops	U
cracks	U
drills	V
drops	U
gives	V

Table A1. *Cont.*

Token	Stem Sub-Category
lives	V
looks	U
picks	U
pins	V
plans	V
pulls	V
sits	U
tells	V
wants	U
yells	V
crosses	U
faces	U
kisses	U
misses	U
presses	U
races	U
washes	U
watches	U

Table A2. Number agreement on nouns (*n* = 16).

Token	Stem Sub-Category
apples	voiced (V)
bins	V
books	unvoiced (U)
boxes	U
boys	V
cats	U
clocks	U
days	V
dogs	V
flies	V
foxes	U
glasses	U
grapes	U
pills	V
toys	V
watches	U

Notes

[1] Some participants were also speakers of Sylheti. Sylheti is a dialect which is widely spoken by Bengali speakers across Bangladesh and India (see, for example, Chalmers 1996 for an alternative account regarding whether it should be considered a language rather than dialect). For the purposes of the current study, whether participants were speakers of both the Sylheti dialect and Bengali is taken into account as a variable in the statistical analysis. See Ingham (2019) for a brief discussion of aspects of phonology, prosodic representation, and transfer of Sylheti prosodic representation in relation to Bengali.

[2] The cause of this apparent asymmetry is subject to debate beyond the scope of the current study. Kahoul (2014), for example, proposes that the difference observed between the suppliance of plural and grammatical markings could potentially be attributable to the fact that AgrP is yet to emerge or is unstable.

3   See, for example, Goad et al. (2003); Goad and White (2004, 2006, 2019) for a full discussion of the theoretical background of the PTH.

4   Examples (8a) and (8b) reproduced from Ingham (2019); reproduced and adapted from Goad et al. (2003, p. 248).

5   Examples (8c) and (8d) reproduced from Ingham (2019); reproduced and adapted from Goad et al. (2003, p. 252) and Li and Thompson (1981, p. 49).

6   See also Li and Yang (2022) for an alternative interpretation of the availability of comparative inflectional morphology in Mandarin, compatible with the Representational Deficit Hypothesis (Hawkins and Liszka 2003).

7   Each finite tense (present, future, and past) has a dedicated person marker (e.g., first person in the present *-i*, in the future *-o*, and in the past *-am*). Furthermore, second and third person markers are also subject to formality.

8   Examples in (13) adapted from Ingham (2019, 2022).

9   It should be noted that the three children under observation (spontaneous speech production) were not interconnected, and different researchers were responsible for each child (Brown 1973).

10   This does not have to be contrasted in terms of 'stick' versus 'tick'; the key point is that there should be a lack of aspiration in the context where 'stick' would be the appropriate lexeme, then a contrast is identified between a stop as the initial or following sound in the onset of a syllable.

11   See also Conover and Huntley Bahr (2023) and Munson et al. (2017) for discussion on the effect of methodology and rating scales on the analysis of perceptual ability.

12   The participants were recruited both in the UK and Bangladesh to ensure a range of proficiency levels. As reported in the original study (Ingham 2019), the generalised estimating equations modelling approach was used to estimate associations between variables (e.g., Sylheti speaker, college education, verb type, log frequency, proficiency, etc.) and the suppliance of inflectional morphology in spoken data.

13   It was established that there was interaction between college education and the suppliance of inflectional morphology, and this was factored into the model build.

14   Fewer tokens for third person singular agreement and plural number on nouns were included in the original study compared to regular simple past tense due to the focus on the suppliance of inflection on regular simple past; the elicitation of non-past inflectional morphology was conducted primarily in relation to analysis of prosodic representation and comparison data.

15   As pointed out by an anonymous reviewer, the comparison of inflection on verbs in utterance-medial position and nouns in utterance-final position introduces a potential source of asymmetry. Song et al. (2009, p. 626) consider the effect of utterance position in L1 acquisition, and note that as a SVO language, English-acquiring children will be more likely to hear third person singular verbs in utterance-medial position compared to plurals in utterance-final position in parental speech (and this corresponded to the majority of third person singular agreement in the subjects' production). It follows that adult L2 learners may also be exposed to third person singular verbs and plural nouns in medial and final position, respectively, and that, subsequently, elicited spontaneous production in the current study mirrors this. Manipulation of utterance position would be of value in future studies.

16   Adapted from Ingham (2019).

17   As stated in Section 5.1.3, only number on nouns in utterance-final position were included in the data analysis.

18   Presented here as raw scores (Tables 4 and 5).

19   The category 'other' was sub-analysed in instances where an unsolicited inflectional ending was supplied. These data were not analysed for the current paper, but it remains an area to be investigated, particularly in relation to the utterance-medial versus utterance-end position of target forms.

20   An anonymous reviewer pointed out a third option, which is to use existing L1 representations. This is investigated in depth by Goad and White (2006) in relation to the suppliance of past and perfective forms of both regular and irregular verbs, such as 'wrapped' and 'kept', by L1 Mandarin speakers. The authors argue that phonetic evidence (primarily the presence or absence of fortis release in VCC combinations in relation to syllabification and domain boundary) provides clues as to when a regular form is inflected in a target-like PWd adjoined representation versus a non-target-like (but more readily available) L1 PWd internal representation. In contrast to Mandarin, Bengali requires inflectional material to be prosodified both internally and adjoined to the PWd. The potential task for the L1 Bengali speaker is arguably to allow minimal adaptations in the relicensing of prosidc structure to L2 forms.

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