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Silence is difficult: On missing elements in bilingual grammars

Abstract: Near-native speakers (heritage speakers and adult second language learners alike) experience difficulty in interpreting and producing linguistic constructions that contain morphologically null elements. We dub this phenomenon the *Silent Problem*. The bulk of literature on the Silent Problem in near-native speakers has concentrated on the identification and interpretation of null pronominals. In this paper we expand our understanding of the Silent Problem in three ways. First, we show that the range of the problem extends well beyond the grammar of null pronominals. Second, we argue that the various manifestations of the Silent Problem all follow from a typical aspect of near-native grammars: difficulty in recovering missing elements that have discourse antecedents. Third, although heritage and second language speakers show similar difficulties in the recovery of discourse-licensed silent elements, the two speaker populations differ in their evaluation of zero-marked forms in contrastive contexts. We account for this difference by the fact that heritage speakers differ from second language speakers in the comprehension of contrastive material. This comprehension requires good control of the interface between syntax and information structure (including prosodic knowledge), and heritage speakers have an advantage over second language learners in that area.

Keywords: null pronouns, topic marking, referential dependencies, contrast

1 Introduction: The Silent Problem

Near-native heritage language (HL) and L2 speakers differ from native speakers in their ability to establish and maintain long-distance dependencies (Benma-

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moun et al. 2013; Scontras et al. 2015). Researchers have linked difficulties with long-distance dependencies to a number of factors, including processing problems in establishing non-local coreference (O'Grady 2011, 2015), difficulty in linking material from different domains (Sorace 2011; Sorace and Serratrice 2009; Reuland 2011), and delay in the development of mapping principles at the syntax-discourse interface (Grinstead 2004; Platzack 2001).

Since different explanations may be appropriate for different long-distance dependency problems, it is important to examine the factors involved in the construction of particular long-distance dependencies. In this paper, we concentrate on anaphoric dependencies associated with silent elements, i.e., elements lacking overt morphological realization. Non-target-like distribution of null and overt forms is reported in a number of HL and L2 studies (Ivanova-Sullivan 2014; Montrul 2004; Pérez-Leroux and Glass 1999; Rothman 2009; Serratrice et al. 2004; Quesada 2015; White 1985). However, previous research on overt and silent categories in HLs has largely been confined to the phenomenon of null pronominalization in pro-drop languages. In this paper, we show that the range of difficult silent elements also extends outside of the pro-drop context to freestanding null pronominals and null morphemes, and argue that basic design principles present in both HL and L2 grammars determine this set of difficulties. We show that, in general, near-native speakers differ from their monolingual counterparts in their ability to identify and evaluate missing elements with discourse antecedents. We will refer to this difficulty broadly as the *Silent Problem*.

While the Silent Problem in anaphoric dependencies is pervasive, not all types of silent elements are *equally difficult* for all types of bilingual speakers. Anaphoric referential dependencies constructed and evaluated at the level of discourse appear to present comparable challenges to HL and L2 speakers, but HL speakers exhibit a systematic advantage over adult L2 learners (L2ers) in the evaluation of contrastive material. We hypothesize that the prosodic salience of contrastively-marked elements is more perceptible to HL speakers, who acquired their language in a naturalistic setting, than to late L2ers, who acquired the language more formally.

Our data come from two separate studies: one on the distribution of null and overt topic markers in Korean (Section 2), and one on null and overt subjects in Russian subordinate clauses (Section 3). Section 4 unifies the results of the two studies; some concluding remarks are offered in Section 5.

2 The Silent Problem in Korean: Null topic particles

In this section, we examine the phenomenon of particle omission, which occurs under specific discourse-licensed conditions in languages characterized by topic prominence. After presenting descriptive generalizations about the contextual licensing of null particles in Korean, we discuss experimental data from HL speakers and L2ers of Korean that speak to a specific manifestation of the Silent Problem: contexts in which topic particles lack overt phonological realization.

Studies on topic-prominent languages have shown that adult bilinguals often struggle with producing and interpreting null elements in topic positions. These studies have focused primarily on the phenomenon of topic drop (i.e., discourse-licensed omission of the entire topic constituent) in L2. For example, advanced learners of Japanese have been shown to experience more difficulty evaluating antecedents of null topic NPs than overtly expressed topic NPs (Okuma 2011). Similar delays in the acquisition of null anaphora by L2ers have been reported in Korean (Jung 2004).

In what follows, we show that ambiguity resulting from topic *particle* omission (versus omission of the entire topic constituent) provides another window onto the nature of the Silent Problem. While both HL speakers and L2ers generally find topic particle omissions difficult to evaluate, a more detailed analysis reveals an asymmetry in how these two populations rate null topic particles in anaphoric and contrastive contexts. HL speakers demonstrate an advantage over L2ers when evaluating omissions in contrastive contexts, but not discourse-anaphoric contexts. In the following section, we discuss some specific distinctions between contrastive and anaphoric topic particles in Korean and outline general principles governing their distribution in the baseline language.

2.1 Background

2.1.1 Range of topic constituents

As a topic-prominent language, Korean employs two distinct types of particles to mark external arguments. The subject marker -*ka*/-*i*[1] plays a key role in identifying the argument structure of the sentence, whereas the topic marker

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1 The nominative case marker is realized as -*ka* after a vowel and -*i* elsewhere.

-(n)un participates in information structure partitioning (Choi 1999; Kuno 1973). These particles are illustrated in (1b) below.

(1)   a.   'Tell me about this hat.'
       b.   *ku   moca-nun$_i$ John-i   ecey   e$_i$ sasse.*
            DEM hat-TOP   John-NOM yesterday   bought
            'This hat, John bought yesterday.'
            (Vermeulen 2010: exx. [9], [10])

The topic has at least two distinct functions: *thematic* (identifying the theme of the utterance), and *contrastive* (relating the theme to its alternatives in discourse) (Choi 1999; Kuno 1973; Lee 2008). Despite a formal similarity, the two types of topics differ in their interpretation, distribution, and prosody. "Typically, a non-contrastive Topic is given, presupposed, or anchored in the speech situation. It is something that is talked about by the [...] predicate and lacks contrastiveness and is located at the initial, prominent position of a sentence." (Lee 2008: 152) This restriction to sentence-initial position in root clauses indicates that thematic topics are associated with a fairly high structural position, one that is not available in some embedded structures. For instance, the topic reading is impossible in a control complement (note that the literal English translation is also unacceptable):

(2)   *#Mina-ka [ku   moca-nun phal]-leyko noleykhayessta.*
       Mina-NOM DEM hat-TOP   sell-COMP   endeavored
       'Mina tried to sell this hat.' (lit. "Mina endeavored [this hat, to sell]")

Within the category of thematic topics, it is common to differentiate between anaphoric and generic topics based on their referential properties. Anaphoric topics explicitly refer to previously mentioned entities in the discourse, such as *this hat* in (1b), while generic topics do not, as illustrated in (3):

(3)   *Pihanki-nun 747-i   khu-ta.*
       airplane-TOP 747-NOM big-DECL
       'As for airplanes, 747s are big.'
       (Li and Thompson 1976: 468)

Thus, only anaphoric topics can link elements at a distance, in particular across utterances. This in turn makes the retrieval of anaphoric topic referents subject to greater memory constraints, in addition to the grammatical constraints on the occurrence of topic particles; both sets of constraints may cause processing or representational difficulties for bilingual speakers.

Further divisions are available within anaphoric topics based on the type of prior mention in discourse, namely:

(4) Antecedents of anaphoric topic
  a. the referent is introduced as new in discourse, most typically as an internal argument (direct object or subject of an unaccusative), and is then resumed by the anaphoric topic (Birner and Ward 1998; DuBois 1987);
  b. the referent is already in use as topic, and the appearance of the anaphoric topic is yet another link in the topic chain (Ariel 2010).

In this paper, we will only be concerned with the first type, which is illustrated by the following example:

(5) *Nauy chingwu Minswu-ya.*
    my   friend   Minsoo-DECL
    Minswu-nun ilpon-ulo yuhak(-ul)   kal ke(s-i)-ya.
    Minswu-TOP Japan-to studying.abroad-ACC go will-COP-DECL
    'This is my friend Minsoo. Minsoo is going to Japan to study abroad.'

Researchers disagree on the specific prosodic contour associated with thematic topics. Jun (1996: 101) describes it as an H boundary tone (H%), but Lee (2008: 158) comments on its extremely low pitch, stating that "marking H indiscriminately on their S-initial *-nun* in Jun's [...] K-ToBI may have to be reconsidered, despite the tendency of LHLH AP in Korean." Given the subdivisions within thematic topics that we have just outlined, it could well be that different authors interpret the category differently, that is more broadly or in a more constrained manner. At least for thematic topics such as shown in (5), the H boundary tone seems common and uncontroversial. Regardless of their interpretation of the boundary tone, all researchers agree that the duration of the thematic-topic-marking *-nun* is relatively short, as compared to the contrastive-topic-marking *-nun* to which we now turn.

Contrastive topics (CTs) differ from thematic topics in that CTs involve a choice between two or more entities in a presupposed contrast set, often to the exclusion of the other members of the set. "Contrastive Topic [...] is also given, presupposed, or anchored in the speech situation to a certain degree like a non-contrastive Topic. It is controversial whether it is also something that is talked about [...]." (Lee 2008: 153) Unlike thematic topics, CTs do not have to be clause-initial (although such placement is possible); they can appear in root or embedded clauses. Finally, CTs are specifically associated with a LH boundary tone on the marker *-nun* (Lee 2008; Finn 1984; Nakanishi 2001). As indicat-

ed above, the duration of CT-marking -*nun* is significantly longer than that of its thematic-topic-marking counterpart (Lee 2008).

The following example illustrates the use of a CT in a root clause; here the contrast is between two referents in an established contrast set, Inho and Yengswu:

(6) (After hearing that Inho didn't come, regarding the speaker's friend Yengswu)
Yengswu-nun wasse.
Yengswu-CT came
'Yengswu$_{CT}$ came.'
(Lee 2008: 157)

If we now revisit the example in (2) (which was unacceptable under a regular topic reading), we find that the CT reading is available, confirming that these topics are available in different structural positions, including in relatively small syntactic structures:

(7) *Mina-ka [ku moca-nun phal]-leyko noleykhayessta.*
Mina-NOM DEM hat-TOP sell-COMP endeavored
'Mina tried to sell this hat$_{CT}$ (as opposed to another item for sale).'

Let us now consider the behavior of thematic and contrastive topics in the context of particle ellipsis.

2.1.2 Particle omission in Korean

Both subject and topic particles in Korean can be realized overtly or covertly, as illustrated in (8) below. The omission (deletion) of particles has been discussed extensively in the literature on topic-prominent languages (Kuno 1973; Lee 2006; Tsutsui 1984). Most descriptions of particle ellipsis analyze sentences with null particles as optional alternatives to those in which the particles are overtly expressed; however, some recent analyses have proposed to treat the null particle as an independent linguistic unit with its own discourse-pragmatic functions but no phonetic realization (Kwon and Zribi-Hertz 2008; Shimojo 2006):

(8) *Sensayngnim-Ø hay-si-ess-ta.*
teacher-NOM/teacher-TOP come-HONORIFIC-PST-DECL
'The teacher came.'

Data from monolingual production show that zero-marked particles are frequent in colloquial registers (Fry 2003; Tsutsui 1984) and outnumber overt particles in conversation (Shimojo 2006). However, null topic particles are not equally acceptable in all contexts; for example, the null particle is very natural in (9a) below, but considerably less acceptable in (9b), where the topic phrase is not ratified as shared knowledge in the same way and requires an overt topic marker (see Lee 2015):

(9) (Do you remember Minsoo?)
    a. *Ung, ku   salam-Ø   acwu chakhay poi-ess-ci.*
       yes   that person-TOP very be.nice look-PAST-DECL
       'Yes, he looked very nice'

    b. *Ung, pwuin-un/#pwuin-Ø acwu chakhay poi-ess-ci.*
       yes   wife-TOP   very be.nice look-PAST-DECL
       'Yes, his wife looked very nice'
       (adapted from Lee 2015: 761)

In accounting for the distribution of null and overt particles in spoken registers, researchers have identified a number of semantic, syntactic, and discourse-pragmatic factors associated with the use of null particles. These recurring observations are summarized in (10):

(10) Factors correlated with null particles in topic-prominent languages:
    a. *semantics*: animate and definite or specific subjects (Fry 2003; Lee 2006); anchoring to speech time (Kwon and Zribi-Hertz 2008);
    b. *structure*: short (syntactically less complex) utterances, especially interrogatives; proximity to the predicate and light verb constructions (Fry 2003; Lee and Song 2012);
    c. *pragmatics and discourse*: lower levels of formality (Hinds 1982; Kuno 1973; Lee 2006); absence of contrast (Fry 2003; Tsutsui 1984); construal as non-active topics excluded from f(ocus)-structure (Kwon and Zribi-Hertz 2008); minor topic shift and referent defocusing; communicating shared knowledge among discourse participants (Shimojo 2006).

Many of the above factors, while linked with the occurrence of null particles in corpus studies, represent non-categorical constraints that have been shown to predict the likelihood of particle omission, but do not always guarantee the occurrence of the null form. Given the diverse range of linguistic and extra-linguistic factors involved in licensing null particles, it is unsurprising that

native speakers show considerable variation and gradience in their use and acceptance of these forms (Fry 2003). Extensive variability in the baseline, reflexive either of gradience (as here) or of ongoing change, is often the root cause of systemic shifts in near-native grammars (cf. Torres Cacoullos and Travis [2015]; Montrul and Sánchez-Walker [2015] on pro-drop in Mexican Spanish and heritage languages based on it). Assuming our observations on the gradient nature of particle omission are on the right track, we expect this omission to be challenging for Korean bilinguals. The next subsection examines new experimental data that speak to this issue.

2.2 Topics and particle omission in Korean: Experimental study

The experimental data on the distribution of null topic particles in Korean that we present here illustrate one specific instantiation of the Silent Problem in bilingual speakers: difficulty in establishing and maintaining referential discourse dependencies under conditions of amplified ambiguity (which naturally arise when an overt linguistic marker is absent). Our results derive from a larger study on the subject-topic asymmetry in heritage and L2 acquisition of topic-prominent languages (Laleko and Polinsky 2013, 2016). Since the primary focus of this paper is on referential dependencies with null elements, we limit our present discussion to topic particle omissions. Our investigation is guided by the following questions: (i) do HL speakers and L2ers of Korean exhibit native-like distinctions between felicitous and infelicitous omissions?; (ii) do HL speakers demonstrate any advantages over L2ers; if so, in what specific contexts?

Our predictions for (i) and (ii) stem from the theoretical considerations discussed in Section 2.1 above, along with several relevant findings from previous studies. First, bilingual speakers often perform poorly on tasks that require discourse knowledge: adult L1 attriters, HL speakers, and L2ers have all been shown to experience increased difficulty in domains that engage the interface between grammatical and discourse-pragmatic knowledge (Hulk and Müller 2000; Sorace 2004, 2011; Sorace and Serratrice 2009; Tsimpli et al. 2004; Tsimpli and Sorace 2006; see also Müller [this volume]). Target-like use of null particles in Korean requires both grammatical and discourse-pragmatic knowledge; we therefore predict that near-native speakers may display non-target-like judgments of topic particle ellipsis. Next, under the assumption that null topic particles occur most frequently in colloquial speech and are relatively more restricted in formal and academic registers, we predict that HL speakers, whose

primary exposure to the target language takes place in an informal setting, may exhibit a global advantage over L2ers in recognizing acceptable and unacceptable contexts for these null particles. Since L2ers are typically exposed to the target language primarily through formal classroom instruction, their experience with the rules that govern particle omissions in the spoken language may be considerably limited. If context of acquisition (and particularly exposure to informal speech) is the only relevant factor at play, the hypothesized advantage of HL speakers over L2ers should be evident across the different functions of the topic marker. If, however, we observe that particle omissions in certain functions of the topic marker remain consistently challenging for HL speakers despite their exposure to colloquial registers, this pattern will require a more nuanced consideration of factors underlying the Silent Problem.

To anticipate the results presented below, we show that both HL speakers and L2ers fall short of the baseline ability to distinguish between felicitous and infelicitous topic particle omissions. This finding suggests that the Silent Problem affects speakers in both bilingual groups. However, HL speakers and L2ers show different patterns in their infelicitous judgments: L2ers exhibit across-the-board deficits with zero-marked topics (in both anaphoric and contrastive contexts), while HL speakers show a measurable advantage in contrastive contexts, where their ratings are similar to those obtained in the native speaker group.

2.2.1 Participants and methodology

Data for this study were collected from 35 HL speakers, 16 L2ers, and 15 monolingually-raised native speakers of Korean. The L2ers were exposed to the Korean language as adults in an educational setting and reported an average of 3.5 years of classroom exposure to the target language in high school and/or college. The HL speakers were exposed to Korean through interaction with family members at home while growing up and reported speaking exclusively or primarily Korean until approximately age 4. All bilingual participants completed a background questionnaire in their dominant language, which included self-ratings of their proficiency in Korean, as summarized below. The monolingual participants completed a version of the questionnaire, presented in Korean. Only the native speakers who reported Korean to be the only language of their daily communication were included in the control group.

All participants completed a scaled acceptability rating test (1–5 scale) on Amazon Mechanical Turk (see Sprouse [2011] for a detailed discussion of this data collection tool). The test included 56 sentences in the main experiment on

Table 1: Demographic information: Korean.

Group	HL (*N* = 35)	L2 (*N* = 16)	L1 (*N* = 15)
Mean age	24.5 (18–38)	25.8 (20–36)	22.4 (18–25)
Mean age of switch to English	3.9 (0–9)	n/a	n/a
Average daily exposure to Korean (%)	32.9 (5–65)	23.5 (1–85)	100
Self-rated proficiency in Korean (1–5)	4.35 (3–5)	3.39 (2–5)	n/a

null and overt particles and 84 filler sentences that served as an independent measure of language proficiency for all speakers.[2] The fillers were designed to test knowledge of several morphosyntactic and semantic properties of Korean grammar, which is typically achieved by speakers of advanced proficiency levels: semantic, morphological, and syntactic restrictions on the use of classifiers; use of scrambling; causative and dative constructions; conjunctions. Participants who performed at chance with respect to these properties (primarily from the L2 group) were excluded from data analysis for the main experiment; Table 1 above summarizes the relevant demographic details for the remaining participants of the study, who exhibited at-ceiling or near-celling performance across the grammatical constraints targeted by the fillers. All participants were compensated for taking part in the study, which took approximately 30 minutes to complete.

2.2.2 Predictions

To examine the phenomenon of topic particle omission in native, heritage, and L2 grammars, the experiment included 36 felicitous and infelicitous (#) Korean sentences containing null and overt topic particles, constructed in accordance with the factors in (10). Specifically, sentences containing null particles in the felicitous conditions conformed to the following restrictions: animate, definite or specific topic (e.g., proper nouns or nouns with demonstratives); the topic constituent occurring in relative proximity to the predicate; anchoring to speech time; canonical word order; casual style signaling low level of formality;

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2 All sentences in the experiment were presented visually on a screen. This presentation should be most natural for L2ers, whose experience is largely formal. For HL speakers, who often have little experience with literacy (Benmamoun et al. 2013; Montrul 2016), this mode of presentation limited the study to relatively proficient subjects. Nevertheless, as the pattern of results shows, we still found substantial differences between the native controls and the near-native speakers.

absence of contrast. Sentences with null particles in the infelicitous conditions lacked most or all of these characteristics. The experimental items were discussed and normed with four native speakers prior to the experiment. The experimental sentences were presented in the following conditions:

(11) a. null/null(#) topic particles
  b. overt/null(#) anaphoric topic particles
  c. overt/null(#) CT particles

We expected native Korean speakers to successfully differentiate between felicitous and infelicitous omissions of topic markers (cf. [9] above) and to identify infelicitous omissions in anaphoric contexts (12) and CT contexts (13):

(12) *Nauy chingwu Minswu-ya.*
  my   friend   Minsoo-DECL

  Minswu-nun/#Ø ilpon-ulo yuhak(-ul)   kal ke(s-i)-ya.
  Minsoo-TOP   Japan-to studying.abroad-ACC go will-COP-DECL
  'This is my friend Minsoo. Minsoo is going to Japan to study abroad.'

(13) *Pich-un/#Ø soli-pota   cenphas   okto-ka   ppalu-ta.*
  light-TOP   sound-than transmission speed-NOM fast-DECL
  'Light is faster than sound in transmission speed.'

However, as discussed above, the principles that govern particle omission in topic-prominent languages are diverse and non-categorical; hence, we also expected considerable gradience in native speakers' acceptability judgments (cf. the discussion of soft and hard constraints in Sorace and Keller [2005]).

To summarize, for native speakers, we expect the following:

(14) a. grammaticality effects (perception of contrast between in/felicitous conditions)
  b. gradience in judgments

With respect to the near-native groups, we predict the following:

(15) a. lack of perception of contrast between in/felicitous conditions
  b. lack of perception of the relevant contrast in anaphoric topics only
  c. lack of perception of the relevant contrast in CTs only
  d. gradience in judgments

(15a) would signal a global problem in speakers' knowledge of rules governing particle omissions; (15b) or (15c) would point to a more nuanced challenge with silent topic markers. In particular, problems with judging omissions in anaphoric topics could be related to difficulty with referential dependencies; problems with CTs could stem from difficulty in identifying contrastiveness.

2.2.3 Results

Results were analyzed using Welch's unequal variance t-test with a Bonferroni correction. First, we compare results in conditions targeting in/felicitous use of null topic particles. The mean ratings appear in Figure 1 for Korean monolinguals (L1), HL speakers, and L2 speakers. Only the native speakers showed a statistically measurable grammaticality effect ($t(124) = -2.2$, $p < .05$), despite demonstrating a gradient pattern of judgments typical of non-categorical constraints.[3] Speakers in both bilingual groups showed no similar distinction between likely and unlikely omissions in their ratings of null topic particles: HL speakers ($t(320.9) = -1.7$, $p > .05$), L2 ($t(130.0) = .3$, $p > .05$).

The inability of bilingual Korean speakers to differentiate between appropriate and inappropriate omissions signals greater uncertainty with contextual and pragmatic acceptability cues. These cues can vary; when they are weak,
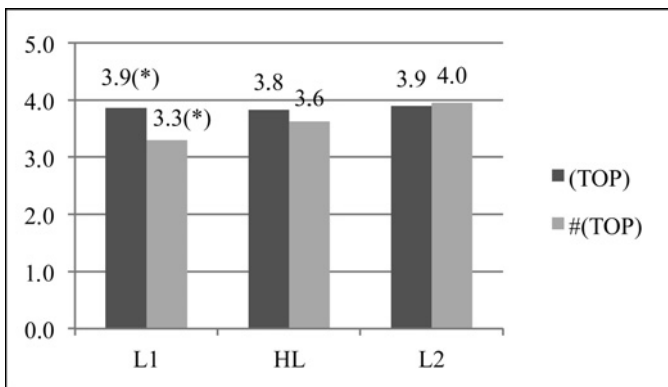

Figure 1: Mean ratings for felicitous and infelicitous (#) null topic particles.

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3 It is notable that the native speakers' ratings were not at ceiling even for sentences with topic particle omissions that were generally felicitous. Since the experimental stimuli were presented in a written form, this pattern of ratings may stem from a prescriptive bias against the use of null particles, associated primarily with spoken registers, in written language.

the demands on the comprehender's construction of referential dependency are higher. For anaphoric topics, interpretation is related to memory requirements: the parser must connect a particular expression to its prior mention in discourse. For CTs, interpretation calls for establishing a contrast set.
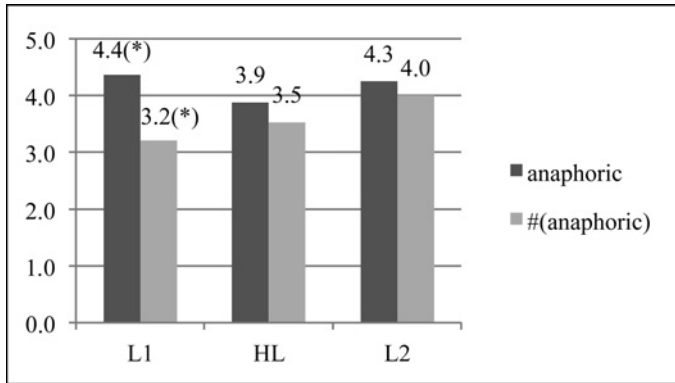

Figure 2: Mean ratings for overt and null (#) anaphoric topic particles.
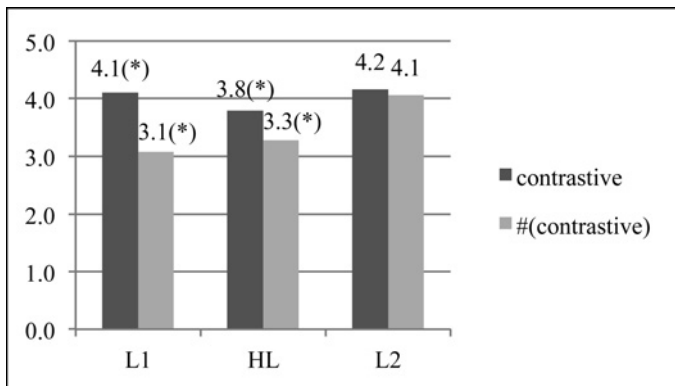

Figure 3: Mean ratings for overt and null (#) CT particles.

Given this difference in interpretation task, we considered anaphoric and contrastive topics as separate categories. The next set of conditions was designed so that in both anaphoric and contrastive contexts the overt particle was the more appropriate choice. Mean ratings for sentences containing null anaphoric topic particles (Figure 2) and CT particles (Figure 3) are compared to mean ratings for sentences in which these particles are realized overtly.

As predicted in (14), native speakers showed a statistically measurable grammaticality effect with overt and null particles both in the anaphoric ($t(127.7) = 4.27$, $p < .05$) and contrastive ($t(117.75) = 2.5$, $p < .05$) contexts. In both sets of conditions, the overt particles were preferred in the baseline group. However, the two bilingual populations made no similar distinction in rating anaphoric topics. No statistical differences in judgments of overt vs. null anaphoric particles were obtained for either group, HL speakers ($t(323.0) = .2$, $p > .05$) or L2ers ($t(134.8) = -.8$, $p > .05$).

Difficulty with CTs was detected only for L2ers. These speakers did not display target-like differences between overt and (infelicitous) null contrastive particles ($t(124.4) = .2$, $p > .05$) and significantly diverged from the native controls when rating unacceptable omissions of contrastive particles ($t(127.7) = -2.3$, $p < .05$). HL speakers, however, were indistinguishable from baseline speakers in their ratings of contrastive particle omissions ($t(316.9) = -.5$, $p > .05$); they diverged from L2ers in this condition ($t(321.5) = 2.1$, $p < .05$). The difference between null and overt CT particles was marginally significant in the HL speakers group ($t(346.4) = 1.96$, $p = 0.05$), yielding the same distinction as in the monolingual group.

The overall pattern of these results supports the often-touted premise that HL speakers pattern in some cases with native speakers and in some with L2ers (cf. Montrul [2008], [2016] for a general discussion). Remarking on these Janus-like properties of HL speakers is the first step; understanding which properties pattern in which direction is a much-needed next step. In what follows, we expand our discussion of the similarities and differences across heritage and L2 speakers with data from null subjects in Russian. The Russian results lend further support to the claim that HL speakers exhibit differential advantages over L2ers in contrastive contexts.

3 The Silent Problem in Russian: Null pronominals

In this section, we present empirical data on the distribution of overt and null pronominals in embedded clauses in Russian (a domain where Russian exhibits limited pro-drop). We start by describing the restrictions on the distribution of null and overt pronominal subjects in Russian, then present empirical data to demonstrate that both HL and L2 speakers of Russian show similar difficulties

in evaluating null embedded subjects. This finding corroborates the results of several previous studies that document bilingual speakers' systematic problems with producing and interpreting null elements in subject positions (see Ivanova-Sullivan [2014] for an overview). We then demonstrate a principled distinction between HL speakers' and L2ers' judgments of illicit subject omissions in contrastive contexts, a domain where HL speakers display an advantage over L2ers. No similar advantage is found in obviative contexts, which require co-reference with an extra-sentential discourse antecedent.

3.1 Background

Russian allows null pronouns in subject and object positions (King 1995; McShane 2005, 2009). However, unlike a prototypical pro-drop language, Russian permits these null pronouns only in certain embedded clauses. Null pronominalization is the preferred option in neutral contexts that varies with overt pronominalization, as in (16a). The preference for null versus overt pronouns has been linked to the discourse status of the subject, and in particular its recoverability or topicality (Franks 1995; Gordishevsky and Avrutin 2004). For example, an embedded clause subject may be overt or null in neutral indicative sentences when it represents a topic and is co-indexed with the subject of the matrix clause, as in (16).

(16) a. *Marina$_i$ skazala, čto (ona$_i$) ujezžaet.*
     Marina said   that she   leave.3SG
     'Marina$_i$ said that she$_i$ was leaving.'

   b. *Marina$_i$ skazala, čto ona$_{i/j}$ ujezžaet.*
     Marina said   that she   leave.3SG
     'Marina$_i$ said that she$_{i/j}$ was leaving.'

Embedded subjects in Russian obey several restrictions. First, an embedded subject must be overt in order to be interpreted as contrastive, as shown in (17a). The obligatory overt contrastive pronoun is associated with an LH boundary tone that signals the availability of alternatives (which may or may not be explicitly mentioned); this boundary tone is similar to the one observed in Korean CT environments and contrastive B-accent in English (Jackendoff 1972; Büring 2003). Second, embedded subjects in subjunctive clauses must be overt, as illustrated in (17b). This phenomenon is known as obviation, i.e., the require-

ment that the matrix and embedded subjects in a subjunctive clause be disjoint in reference (Avrutin and Babyonyshev 1997).[4]

(17) a. *Marina_i skazala, čto *(ONA_i) ujezžaet, a   ne Kolja.*
    Marina said   that she   leave.3SG but not Kolja.
    'Marina_i said that SHE_i, not Kolja, is leaving.'

   b. *Marina_i xočet, čtoby   *(ona_j) ujexala.*
    Marina wants that.SUBJ she   leave.SUBJ
    'Marina_i wants her_{j/*i} to leave.'

The distribution of null and overt subjects in monolingual Russian has been discussed in relation to a wide range of semantic, syntactic, and discourse-pragmatic factors; researchers are still searching for a common denominator that could bring together the accounts of this phenomenon (Miller and Weinert 1998; McShane 2005, 2009; Nichols 1985). In near-native speakers, cross-linguistic research points to an overuse of overt pronouns or overextension of their scope (Keating et al. 2011; Sorace and Serratrice 2009; Ivanova-Sullivan 2014). This trend is observed in both production and comprehension, suggesting that it is not just a function of some on-line deficit. Furthermore, overuse of overt pronouns is also observed in the input that HL speakers receive. In a pilot study, Dubinina and Polinsky (2013) observe that first-generation Russian immigrants to the U.S. and Israel use null pronominals at a much lower rate than their monolingual cohort in Russia. The similarity of the findings between speakers in the U.S. and Israel rules out language transfer as an explanatory factor: although English does not have null pronominal subjects, Hebrew does; thus, the loss of null forms is likely to follow from more general principles.

    What could trigger the loss of null pronominals? One explanation appeals to the underspecification of null elements and the potential ambiguity of gaps. Referents that are stored in working memory are often expressed by null forms (Gundel et al. 1993, 2012), so the silent form may represent the most economical option for native speakers. The unique demands on bilingual processing, however, may mean that, for non-native speakers, some cognitive resources that would otherwise be available for reference tracking are needed to fulfill other tasks (Sorace 2011: 23–24). If monolingual and bilingual speakers allocate cog-

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4 In such contexts, the non-obviative (control) reading is only possible with an embedded infinitival clause:
(i) *Marina xočet* [*PRO ujexat'*].
   Marina wants   leave.INF
   'Marina wants to leave.'

nitive resources differently, we could observe qualitatively opposite preferences for null and overt forms among these speaker populations. In particular, we may predict an under-use of null pronouns by near-native speakers, especially in contexts where both options are possible. This strategy may ultimately come with its own price tag: avoidance of null forms may lead to overall more relaxed judgments with respect to null pronouns, resulting in a fuzzier line between licit and illicit omissions.

The next section examines the validity of these considerations through an experiment on subject omission in Russian.

3.2 Russian null subjects: Experimental study

3.2.1 Participants and methodology

Data were collected from 27 HL and 20 L2 speakers residing in the U.S. and 15 monolingual speakers residing in Russia. All HL speakers reported being exposed to Russian at home while growing up, but switching to English as their main language of communication upon entering preschool. In contrast, all L2 speakers were introduced to Russian through formal academic instruction (average 3.2 years) in high school and/or college and reported using Russian primarily with teachers, classmates, and friends, but not with family members. Table 2 below summarizes the relevant demographic information about the participants.

Sixty acceptable and unacceptable (#) sentences were created to test the distribution of overt and silent subject pronouns in embedded clauses:

(18) a. overt/null, neutral indicative
    b. overt/null(#), contrastive
    c. overt/null(#), subjunctive

Table 2: Demographic information: Russian.

Group	HL (*N* = 27)	L2 (*N* = 20)	L1 (*N* = 15)
Mean age	19.3 (18–24)	19 (18-22)	24 (18–38)
Mean age of arrival	1.7 (0–7)	n/a	n/a
Mean age of switch to English	4.5 (0–7)	n/a	n/a
Daily use of Russian (%)	22.4 (5–45)	6.7 (1–20)	100
Self-rated proficiency in spoken Russian (1–10)	7.1 (4–10)	4.9 (2–8)	n/a
Self-rated proficiency in written Russian (1–10)	6.1 (4-10)	5.7 (2-9)	n/a

Additionally, 96 filler sentences probed other grammatical phenomena in several areas of syntax, morphology, and semantics. The sentences were randomized and presented visually on a screen; participants completed an untimed acceptability rating test (1–5 scale), which took approximately 30 minutes. Data from participants who performed at chance on fillers were excluded from further analysis.

3.2.2 Predictions

We expect native Russian speakers to demonstrate a preference for the null form in neutral indicative contexts such as (16a), where this form represents both the most economical and least marked option. Furthermore, native speakers should successfully differentiate between the un/acceptable conditions in (17): in particular, they should reject null pronouns in contrastive and subjunctive (obviative) sentences. To summarize these predictions:

(19) a. preference for the null form in neutral indicative statements
     b. perception of contrast between in/congruous conditions

Our predictions for the bilingual groups follow from the general assumption that null elements represent a likely locus of difficulty for bilingual speakers, but take into account the previously reported difference between anaphoric and contrastive readings. If the advantage demonstrated by the Korean HL speakers over L2ers in identifying illicit particle omissions in contrastive contexts is related to these speakers' greater facility with contrastive categories, then the Russian HL speakers in the present study may also exhibit greater accuracy in identifying unacceptable omissions in contrastive contexts. Thus, we predict that both bilingual populations will exhibit non-target-like rating patterns for null embedded subjects, but that HL speakers may do better with omissions under contrastive readings than L2ers. For the bilingual populations, we predict:

(20) a. lack of preference for the null form in neutral indicative statements
     b. advantage of HL over L2 speakers in contrastive contexts
     c. lack of perception of contrast between in/congruous omissions in obviative contexts

3.2.3 Results

Ratings were analyzed using Welch's unequal variance *t*-test with a Bonferroni correction. First, we examine overt versus null embedded subjects in non-emphatic contexts, as illustrated in (16a). The mean ratings for overt and null embedded subjects are presented in Figure 4.

The results reveal a clear difference between native speakers and HL speakers with respect to subject realization preferences in embeddings. Native speakers of Russian show a strong preference for null subjects, which they rate significantly higher than overt pronominals in the same positions ($t(80.34) = 3.47$, $p < .01$). In contrast, HL speakers exhibit a measurable trend in the reverse direction, rating overt pronominal subjects significantly higher than null forms ($t(151.9) = -4.86$, $p < .01$). The marked contrast between these two groups points to a systematic difference between the baseline and heritage grammars with respect to the distribution of overt and null subjects.

L2ers differ from both native and HL speakers in showing no significant contrast between null and overt subject conditions ($t(117.95) = -.6$, $p > .01$). This lack of clear judgment in the L2 group signals uncertainty with respect to the rules governing the distribution of null and overt forms, possibly as a result of delay in the acquisition of principles guiding anaphora resolution (Ivanova-Sullivan 2014; Rothman 2009). The lack of preference for overt subjects in L2 speakers is particularly striking, since it suggests that L1 influence from English does not enhance L2 preference for overt subjects.

Speakers in both bilingual groups show similarity in evaluating null subjects in embedded clauses, a position where the null form emerges as the preferred option for native Russian speakers. HL and L2 speakers pattern together
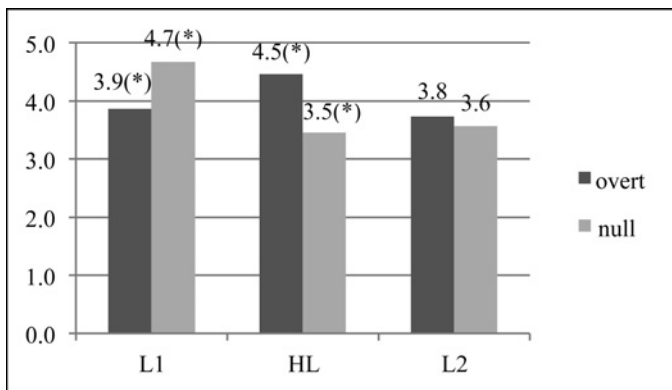

Figure 4: Mean ratings for overt and null embedded subjects in neutral indicative sentences.

(t(128.11) = −.44, p > .01) in across-group comparisons on the null subject condition, and both HL and L2 speakers diverge from the baseline group: HL (t(129.9) = −5.7, p < 0.01), L2 (t(97.2) = −4.8, p < 0.01).

Next, we turn to data from the two experimental conditions in which the embedded subject must be realized overtly: subjunctive clauses, where obviation is required, and contrastive clauses, in which a defined contrastive relationship holds between the subject of the embedded clause and another entity in the discourse. Figure 5 below presents the mean ratings for the null subjects in three conditions of the experiment: congruous omissions in neutral indicative statements, incongruous omissions in obviative (subjunctive) clauses, and incongruous omissions in contrastive contexts.

As predicted, the native controls demonstrate highly reliable statistical differences between acceptable null subjects and unacceptable null subjects in subjunctive contexts, (t(90.65) = 15.5, p < .01) and unacceptable null subjects in contrastive contexts (t(92.27) = 16.2, p < .01). By contrast, neither bilingual group exhibits a similarly categorical distinction between acceptable null subjects and illicit null subjects in subjunctive contexts: HL speakers (t(165.94) = 2.22, p > .01), L2 (t(117.31) = −.7, p > .01). We take this result to indicate reduced sensitivity to restrictions on the occurrence of null subjects under obviation in both bilingual populations.

A different pattern emerged in bilinguals with omissions of contrastively marked embedded subjects. Just like the native controls, HL speakers demonstrated a statistically reliable difference between acceptable omissions and unacceptable omissions in contrastive contexts (t(165.70) = 2.45, p = .01). However, L2ers made no similar distinction between acceptable omissions and
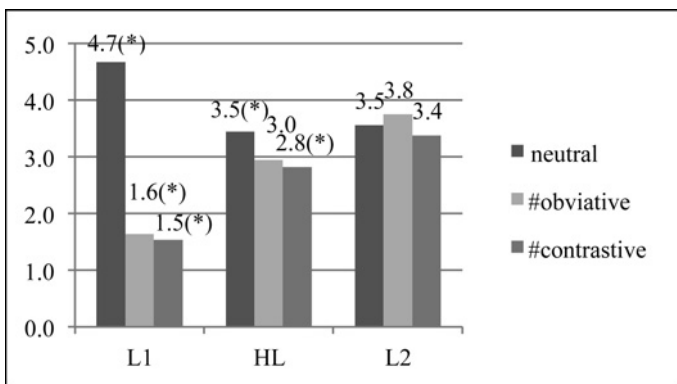

Figure 5: Mean ratings for null embedded subjects in neutral indicative, obviative, and contrastive contexts.

unacceptable omissions of contrastive subjects (t(117.87) = .67, p > .01). Taken together with the findings reported in Section 2, these results suggest that while the Silent Problem affects speakers in both bilingual groups, HL speakers nevertheless display a more nuanced judgment of omissions in contrastive contexts, one that is unavailable to L2ers.

4 Unifying the findings: Silence with anaphoric dependencies is more difficult

The studies discussed above examine the Silent Problem in two distinct groups of bilingual speakers: HL speakers and adult L2ers. Both experiments reveal a global difficulty with evaluating null forms employed for discourse reference tracking, despite the fact that the silent elements examined in the two studies pertain to different levels of representation: morphology (null topic markers in Korean) and syntax (null topical subjects in Russian).

At the same time, an important difference emerges between HL and L2 speakers in their knowledge of principles governing the occurrence of null forms. In both experiments, HL speakers demonstrated an advantage over L2ers in contexts where contrastive elements were omitted. In Korean, HL speakers were more successful in identifying illicit omissions of the CT particle, as in (13); in Russian, they were more on target in rating illicit omissions of contrastive subjects, as in (17a). By contrast, both bilingual groups showed similar difficulties in rating null forms in anaphoric contexts. Thus, (i) all our bilingual speakers experience difficulty with null elements in anaphoric dependencies, but (ii) HL speakers outperform L2ers in contrastive contexts. In what follows, we explore some possible accounts of these patterns.

Difficulty with anaphoric dependencies may stem from processing considerations. In particular, two independently motivated factors have been argued to exert pressure on working memory. First, establishing and maintaining *overt* anaphoric dependencies can be taxing when reference is ambiguous. Van Berkum et al. (2003) shows that processing referentially ambiguous NPs increases demand on memory resources in monolingual speakers; such effects are likely to be amplified in bilinguals whose cognitive resources are engaged across two simultaneously activated linguistic systems (Michael and Gollan 2005). Second, recovering the intended referent of a null element is independently associated with processing complexities (Frazier 2009). Both recovery of the silent category and association with an appropriate antecedent in discourse likely involve internal sub-processes: evaluating multiple possibilities; rejecting ungrammati-

cal or infelicitous options; selecting the most plausible alternative. The cumulative cost of these operations may explain bilingual speakers' increased difficulty with null anaphoric elements in referential dependencies, which have no additional cues available to reduce the demands on the comprehender.

Other factors that may affect bilinguals' mastery of constraints on omissions include dominant language transfer (Serratrice et al. 2004; Sorace 2004; Tsimpli et al. 2004), non-target-like mastery of pragmatic rules (Pérez-Leroux and Glass 1999; Rothman 2009, Ivanova-Sullivan 2014), and (for HL speakers) idiosyncratic properties of the baseline input grammar (Laleko 2010; Pires and Rothman 2009). While further studies are necessary to evaluate each of these factors experimentally, our data suggest some preliminary considerations. First, although all the bilinguals in our study were English dominant, unidirectional transfer from English does not provide a satisfactory account of the patterns in our data. Specifically, while problems in evaluating null topic particles in Korean could be tied to the absence of such particles in English, transfer-related effects cannot account for the over-acceptance of illicit null forms in Russian. As a non-pro-drop language, English employs overt pronominals in both contrastive and non-contrastive contexts, so unidirectional cross-linguistic transfer in this case only predicts an overuse of overt subjects. Second, it is not clear how the over-rating of illicit null forms could follow from the input properties of the HL. While the overuse of overt pronouns in neutral indicative contexts has been reported in Émigré Russian, no studies have documented infelicitous uses of *null* pronouns among this population. Since the HL grammar is determined to a large extent by the input received from caregivers, it is not surprising that HL speakers mirror adult émigré speakers in overusing overt pronouns in neutral non-emphatic contexts; it is less clear why increased availability of overt subject pronouns in the input alone would prompt HL speakers to be more accepting of illicit null forms.

Next, let us consider HL speakers' relative facility with contrastive pronoun omission versus anaphoric pronoun omission. Cross-linguistically, contrastive focus is typically signaled by prosodic prominence (Gundel 1999); accordingly, contrastive elements cannot be null, because null forms are unable to carry the necessary prosodic marking. Our data suggest that HL speakers of both Korean and Russian, like monolingual natives, are sensitive to this property.[5] The role of prosody in the processing of contrastive statements has been extensively documented (Braun and Tagliapietra 2010; Fraundorf et al. 2010; Ito and Speer 2008;

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5 It is well established that stress and intonation patterns are imposed on written language during silent reading (Ashby and Clifton 2005; Fodor 1998; Rayner et al. 2012; Stolterfoht et al. 2007). This suggests that the visually-presented stimuli in our study could have received implicit prosodic interpretation by our participants.

Mehlhorn 2004; Nakanishi 2001). Assuming that the acquisition of contrast is aided by the availability of prosodic cues in the input, HL speakers' relative advantage with contrastive categories may emerge as a result of prosodic bootstrapping, i.e., using the visible cues in the speech input as a starting point for forming and reinforcing the linguistic representations of associated categories, presumably due to these speakers' early, naturalistic exposure to the language.

If HL speakers are superior to L2ers in recognizing and deploying prosodic cues, a prosodic advantage can be added to the growing list of early-exposure benefits that can be further enhanced under instruction in the home language. Other researchers have emphasized that HL speakers stand out with respect to the native-like comprehension and production of phonetic/phonological segments (Au et al. 2008; Chang 2016) and tone (Chang and Yao 2016); prosodic benefits of early exposure are a natural extension of this pattern. However, prosody is present in all structures, and native speakers integrate it successfully in their reading even for neutral or default intonation contours. Meanwhile, the prosodic advantage enjoyed by HL speakers appears to be selective, in that HL speakers are sensitive to stronger, more salient prosodic cues: in the structures discussed above, these cues identify contrastive elements. This result is consistent with the experimental findings showing that HL speakers incorporate prosodic cues into on-line computation much less efficiently and quickly than monolinguals when processing split-word-order constructions (Sekerina and Trueswell 2011).[6] This suggests that the prosodic *defaults* in HL speakers may be more general than the defaults established by native speakers. This latter point warrants integration as a testable hypothesis in future studies.

5 Summary and conclusions

This paper examined two seemingly unrelated phenomena in typologically distinct languages: omissions of topic markers in Korean and null embedded subjects in Russian. These phenomena provide a solid common ground for comparative cross-linguistic investigations. First, both types of omissions offer unique perspectives on the specific manifestations of the Silent Problem in bilinguals. Second, both omission phenomena are characterized by apparent optionality, mediated by subtle but measurable pragmatic differences.

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6 Similar delays in the integration of contrastive pitch accent with visual cues are attested for monolingual children (Sekerina and Trueswell 2012). It remains to be seen how adult L2 learners of Russian would perform in a similar experiment; it seems likely that the use of prosody as an early disambiguation cue would be even more restricted for these speakers.

An important difference between the two phenomena discussed here concerns the status of the null form in the grammar of each language: in Korean, the relevant silent element – the topic particle – is morphological, while null subjects in Russian embedded clauses constitute a syntactic or discourse phenomenon. Apparent similarities in the behavior of null forms across these disparate levels of language architecture suggest that difficulties with silent elements are global in nature, not limited to morphology or syntax. Based on the findings reported here, we hypothesize that these difficulties reflect bilinguals' general difficulty with the construal of underspecified forms. It remains to be seen if monolingual speakers' ability to successfully deal with underspecification is related to the greater amount of input they receive in their language, or to the fact that their overall processing load is less than that of bilingual speakers, who must juggle multiple linguistic systems.

All told, these phenomena allow us to approach the Silent Problem from two distinct angles, bringing in data from typologically different languages to investigate the role of silent forms in near-native grammars. It is significant that both Korean and Russian near-native speakers had difficulty evaluating silent elements. However, it is also significant that heritage and L2 speakers of these languages differed systematically in their judgements. These results suggest that the Silent Problem should not be described with too broad strokes. To conclude this section, we would like to comment on a recurring theme permeating our discussion: the strong role of indeterminacy and ambiguity of silent forms as a source of difficulty for bilinguals.

To interpret silent categories, speakers must reinstate and evaluate the "missing" forms. While native controls easily recover omissions, near-native speakers struggle with such recovery, especially in contexts where the missing form may have multiple interpretive options. However, such challenges appear to lessen when ambiguity is reduced. For instance, under a contrastive reading, the illicit null form has no feasible interpretation and may be ruled out more efficiently. It is in precisely this context that HL speakers outperform L2ers. This difference between the two groups of bilinguals may have to do with HL speakers' early exposure to natural input which includes a richer array of segmental and prosodic cues.

It is possible that grammatical principles operative in native and near-native grammars may be qualitatively distinct (possibly as a result of the resource-allocating differences between these populations). The rating studies presented here were not timed, so observed difficulties cannot be reduced to a simple on-line challenge of limited processing resources. In fact, avoidance of null elements and difficulty in judging the acceptability of such elements may emerge as one of the defining properties of near-native grammars. If so, it may be

worthwhile to look for other instances where HL and L2 speakers systematically avoid null expressions or fail to recognize their misuse.

Finally, bilingual speakers seem to struggle with linking a given form, silent or overt, to its contextual antecedent. Resolving referential ambiguity forces the comprehender to keep a "running list" of candidates in working memory until a satisfactory interpretation can be achieved (Reinhart 2006). This task is further complicated in null structures, where the missing form must be recovered before it can be linked to context. In our view, this difficulty with linking is likely attributable to a memory problem: while native speakers may have enough resources to create and maintain discourse dependencies, such resources are more limited in near-native speakers, and this leads to their poor performance on anaphoric dependencies in particular.

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Abbreviations

COMP   complementizer
CT   contrastive topic
DECL   declarative
DEM   demonstrative
HL   heritage language
PRS   present
PST   past
SG   singular
SUBJ   subjunctive
TOP   topic