

Investigating the tense contrast in parasitic gap constructions: Experimental data from different varieties of French and Spanish

Gert-Jan Schoenmakers

Utrecht University

 ORCID ID: 0000-0002-0666-6001
g.t.schoenmakers@uu.nl

Luis Miguel Rojas-Berscia

Radboud University

 ORCID ID: 0000-0002-0492-9429
luismiguel.rojasberscia@ru.nl



How to cite: Schoenmakers, Gert-Jan & Luis Miguel Rojas-Berscia. 2026. Investigating the tense contrast in parasitic gap constructions: Experimental data from different varieties of French and Spanish. RLLT 24, eds. Janine Berns & Haike Jacobs. Special Issue of Isogloss. Open Journal of Romance Linguistics 12(2)/16, 1-31.

DOI: <https://doi.org/10.5565/rev/isogloss.536>

Abstract

It has often been observed that parasitic gaps fare better in untensed adjunct clauses than in tensed ones. García Mayo & Kempchinsky (1994) argue that this contrast emerges in Romance languages, but not in English. We present an acceptability judgment experiment to investigate the tense effect in different varieties of French and Spanish, and American English. While the main effects of tense and parasitic gaps in the Romance languages were significant, we did not find super-additivity. We did find super-additivity in the English data, although the experimental design prevents us from comparing the datasets. Our results do not support García Mayo & Kempchinsky's analysis. Furthermore, we compare our results with earlier experiments. We tested different language varieties for the sake of representation, but also because language contact with Germanic languages or Quechuan languages and Shawi may lead to transfer effects, reducing participants' sensitivity to the tense contrast compared to Metropolitan French and European Spanish. The patterns in the Spanish datasets corroborate this hypothesis. Finally, we find variation between the adjunct types we

tested in the Romance subexperiments (*after-*, *before-*, and *without-*clauses). Our findings thus provide an empirical basis for future research into the phenomenon.

Keywords: parasitic gaps, tense, adjuncts, experimental syntax, transfer, language contact.

1. Introduction

This paper experimentally investigates the acceptability of parasitic gap constructions and the oftentimes reported tense contrast in them, in varieties of French and Spanish, and in American English. Consider the Spanish sentences in (1), which illustrate such parasitic gap constructions.¹ The sentences contain two gaps: the first gap is located in the complement of *archivar* ‘file’ and forms a dependency with the *wh*-element *qué artículos* ‘which articles’ in first sentence position; the second gap is located in the complement position of *leer* ‘read’ in the adjunct clause. This second gap is ‘parasitic’ on the first gap, as the two share the same referent and because the acceptability of the sentence is dependent on the presence of the first gap (cf. the fully unacceptable *¿Qué artículos archivaste ese libro [después de leer ____]?* ‘which articles did you file that book after reading’, see e.g. Pañeda et al. 2020 for an experimental study on such so-called island constructions in Spanish).

- (1) a. ¿**Qué artículos** archivaste ____ [después de leer ____] ?
 ‘Which articles did you file after reading?’
 b. ¿**Qué artículos** archivaste ____ [después de que leíste ____] ?
 ‘Which articles did you file after you read?’

It has often been claimed that sentences such as (1a) are more acceptable than sentences such as (1b). This contrast is attributed to the presence of tense in the adjunct clause in (1b).² García Mayo (1994: 146) and García Mayo & Kempchinsky (1994: 303) argue that the tense contrast exists in Romance languages but is “notably lacking” in English. These two papers mention, however, that the literature on parasitic gaps in English provides conflicting judgments: Stowell (1985) argues that the tense contrast does not exist in English, while Frampton (1990) claims that it does. This disagreement is rather striking, as the tense contrast has consistently been reported for English since the 90s as well; Truswell’s (2011) analysis of the phenomenon, for example, is for the most part based on English data. Furthermore, experimental investigations of parasitic gaps in English confirm the language’s sensitivity to tense (e.g. Kurzman & Crawford 1991, Phillips 2006, Boxell & Felser 2017). By contrast, experimental data from the Romance languages are notably lacking. The first goal of the present paper is therefore to enrich the empirical dataset on the tense contrast with data from (different varieties of) French and Spanish. We describe García Mayo & Kempchinsky’s (1994) analysis

¹ We used a bold font type to highlight the extracted elements (*fillers*) and underscores to indicate their canonical positions (*gaps*) and will do so throughout the paper.

² We refrain from using judgment diacritics in this paper, because judgments reported in the literature may conflict and because these diacritics may affect the reader’s own judgment or general attitude (Schoenmakers & van Hout 2024b). Relevant differences between example sentences will instead be discussed in the accompanying text.

for the presence of the tense contrast in Romance parasitic gap constructions, as well as its absence in their English counterparts, in Section 2. Section 2 also discusses the conflicting judgments in the literature on English: the syntactic environments in which a parasitic gap can or cannot emerge are an important factor in the acceptability of the construction. Finally, we summarize earlier experimental results on parasitic gaps in various languages; as noted, data from the Romance languages are scarce. In addition to the Romance variants of our experiment, we ran an American English version to see if we would replicate earlier results. Section 2 concludes with our hypotheses.

Section 3 reports on an acceptability judgment experiment. It has become more and more common over the past three decades to employ formal experimental methods to test linguistic phenomena that fuel (generative) theoretical discussions (e.g. Schütze 1996, Sprouse 2007, Francis 2022). Considerable attention has been paid to individual differences between participants or experimental tasks (see e.g. Preston 2021: Chapter 4 and 5). Investigation of putative differences in the acceptability of morpho-syntactic phenomena between language varieties/speech communities, however, has been more restricted (Cornips & Corrigan 2005a/2005b, Adger & Trousdale 2007). This is in part because the phenomena under investigation often turn out to be relatively stable across varieties (Adger & Trousdale 2007), but also because modern generative approaches consider individual grammars – and not ‘societal’ grammars –, to yield variation: while individuals have distinct cognitive structures and linguistic experiences, the latter are taken to overlap to a greater extent when people live in the same general area (Cornips 2015).³ One consequence of this practice is that the empirical base of linguistic theory consists for the most part of standardized variants, while the ‘smaller’ or minoritized language varieties are often neglected (also because dialectal varieties are often harder to study, cf. Adger & Trousdale 2007). Potentially insightful variation patterns between language varieties may thus remain undiscovered. This paper therefore provides data from different varieties of French (*viz.* Metropolitan, Belgian, Canadian) and Spanish (*viz.* European, Peruvian-Lima, Cahuapanas).

Specifically, our experiment investigates the tense contrast in three languages by isolating the factors $\pm$ *tense* and $\pm$ *parasitic gap*. We compare the data patterns in the different varieties of French and Spanish. Regarding these varieties, we note that Belgian French and Canadian French are spoken in areas where Germanic languages are also spoken and similarly that Peruvian-Lima Spanish and Cahuapanas Spanish are spoken in areas where Quechua varieties and Shawi are also spoken.⁴ If García Mayo & Kempchinsky (1994) are correct and the presence of a tense contrast depends on the particular language (specifically Romance versus English), one might expect transfer effects to emerge, from languages lacking the tense contrast, in the varieties of French and Spanish we investigated. Further, we exploratorily analyze the patterns associated with the three tested adjunct types: *before*-, *after*-, and *without*-clauses. The results of our experiment are reported in Section 4. We address our hypotheses in more detail in Section 5, which contains general discussion. Section 6 concludes.

³ This is, of course, in contrast with Labov’s (1972, 1994) sociolinguistic approach that investigates syntactic phenomena as driven by the dynamics of particular speech communities.

⁴ No local variety of Quechua is currently spoken in Lima, although several varieties of Quechuan languages are spoken by migrants and, sometimes, their descendants as a heritage language. As we will argue in the discussion section, we surmise that competence in Quechuan languages has somehow influenced Lima Spanish, historically and synchronically.

2. Theoretical background

That tensed clauses are “by and large” more opaque than untensed clauses was already observed by Ross (1967: 27), who provides the examples in (2) to support his claim. Noting that certain cases of *wh*-extraction from a finite embedded question are “totally acceptable”, he suggests that sentences like (2a), where an element is extracted from an untensed clause, are usually more acceptable than sentences like (2b).

- (2) a. He told me about **a book** which I can’t figure out [how to read ____].
 b. He told me about **a book** which I can’t figure out [when I should read ____].

Less reluctance is shown in Chomsky’s (1973) *Tensed-S Condition*, according to which dependency formation across tensed clause boundaries is ruled out unless the filler and gap are both in COMP position (now specifier of CP). The generative theory this condition is associated with revolves around principles of locality: movement over clause boundaries can only happen in successive steps, and the specifier of CP is used as an ‘escape hatch’ to enable such cyclic movement. Although the Tensed-S Condition has been relabeled and developed into more elaborate theoretical framework since its original introduction, the contrast persists.

Sensitivity to tense in dependency formation has been a topic of discussions on parasitic gaps specifically as well. These discussions started with Engdahl (1983), who presented a tentative accessibility hierarchy for parasitic gaps where untensed domains were considered more transparent than tensed domains (see Culicover & Postal 2001 for a more recent overview of parasitic gaps research; see Tellier 1991 for French and Bordelois 1986 and VanDyne 2020 for Spanish). According to García Mayo (1994) and García Mayo & Kempchinsky (1994), however, the tense contrast in constructions with a parasitic gap exists in the Romance languages but not in English. When talking about this contrast, they refer to sentences such as (1), with a temporal adjunct (*before*- or *after*-clauses), which are arguably more transparent than other types of adjuncts (cf. Engdahl 1983). García Mayo & Kempchinsky (1994) claim that the English sentences in (3), unlike the Romance equivalents, are similar in terms of acceptability. We return to this particular claim in Section 2.2, after presenting their analysis in Section 2.1.

- (3) a. **Which articles** did you file ____ [after reading ____]?
 b. **Which articles** did you file ____ [after you read ____]?

2.1. Accounting for cross-linguistic variation

García Mayo & Kempchinsky (1994) argue that the difference between Romance and English is due to the nature of a null operator in the adjunct clause, which is commonly postulated to account for parasitic gap constructions, and its interaction with a second, temporal null operator. More specifically, Chomsky (1986) maintains that the filler in parasitic gap constructions (e.g. *which articles* in (3)) originates in the matrix clause (in the complement of *file*), and that there is a null operator in the adjunct clause. This null operator moves into the specifier of the adjunct CP so as to enter into a licensing

relation with the overt filler (via successive movement into higher specifiers of CPs).⁵ In order to explain the contrast between Romance and English, then, García Mayo & Kempchinsky (1994) need to make one adjustment and call on one additional element.

First, García Mayo (1993) claims that the null operator in Romance languages does not *move* into the specifier of the adjunct CP but is *generated* in this position; it then receives its index through a structural relationship (specifically, head-government and co-indexation) while the lower object is *pro* (after Cinque 1990). Second, García Mayo & Kempchinsky (1994) assume, following Geis (1970) and Larson (1990), that *before*- and *after*-clauses contain a null temporal operator which binds a variable in the adjunct – operators they call *Geis operators*. The Geis operator can be used to explain the ambiguity of English sentences such as *Liz left before you said she had*, as the Geis operator can be generated in two distinct positions (before moving to the edge of CP), see (4).

- (4) a. Liz left [_{PP} before [_{CP} **Op_G** [_{IP} you said [_{CP} she had] ____]]]
 ‘Liz left before the time of your saying she left.’
 b. Liz left [_{PP} before [_{CP} **Op_G** [_{IP} you said [_{CP} she had ____]]]]
 ‘Liz left before the time which you said she had left at.’

García Mayo & Kempchinsky (1994) argue that Geis operators can only adjoin to adjunct CPs in Romance,⁶ because they had assumed that the specifier position is already filled (after García Mayo 1993). However, the resulting configuration violates *Subjacency* (Chomsky 1973/1977), a condition that constrains dependency formation over more than one blocking category (i.e. *bounding nodes* in Chomsky 1973, *barriers* in Chomsky 1986, *phase boundaries* in Chomsky 2001/2008). Yet, in the structure in (5) there are two blocking categories between the lower null operator *Op_i*, which is co-indexed with the parasitic gap, and its potential identifier (*qué artículos*): the adjoined CP with the Geis operator (*Op_G*) located at its edge and the *después* PP. Thus, this sentence violates Subjacency and is rejected. Note that a sentence with an untensed adjunct is taken not to violate Subjacency, because they do not contain an embedded CP (i.e. only PP is a blocking category).

- (5) **Qué artículos** archivaste ____ [_{PP} después de [_{CP} **Op_G** [_{CP} *Op_i* que [leíste *pro_i* _____G]]]]

García Mayo & Kempchinsky (1994) propose that the Geis operator in English, by contrast, first moves to the adjunct’s specifier of CP, and it is the parasitic gap null operator that adjoins to CP, as in (6). Note that the two operators in (5) crucially appear in the reverse order of (5). Now the only blocking category between the *wh*-phrase and *Op_i* is the adjunct PP, and so the sentence is grammatical and acceptable.

⁵ Alternative accounts of parasitic gap constructions can be found in e.g. Kayne (1983), Cinque (1990), Frampton (1990), Postal (1993), Manzini (1994) and Nissenbaum (2000).

⁶ Adjunction to the specifier of CP is not technically possible in the Barriers framework (Chomsky 1986). Adopting Frampton’s (1990) analysis, García Mayo & Kempchinsky (1994: 312) argue however that “the prohibition against adjunction to both IP and CP can be dispensed with entirely” (see the references for details).

- (6) **Which articles** did you file ____ [PP after [CP **Op_i** [CP **Op_G** [you read _____i _____G]]]]

Finally, García Mayo & Kempchinsky (1994) present the sentence pair in (7), in which (7b) is argued to be less acceptable than (7a), to show that *without*-clauses in Romance show the tense contrast as well (dependency formation in tensed domains is associated with lower acceptability). Note that this structure is unavailable in English for independent reasons (see Truswell 2011 for more discussion). On García Mayo & Kempchinsky's account, the pattern in (7) suggests that the Geis operator can emerge in non-temporal clauses as well, or that a similar null operator exists for circumstantial adjuncts (as in Bhatt & Pancheva 2006: 656ff. for conditional clauses). However, the ambiguity in (4) does not exist for *without* clauses. Moreover, Dutch – a Germanic language that, unlike English, has tensed and untensed *without* clauses, displays the tense effect in *without*-clauses (Coopmans et al. 2025), and so a revision of García Mayo & Kempchinsky's (1994) analysis might be necessary (at least for Dutch).

- (7) a. **Qué artículos** archivaste ____ [sin leer ____ detenidamente]?
 'Which articles did you file without reading carefully?'
 b. **Qué artículos** archivaste ____ [sin que los estudiantes leyeran ____ detenidamente]?
 'Which articles did you file without the students reading carefully?'

2.2. Experimental papers test different structures

García Mayo & Kempchinsky's (1994) analysis relies on the premise that English does not exhibit the tense contrast. Indeed, in the first systematic investigation of parasitic gap constructions, Engdahl (1983: 9) argues in line with García Mayo & Kempchinsky that "[English] temporal clauses appear to be pretty accessible parasitic gap domains, regardless of whether they are tensed or not." Discussing parasitic gaps in embedded clauses, however, Engdahl (1983: 11) observes that "at least for English, the distinction between untensed and tensed domain is important for determining the likelihood that a parasitic gap will be acceptable." The syntactic environment of the parasitic gap may thus play a crucial role with regard to the acceptability of the structure.

Phillips (2006) and Boxell & Felser (2017) experimentally tested parasitic gaps inside English complex subject clauses, see (8) and (9).⁷ Coopmans et al. (2025) tested parasitic gaps in Dutch *without* clauses, see (10). Each of these experiments yielded a significant tense contrast, but García Mayo & Kempchinsky's (1994) claims appear to mainly target parasitic gaps inside temporal adjuncts.

⁷ Chapman et al. (2014) tested the processing of parasitic gaps inside (untensed) English *after* clauses and inside (untensed) complex subject clauses in an eye-tracking study. They find that verbs preceding the real gap were processed faster and received higher acceptability scores in items with an adjunct than in those with a subject parasitic gap, and participants were more likely to regress out of subject constructions. While Chapman et al.'s findings imply that there is a certain processing advantage in English for parasitic gap constructions with temporal adjuncts as compared to complex subject clauses, they did not test the tensed counterparts of their stimuli.

- (8) Phillips (2006: 805)
- a. The outspoken environmentalist worked to investigate **what** [the local campaign to preserve ____] had harmed ____.
 - b. The outspoken environmentalist worked to investigate **what** [the local campaign that preserved ____] had harmed ____.
- (9) Boxell & Felser (2017: 499, their (13e–f))
- a. It was not clear **which animals** [the plan to look after ____] would protect the ____.
 - b. It was not clear **which animals** [the plan that looked after ____] would protect ____.
- (10) Coopmans et al. (2025: 15, 23; their (16b) and (18b))
- a. **De stad** heeft hij [zonder ____ te bezoeken] ____ beoordeeld.
'The city, he reviewed without visiting.'
 - b. **De stad** heeft hij [zonder dat hij ____ bezocht] ____ beoordeeld.
'The city, he reviewed without having visited.'

Kurzman & Crawford (1991) tested parasitic gaps in English temporal adjuncts as well as in subjects with a clausal complement, with tensed and untensed extraction domains. They report the tense effect for both experiments (*pace* Engdahl 1983, García Mayo 1994, García Mayo & Kempchinsky 1994), as reflected in fewer “grammatical” judgments as well as in increased reaction times for parasitic gaps in tensed domains. Kurzman & Crawford argue that the sentence pair that Engdahl (1983) originally used to claim that English does not exhibit the tense contrast in sentences with a temporal adjunct in (11) is problematic, because the verb *eat* can also be used intransitively, and because of the semantic similarity between the lexical items in the sentence, which may override syntactic processing difficulties (Ratcliff 1987).

- (11) Adapted from Engdahl (1983: 9)
- This is **the kind of food** you must cook ____ {before eating ____ / before you eat ____}.

Thus, the premise that English does not show the tense contrast in constructions with a parasitic gap inside a temporal adjunct seems to be flawed from an experimental perspective. Because of the discrepancy between Kurzman & Crawford’s experimental study and the claims in the theoretical literature we also include an (American) English version of our experiment in this study.

Experimental data for the Romance languages are scarce. As far as we know, the only paper that reports Romance data is dal Farra (2019). Dal Farra tested the tense contrast in Italian *before*, *after*, and *without* clauses. Her results indicate that parasitic gaps in untensed clauses are more acceptable than parasitic gaps in tensed clauses, in line with García Mayo (1994) and García Mayo & Kempchinsky (1994). Although dal Farra notes that the three adjunct types might show differences in their transparency, she does not statistically compare them in her analyses. Therefore, in our experiment,

we collected data from (varieties of) French and Spanish to test the tense contrast, and we exploratorily investigate the putative differences between the three clause types in these languages, in Section 4.4.

2.3. Testing different language varieties

We tested different language varieties in our experiment for purposes of representation. A second reason to include different language varieties is that language transfer effects may occur in the datasets, due to language contact. That is, cases of syntactic transfer due to language contact have been reported for Belgian and Canadian French. Treffers-Daller (2012) shows that speakers of French in Brussels use Belgian Dutch collocation forms, consisting of a verb and a preposition or adverb, in their French (e.g. *chercher après* ‘search for’ – even though the verb *chercher* ‘search’ is transitive in Metropolitan French). Moreover, Treffers-Daller compares this Belgian French pattern to the pattern Mougeon et al. (2005) report for Canadian French spoken in Ontario: Canadian French collocations rather resemble the English translations of these forms (e.g. *chercher pour* ‘search for’). Canadian English and Belgian Dutch thus influence syntactic patterns in the local varieties of French. So, if the claim in García Mayo & Kempchinsky (1994), that English does not display the tense contrast (in temporal adjunct clauses), is correct, we might expect differences between the varieties of French (Metropolitan, Belgian, and Canadian French). More specifically, the tense effect might be weaker in Canadian and Belgian French than in Metropolitan French because of language contact with (the local varieties of) English and Dutch (another Germanic language).

Differences between European and American varieties of Spanish may also be linked to language contact and transfer effects. Varieties of Peruvian Spanish are often influenced by Quechuan languages (Escobar 2001). Morphosyntactic borrowings from these languages into the local varieties of Spanish include different gender agreement patterns, cases of article deletion, and doubly-marked genitives (e.g. *su papa de él* lit. ‘his father of him’, Sánchez 1996). As far as we can tell, there are no papers on parasitic gaps in Quechua. However, Sánchez (2004) argues that tense features in Quechua and Spanish are associated with different other features in the IP complex: with aspectual features in Spanish, with evidentiality features in Quechua (cf. Escobar 1994). Sánchez observes that older Quechua-Spanish bilingual children use imperfective morphology more often in a story-retelling task than Spanish monolingual children when they were asked to express hearsay information. Moreover, the former group changed fewer past perfective forms into imperfective or pluperfect forms in their reproductions. Thus, it appears that Spanish tense markers are interpreted and/or realized in a slightly different way by the Quechua-Spanish bilinguals than by the monolingual speakers of Spanish. Escobar (1994: 38) similarly concludes, based on her speech recordings with Quechua-Spanish bilinguals, that “the Bilingual epistemic system [...] extends the meanings of the Spanish verbal forms to convey more general meanings.” The alternative meanings conveyed by tense morphology might also affect the sensitivity of Peruvian-Lima (and Cahuapanas) Spanish speakers—who are in close contact with Quechua (and Shawi) – to the tense contrast, such that they show a pattern different from European Spanish speakers.

As alluded to above, we also tested speakers of Cahuapanas Spanish, which is a variety of Spanish that is spoken by the Indigenous Shawi of Peruvian Northwestern Amazonia. Specifically, we tested the variety spoken by the inhabitants of Santa Maria

de Cahuapanas. This region is of particular interest, since it has been an area of intense language contact, which resulted in language mixing practices (between Amazonian Spanish and Shawi as well as between Awajún (Chicham) and Shawi). Cahuapanas is the only region where coordinated Spanish-Shawi bilinguals are found – that is, the speakers acquired Spanish from early childhood in everyday life. In most other regions, Spanish is learned at a later stage in life, at school or in early adulthood (Rojas-Berscia 2021, Rojas-Berscia et al. 2022). There is reason to believe that Shawi influences the local variety of Spanish: in Shawi, temporal adjunct clauses must carry a person-marking index that agrees with the subject of the matrix clause, see (12). This mechanism establishes co-reference between the subject of the matrix verb and of the verb in the adjunct clause.

(12) Shawi (Kawapanan)

- a. ¿Ma'-ta pa'a-n-an nanin sahka-te-r-an-su-ke-ran?
 what-CNTRST buy-REAL-2 already work-VAL-REAL-2-NMLZ-LOC-ABL
 'What did you buy after working/after you worked?'
- b. ¿Ma' kirihka-ta tahpa-r-an ku nun-teya'-te-ra-(p)-a-su'?
 what book-CNTRST put.away-REAL-2 NEG read-throw-VM-PROG-IRREAL-2-
 NMLZ
 'What book did you put away without reading/before you read?'

In (12a), the temporal adjunct clause is a nominalization where the nominalizer suffix *-su* (see Rojas-Berscia 2019) optionally surfaces. This nominalization is subject-indexed with *-an*, which signals that it has the same subject as the matrix verb, that is, there is no switch-reference. Similarly, the adjunct clause *ku...-su* 'without ...-ing' in (12b) requires person-agreement marking to signal co-reference of the subjects. Note that the *-su* suffix only attaches to tensed forms. Untensed forms form nominalizations with strong nominalizers, like the agentive suffix *-napi* (Rojas-Berscia 2019), but these are not used in the same contexts as the untensed forms in European languages. Thus, it could be the case that speakers of Cahuapanas Spanish conceptually map the Shawi structures onto Spanish sentences and thereby resort to Spanish-internal means (tense marking) to express co-referentiality (for which Shawi has specific morphology). The sentence in (13) would then appear tensed on the surface but would merely be person-marked in the bilingual mind of the Cahuapanas Spanish speaker. The tense contrast would consequently disappear for these speakers, as they do not distinguish between the two forms in the same way European Spanish speakers do: for them, tense only marks co-referentiality in these sentences and should consequently not be an obstacle in the same way it is for speakers of European Spanish. Thus, they may accept both sentences with a parasitic gap inside an untensed clause and sentences with a parasitic gap inside a tensed clause.

(13) Cahuapanas Spanish

- ¿Qué libros guardaste antes de que leíste?
 'What books did you put away before reading/before you read?'

This rationale holds for Peruvian-Lima Spanish as well: despite being regarded as the national standard and a symbol of purity and culture (Caravedo 1989), Peruvian-

Lima Spanish has been in contact with Quechua and other Indigenous languages since colonial times (Quintanilla Anglas 2002). Beyond the evident lexical imprint found in day-to-day speech, syntactic phenomena of Quechuan origin (sometimes referred to as ‘Andean Spanish’) occur rather frequently. As noted, Southern Quechuan linguistic varieties (like Shawi) require person-agreement markers in temporal adjunct clauses, see (14).

(14) a. Southern Quechua⁸

Ima	liwru-ta-taq	chura-rqa-n-ki	ñawincha-spa-yki
what	book-ACC-CNTRST	put.away-PERF-REAL-2	read-SEQ-2

‘What book did you put away after you read?’

b. Central Quechua (Wanka), Cerrón-Palomino (1976: 271)

Puñu-ykaa-sha-n-piqta-m	likcha-qlu-n-Ø
sleep-DUR-SEQ-3-ABL-EV	wake.up-EDUC-REAL-3

‘He/she woke up after having been sleeping.’

In (14a), a subject agreement marker *-ki* is present in the matrix clause and in the temporal adjunct clause (*-yki*). The sequential marker *-spa* is a weak nominalizer and thus requires the co-occurrence of person-marking suffixes. Sentence (14b) comes from Wanka Quechua, a variety spoken relatively close to the Peruvian metropole. The adjunct clause, a consecutive subordination, is formed via an ablative nominalization (cf. the Shawi example in (12a)). As such, person-marking suffixes are necessary to index co-reference. We may thus not find the tense contrast in Peruvian-Lima Spanish or Cahuapanas Spanish, or these variants might show weaker contrasts than European Spanish, due to language contact: Quechua-Spanish bilinguals interpret tense features differently from Spanish monolinguals (Escobar 1994, Sánchez 2004) and, in the case of parasitic gap configurations, they might reanalyze Spanish tense as person-marking morphology.

2.4. Hypotheses

We present four hypotheses. The first two hypotheses are based on the claims in García Mayo (1994), García Mayo & Kempchinsky (1994), and Engdahl (1983) (for English).

H1. The tense contrast is reflected in acceptability judgments from French and Spanish speaking participants for constructions with a parasitic gap inside an adjunct.

H2. The tense contrast is **not** reflected in acceptability judgments from American English speaking participants for constructions with a parasitic gap inside a temporal adjunct.

⁸ According to Cerrón-Palomino (2008: 148), person-marking in *-spa* temporal adjunct clauses is specific of only some Southern Quechuan varieties, like Ayacucho Quechua, in (i).

(i) *mikhu-spa-y* *hamu-n-i*
eat-SEQ-1 come-REAL-1
‘I’ll come after eating.’

Notice that the adjunct type is specified in H2, but not in H1. The reason for this is that the claims about English are restricted to temporal adjuncts (Engdahl 1983). Moreover, English does not have tensed *without*-clauses. In the French and Spanish versions of our experiment, we tested *after*-, *before*-, and *without*-clauses, and we explore potential differences between these types in Section 4.4.

Our third and fourth hypotheses pertain to the language varieties we tested. H3 asserts that the tense contrast is weaker in Belgian French and Canadian French than in Metropolitan French, because Germanic languages are spoken in these countries as well. H3 crucially depends on the outcome of H2, however, seeing as transfer effects are only expected when the languages have distinct syntactic properties. If English, like French, exhibits the tense contrast (contra H2), we no longer expect it to be weaker in the other French varieties (H3). As for H4, we expect the tense contrast to be weaker in the American Spanish varieties than in the European variety, because of language contact with Quechuan (Peruvian-Lima) or Shawi (Peruvian-Cahuapanas) – languages in which co-reference markers in temporal adjunct clause are common.

H3. The tense contrast is weaker for speakers of Belgian and Canadian French than for speakers of Metropolitan French.

H4. The tense contrast is weaker for speakers of Peruvian-Lima and Peruvian-Cahuapanas Spanish than for speakers of European Spanish.

3. Experiment

We created three versions of the acceptability judgment experiment, one for each of the languages under investigation.

3.1. Participants

Participants were recruited via the researchers' personal networks, social media groups dedicated to questionnaire distribution, the RISC mailing list (French), former Shawi linguistic assistants in the Amazon (Cahuapanas Spanish), and Prolific. The last group received financial compensation for their time.

The French version of the questionnaire was completed by 137 participants. We removed data from participants whose average ratings for the grammatical and/or ungrammatical fillers were below 40 or above 60 (on a 100-point scale), and/or with a difference between the filler types of less than 10 points, including 'flipped' responses ($n = 2$). Data from a total of 135 French speakers were entered into statistical analysis. Specifically, we analyzed data from 43 Belgian French speakers (age $M = 30.8$, $SD = 12.3$, range 18–75), 39 Canadian French speakers (age $M = 33.2$, $SD = 8.6$, range 21–63), and 53 Metropolitan French speakers (age $M = 39.6$, $SD = 16.9$, range = 18–79).

The Spanish version of the questionnaire was completed by 103 participants. We removed data from participants who gave unexpected ratings to the filler items (see the criteria above, $n = 5$). We entered data from 98 Spanish speakers into statistical analysis; from 41 European Spanish participants (age $M = 34.1$, $SD = 15.5$, range = 19–75), 40 Peruvian-Lima Spanish participants (age $M = 38.7$, $SD = 14.7$, range = 21–

68), and 17 Cahuapanas Spanish participants (age $M = 33.8$, $SD = 8.8$, range = 19–53).⁹

The English version of the experiment was completed by 25 native speakers of American English (age $M = 30.9$, $SD = 8.6$, range = 17–52). We did not have to remove data from participants based on their responses to the filler material.

3.2. Materials

We created 20 stimulus items, designed according to a 2×2 design crossing the factors $\pm$ *tense* (T) and $\pm$ *parasitic gap* (PG). A sample item is given in (15) for French, (16) for Spanish, and (17) for English. The sentences were presented to participants without the underscores indicating the gap site(s) nor the brackets indicating the adjunct clause boundaries. All items were interrogative clauses with a *wh*-phrase in the first sentence position, which was the direct object of the matrix verb following it, followed in turn by a second-person pronoun subject (except in Spanish sentences, in which the subject was expressed through verbal inflection only), and by a clausal adjunct. These adjuncts were *after*- and *before*-clauses in all three languages, in addition to *without*-clauses in French and Spanish. The adjuncts contained a tensed or untensed verb (*passé composé* in French, *préterito* in Spanish, simple past in English) and did or did not contain an overt direct object (i.e. the *parasitic gap* manipulation). In the example sentences, the conditions in (b) and (d) do not contain a gap site in the adjunct and are syntactically unmarked. The conditions in (a) and (c), by contrast, contain a gap site in the adjunct; these conditions differ in that the embedded verb is untensed in the (a)-sentences but tensed in the (c)-sentences. According to the tense contrast, then, the acceptability of the (c)-sentences should receive the lowest acceptability ratings.

- (15) a. Quel chien as-tu sorti ____ [après avoir caressé ____] ? [–T, +PG]
 b. Quel chien as-tu sorti ____ [après avoir caressé le chat] ? [–T, –PG]
 c. Quel chien as-tu sorti ____ [après que tu as caressé ____] ? [+T, +PG]
 d. Quel chien as-tu sorti ____ [après que tu as caressé le chat] ? [+T, –PG]
- (16) a. ¿Qué perros paseaste ____ [después de acariciar ____] ? [–T, +PG]
 b. ¿Qué perros paseaste ____ [después de acariciar a los gatos] ? [–T, –PG]
 c. ¿Qué perros paseaste ____ [después de que acariciaste ____] ? [+T, +PG]
 d. ¿Qué perros paseaste ____ [después de que acariciaste a los gatos] ? [+T, –PG]
- (17) a. Which dog did you walk ____ [after petting ____] ? [–T, +PG]
 b. Which dog did you walk ____ [after petting the cat] ? [–T, –PG]
 c. Which dog did you walk ____ [after you petted ____] ? [+T, +PG]
 d. Which dog did you walk ____ [after you petted the cat] ? [+T, –PG]

⁹ The number of Cahuapanas Spanish participants is considerably lower than that of the other participant groups, which impedes statistical power (Brysbaert 2019). However, it must be highlighted that the Shawi population consists of only ~30.000 individuals, which makes it one of the largest communities in the Peruvian Amazon. Note that the city of Santa María de Cahuapanas where this variety is spoken has a population of only 962 people, according to the 2017 census. Further, recruiting Shawi participants for online experiments is a rather difficult task due to the lack of steady internet access.

The 20 items were distributed over four experimental lists according to a Latin Square design, to which 25 grammatical and 15 ungrammatical fillers were added. The ungrammatical fillers contained agreement errors. In the end, a total of 60 items were pseudorandomized in two distinct item orders per experimental list, using the software *Mix* (van Casteren & Davis 2006).

Before we proceed, several notes are in order with regard to the item sets. First, we stress that the three item sets were **not** direct translation equivalents of each other. Because we are testing an Indigenous variety of Spanish, we adapted the items to be pragmatically coherent with Indigenous (Shawi) linguistic ecology. That is, testing the Spanish version of the item *Which car did you drive before damaging the CD player?* in the group of Shawi speakers, for example, could jeopardize the ecological validity of our experiment, because Shawi speakers do not necessarily use cars with or without broken CD players as much as speakers of e.g. European Spanish. Furthermore, since tensed circumstantial adjuncts (*without* clauses) do not exist in English, the English item set only contained temporal adverbs. Specifically, the English item set contained ten adjuncts headed by *after* and ten headed by *before*. The French set contained eight *après* ‘after’, five *avant* ‘before’, and seven *sans* ‘without’ adjuncts; the Spanish set contained eight *después* ‘after’, six *antes* ‘before’, and six *sin* ‘without’ adjuncts. Because of these differences between item sets, we will not include *language* in an interaction term to compare the patterns emerging from our experiment *between the languages* (cf. Gelman & Stern 2006). Instead, we will include quantitative comparison of the data patterns *within the languages* based on the 2×2 design, as well as quantitative comparison of the *language varieties* (Metropolitan vs. Canadian vs. Belgian French; European vs. Peruvian-Lima vs. Cahuapanas Spanish).

Second, there were two grammatical mistakes in the French items. First, the past participle in seven items did not agree with the direct object even though the direct object preceded it (for example, the item in (18) erroneously uses masculine singular *mangé* ‘ate’ instead of feminine plural *mangées* ‘ate’).¹⁰ Second, the subject pronoun *tu* is usually realized as the reduced form *t’* in colloquial (Metropolitan) French. Subject-verb inversion consequently should not take place, since “*wh-ex-situ* questions with [subject-clitic inversion] belong exclusively to Standard French,” as Faure & Palasis (2021: 64) put it. While this is not problematic for our items per se, the experimental task did ask participants to imagine an informal situation (see Section 3.3) before providing their judgment, and so the items were arguably pragmatically infelicitous.

- (18) Quelle pomme as-tu mangé sans éplucher ?
 ‘Which apple did you eat without peeling?’

¹⁰ An anonymous reviewer suggests that one may expect these items to be rated as bad as the fillers, because those items also contained agreement errors. This was not the case; these faulty items received much better ratings. However, the type of agreement error is different between these items and the fillers: the former contained a spelling error that is commonly overlooked in writing (see e.g. Brissaud 2013), whereas the latter contained agreement errors with the verb that lead to distinct pronunciations and interpretations (e.g. *Quel oiseau t'intéressons ?* ‘Which bird interest.3PL you.2SG?’).

Both issues, however, apply to all conditions equally. That is, all variants of the item in (15) contain full subject forms triggering inversion with the verb, and the seven items lacking obligatory agreement of the past participle do so in all four conditions. The issues are therefore not expected to interfere with the experimental manipulations, and our results may still inform linguistic theory.

Finally, one of the conditions in a Spanish item and one condition in three French items contained typographical errors. These were removed prior to statistical analysis.

3.3. Procedure

After receiving general information about the experiment and providing consent, participants were instructed to locate themselves in an environment free of noise or other distractions when doing the experiment. They were asked to evaluate a set of sentences, each of which was presented on a new screen. Following Schütze & Sprouse (2014), we asked participants to imagine that a native speaker of their language whom they know well (e.g. a close friend) would produce the sentence, and to subsequently rate its naturalness. Participants were moreover instructed to rely on their intuition, as there were no right or wrong answers. Finally, they were told that we are interested in sentence structure, not in the meaning of the individual words.

Naturalness ratings were collected on ‘blind’ 100-point slider scales, i.e. the numeric values corresponding to participants’ responses were not visible to them. The slider bar was set at 50 and had to be moved in order to proceed with the experiment. At the very end of the experiment, participants could provide qualitative comments.

The experiment was conducted in Qualtrics and received approval from the Ethics assessment committee of Radboud University (application code 2024-8501).

3.4. Analysis

For each data set, we z-transformed the raw scores using all items, before performing linear mixed-effects models on the standardized scores, using the *lme4* package (Bates et al. 2015) and the software R (version 4.4.0; R Core Team 2024). We entered the two within-subject factors $\pm$ *tense* and $\pm$ *parasitic gap* (both deviation coded) and, in the French and Spanish models, the three-level between-subjects factor *language variety* (with Metropolitan French and European Spanish set as the reference categories) into the models as fixed effects, together with their interactions.

The most parsimonious random effects structure of the models was determined through step-wise addition of by-item and by-participant intercepts and slopes. These were retained only if they improved the model fit (assessed with likelihood ratio tests). Further, we added the participant’s age (centered around the mean) as a fixed factor to all models, but this addition did not improve the model fit, or was not supported by the data, in any of them. The final model for the French data contained by-item and by-participant random intercepts, by-item random slopes for $\pm$ *tense*, $\pm$ *parasitic gap*, and the interaction term between the two, and a by-participant random slope for $\pm$ *parasitic gap*. The final model for the Spanish data included by-item and by-participant random intercepts, by-item random slopes for $\pm$ *parasitic gap* and *language variety*, and a by-participant random slope for $\pm$ *parasitic gap*. The final model for the English data

contained the fixed factors $\pm$ *tense*, $\pm$ *parasitic gap*, and their interaction, by-item and by-participant random intercepts, and a by-participant random slope for the effect of $\pm$ *parasitic gap*.

When the interaction between $\pm$ *tense* and $\pm$ *parasitic gap* yielded a significant effect, we conducted post-hoc pairwise comparisons with the *emmeans* package (Lenth 2024), using Bonferroni-corrected *p*-values.

4. Results

4.1. Filler items

Let us first discuss the participants' responses to the filler items in order to decide if they can be considered as benchmarks to evaluate the naturalness of the experimental items. The mean ratings and standard errors of the mean are given in Table 1 for French, Table 2 for Spanish, and Table 3 for English.

Table 2 does not show large differences between the three varieties of French with regard to the fillers. While there are small differences between the ratings for the ungrammatical fillers (French participants are the most, and Canadian participants the least critical), the pattern in the standard errors of the mean is reversed (Canadian participants show the most variation in their responses). As the average ratings are at the very low end of the scale for Canadian participants as well, we will not investigate this pattern further. The average rating for grammatical filler items was lower among the Spanish-speaking than the French-speaking participants, see Table 2. This may be a consequence of the revised stimuli to accommodate the Indigenous participant group. Table 2 also shows that there is a lot of variation in the Cahuapanas data set, which is most likely due to the smaller sample size. Table 3 shows that the American English participants provided ratings that are similar to those from the French-speaking group.

We infer from this that we can safely use the average ratings for the filler items for reference when discussing the patterns in the experimental items.

Table 1. Mean ratings and standard errors of the mean (between brackets) for the filler items in the French experiment.

	Metropolitan French	Belgian French	Canadian French
<i>Grammatical filler</i>	87.1 (0.59)	84.4 (0.62)	84.3 (0.72)
<i>Ungrammatical filler</i>	7.5 (0.68)	11.2 (0.85)	21.5 (1.26)

Table 2. Mean ratings and standard errors of the mean (between brackets) for the filler items in the Spanish experiment.

	European Spanish	Peruvian-Lima Spanish	Cahuapanas Spanish
<i>Grammatical filler</i>	71.6 (1.07)	72.7 (1.13)	71.4 (2.11)
<i>Ungrammatical filler</i>	16.8 (1.22)	14.5 (1.18)	18.8 (2.36)

Table 3. Mean ratings and standard deviations (between brackets) for the filler items in the English experiment.

	American English
<i>Grammatical filler</i>	84.9 (0.78)
<i>Ungrammatical filler</i>	7.8 (1.01)

4.2. Experimental items: descriptive statistics

Let us now turn to the experimental items. The average ratings and standard errors of the mean are given in Table 4 for French, Table 5 for Spanish, and Table 6 for English. The results are visually presented in Figure 1, 2, and 3. The reliability of the datasets at the participant level is excellent ($\rho^2 = 0.86$ for Spanish and French and $\rho^2 = 0.90$ for English), which implies that most of the variation is systematic and can be uniquely attributed to the participant and item facets (Schoenmakers & van Hout 2024a, Schoenmakers 2025). These facets are part of the random structure in our statistical models, thereby allowing participants and items to have varying intercepts (and various varying slopes, Section 3.4). Overall, average ratings for the least marked condition (–tense, –parasitic gap) are numerically 10–20 points lower than those for the grammatical fillers. This may well be due to the syntactic complexity of these sentences. Note also that the average ratings for the most marked condition (+tense, +parasitic gap) are 15–25 points higher than the ratings for the ungrammatical fillers. This suggests that the awkwardness of this condition might not be due to these sentences being ungrammatical per se. We return to this implication in Section 5.1.

Figures 1 and 2 show that French and Spanish seem to pattern according to the tense contrast, in that the condition with a tensed adjunct clause containing a parasitic gap received the lowest ratings (Cahuapanas Spanish is a notable exception, which we discuss in Section 5.2). However, the figures also demonstrate that i) tensed conditions received lower ratings than untensed conditions, and ii) the presence of a parasitic gap lowered ratings. It is not clear whether the combination of these individual effects also led to super-additive effects, at least in the Romance languages. Figure 3 suggests that this is different for American English; tense appears to reduce ratings only in sentences with a parasitic gap. We discuss the inferential statistics in Section 4.3.

Regarding the putative differences between language varieties in the French and Spanish data sets, we already noted that Cahuapanas Spanish shows a very distinct pattern. Yet, Peruvian-Lima Spanish seems to follow a pattern distinct from European Spanish as well: the ratings are higher in each condition (with numerical differences of 4.6–14.5 points). Moreover, the differences between conditions are less extreme. A similar but less pronounced pattern is that between Canadian and Metropolitan French: the former seems to be more permissive than the latter (with numerical differences of 8.4–13.2 points), although the average ratings for the highest rated condition (–tense, –parasitic gap) are very similar, with a numerical difference of 0.2 points. The Belgian French ratings appear similar to the Metropolitan French ratings: the highest numerical difference was 2.6 points, except for the [+tense, –parasitic gap] condition (a numerical difference of 6.9 points, with the Belgian French group less critical).

Table 4. Mean ratings and standard errors of the mean (between brackets) for the experimental items in the French experiment.

Condition	Ex.	Metropolitan French	Belgian French	Canadian French
[– tense, – parasitic gap]	(15a)	61.0 (1.92)	60.6 (1.86)	61.2 (2.12)
[– tense, + parasitic gap]	(15b)	37.1 (1.99)	37.0 (1.89)	45.5 (2.15)
[+ tense, – parasitic gap]	(15c)	43.1 (1.92)	50.0 (1.91)	54.8 (2.07)
[+ tense, + parasitic gap]	(15d)	22.7 (1.39)	25.3 (1.53)	35.9 (1.93)

Table 5. Mean ratings and standard errors of the mean (between brackets) for the experimental items in the Spanish experiment.

Condition	Ex.	European Spanish	Peruvian-Lima Spanish	Cahuapanas Spanish
[– tense, – parasitic gap]	(16a)	59.0 (2.11)	64.0 (2.20)	64.9 (4.81)
[– tense, + parasitic gap]	(16b)	52.4 (2.21)	57.0 (2.48)	69.7 (4.85)
[+ tense, – parasitic gap]	(16c)	50.7 (2.23)	59.2 (2.42)	56.0 (5.10)
[+ tense, + parasitic gap]	(16d)	38.0 (2.04)	52.5 (2.34)	73.9 (4.39)

Table 6. Mean ratings and standard errors of the mean (between brackets) for the experimental items in the English experiment.

Condition	Ex.	American English
[– tense, – parasitic gap]	(17a)	65.1 (2.24)
[– tense, + parasitic gap]	(17b)	47.8 (2.47)
[+ tense, – parasitic gap]	(17c)	63.7 (2.35)
[+ tense, + parasitic gap]	(17d)	33.5 (2.48)

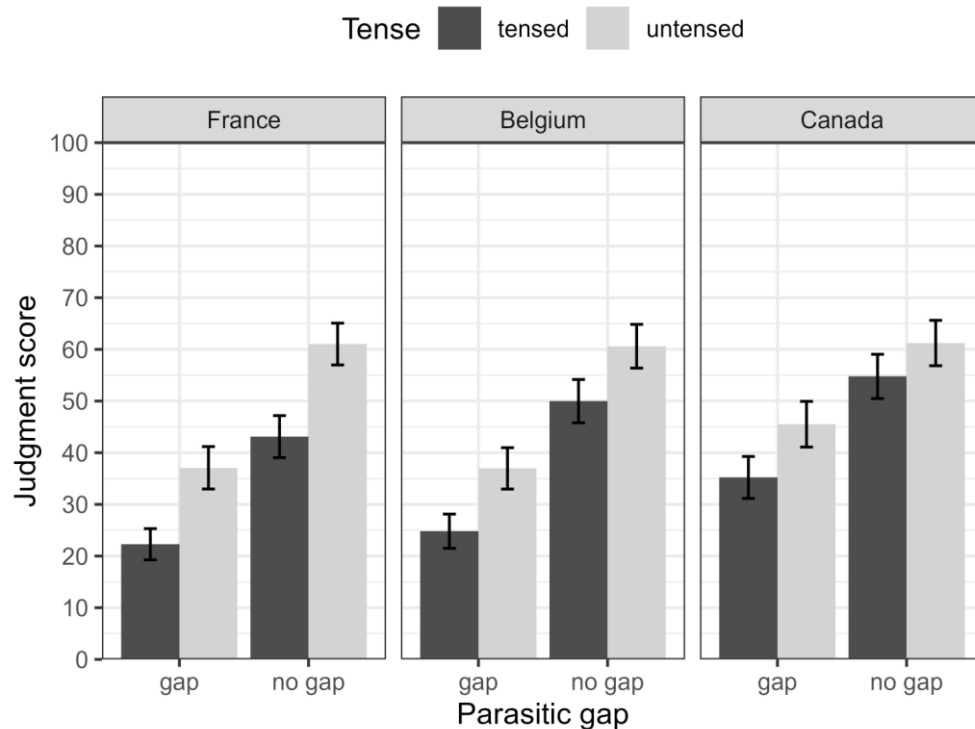
Figure 1. Mean naturalness ratings from speakers of French, grouped by $\pm$ tense and $\pm$ gap (error bars indicate 95% confidence intervals around the mean).

Figure 2. Mean naturalness ratings from speakers of Spanish, grouped by $\pm$ *tense* and $\pm$ *gap* (error bars indicate 95% confidence intervals around the mean).

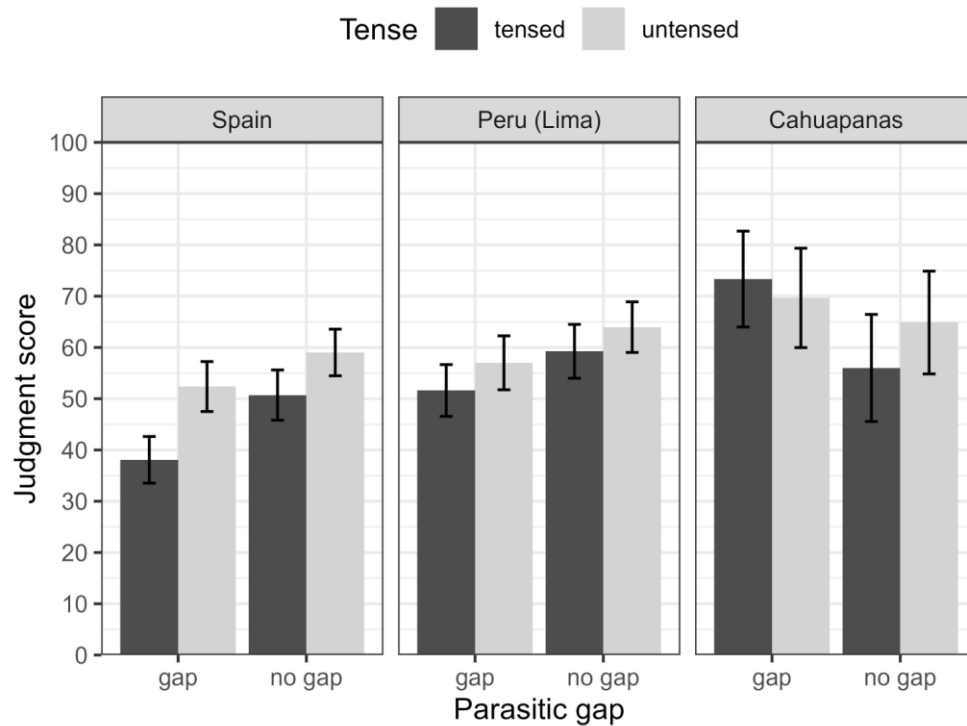
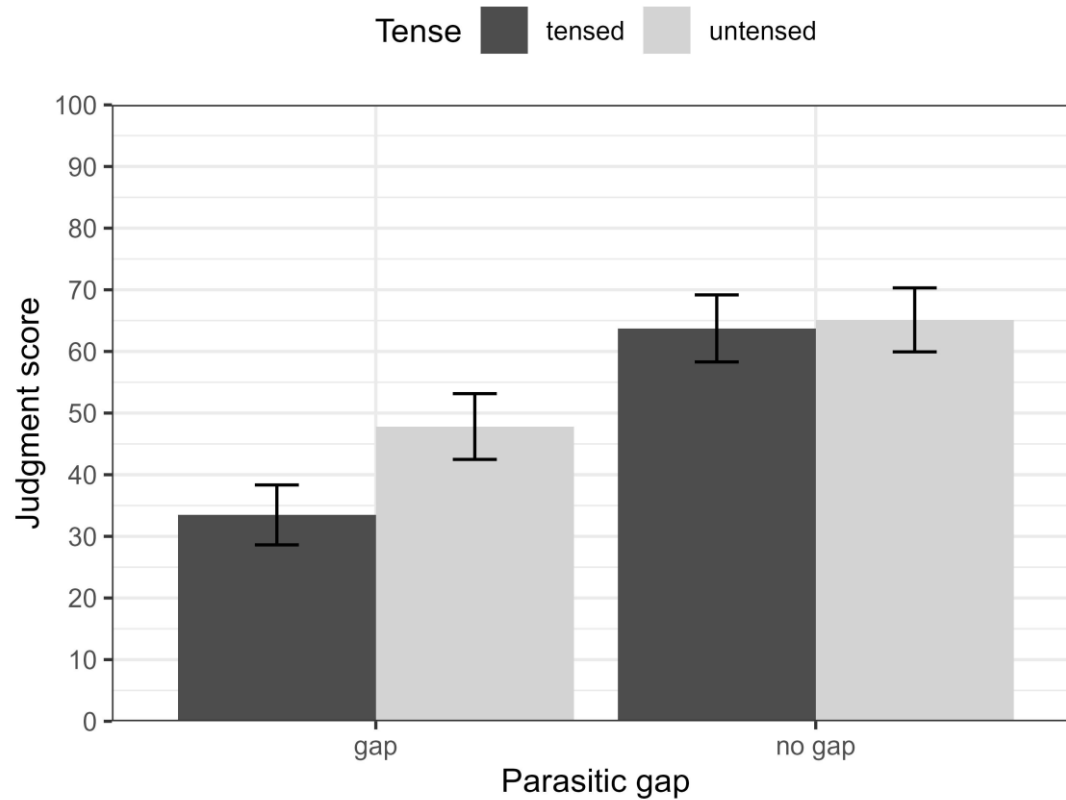


Figure 3. Mean naturalness ratings from speakers of American English, grouped by $\pm$ *tense* and $\pm$ *gap* (error bars indicate 95% confidence intervals around the mean).



4.3. Experimental items: inferential statistics

Here, we focus on the relevant main effects and interaction terms, instead of reporting those for which we do not have specific hypotheses. The full model specifics can be found in Tables 7 (French), 8 (Spanish), and 9 (English).

In the French data set, we find significant main effects of $\pm$ *tense* ($\beta = 0.38$, $t = 7.58$, $p < .001$) and $\pm$ *parasitic gap* ($\beta = 0.53$, $t = 6.72$, $p < .001$) without a significant interaction effect ($\beta = 0.07$, $t = 0.79$, $p = .432$). Tense and parasitic gaps in the adjunct independently impede naturalness, without a super-additive effect. As for the varieties of French, only the interaction effect between *language variety* [Canada] and $\pm$ *tense* was statistically significant ($\beta = -0.16$, $t = -2.67$, $p = .008$), indicating that the Canadian French speakers were less sensitive to tense than Metropolitan French speakers.

Table 7. Model specifics for the French data set.

	β	<i>CI</i>	<i>t</i>	<i>p</i>
(Intercept)	-0.27	-0.39 – -0.14	-4.21	< .001
<i>tense</i>	0.38	0.29 – 0.48	7.58	< .001
<i>parasitic gap</i>	0.53	0.37 – 0.68	6.72	< .001
<i>tense</i> * <i>parasitic gap</i>	0.07	-0.11 – 0.25	0.79	.432
<i>language variety</i> [Belgium]	0.03	-0.06 – 0.12	0.63	.528
<i>tense</i> * <i>language variety</i> [Belgium]	-0.10	-0.21 – 0.01	-1.71	.088
<i>parasitic gap</i> * <i>language variety</i> [Belgium]	0.10	-0.01 – 0.21	1.73	.084
(<i>tense</i> * <i>parasitic gap</i>) * <i>language variety</i> [Belgium]	-0.08	-0.31 – 0.14	-0.71	.477
<i>language variety</i> [Canada]	0.06	-0.03 – 0.16	1.35	.176
<i>tense</i> * <i>language variety</i> [Canada]	-0.16	-0.27 – -0.04	-2.67	.008
<i>parasitic gap</i> * <i>language variety</i> [Canada]	-0.10	-0.21 – 0.02	-1.69	.091
(<i>tense</i> * <i>parasitic gap</i>) * <i>language variety</i> [Canada]	-0.19	-0.42 – 0.04	-1.64	.102

In Spanish, we again find significant main effects of $\pm$ *tense* ($\beta = 0.32$, $t = 6.34$, $p < .001$) and $\pm$ *parasitic gap* ($\beta = 0.27$, $t = 3.09$, $p = .002$); the interaction effect was not significant ($\beta = -0.09$, $t = -0.93$, $p = .351$). The presence of tense and a parasitic gap in the clausal adjunct independently impede naturalness, without a super-additive effect. The interaction effects of *language variety* [Cahuapanas] and $\pm$ *tense* ($\beta = -0.26$, $t = -2.84$, $p = .005$) or $\pm$ *parasitic gap* ($\beta = -0.51$, $t = -4.31$, $p < .001$) were significant, which indicates that these effects were different for speakers of European Spanish and Cahuapanas Spanish: the difference between the tensed and untensed conditions was smaller for Cahuapanas Spanish speakers (the former receiving lower ratings than the latter in European Spanish), while the presence of a parasitic gap yielded lower ratings among speakers of European Spanish, but higher ratings among Cahuapanas Spanish speakers. The three-way interaction was also significant ($\beta = 0.39$, $t = 2.14$, $p = .032$).

The interaction effects between *language variety* [Lima] and $\pm$ *tense* ($\beta = -0.20$, $t = -2.83$, $p = .005$) was significant, but none of the other interactions with *language variety* [Lima] were. The effect of tense was larger in the European variety than in the Peruvian-Lima variety.

Table 8. Model specifics for the Spanish data set.

	β	<i>CI</i>	<i>t</i>	<i>p</i>
(Intercept)	-0.02	-0.16 – 0.11	-0.35	.727
<i>tense</i>	0.32	0.22 – 0.42	6.34	< .001
<i>parasitic gap</i>	0.27	0.10 – 0.44	3.09	.002
<i>tense</i> * <i>parasitic gap</i>	-0.09	-0.29 – 0.10	-0.93	.351
<i>language variety</i> [Cahuapanas]	0.22	-0.01 – 0.46	1.86	.063
<i>tense</i> * <i>language variety</i> [Cahuapanas]	-0.26	-0.44 – -0.08	-2.84	.005
<i>parasitic gap</i> * <i>language variety</i> [Cahuapanas]	-0.51	-0.74 – -0.28	-4.31	< .001
(<i>tense</i> * <i>parasitic gap</i>) * <i>language variety</i> [Cahuapanas]	0.39	0.03 – 0.75	2.14	.032
<i>language variety</i> [Lima]	0.14	0.00 – 0.28	2.01	.045
<i>tense</i> * <i>language variety</i> [Lima]	-0.20	-0.34 – -0.06	-2.83	.005
<i>parasitic gap</i> * <i>language variety</i> [Lima]	-0.10	-0.28 – 0.07	-1.13	.257
(<i>tense</i> * <i>parasitic gap</i>) * <i>language variety</i> [Lima]	0.09	-0.19 – 0.36	0.60	.546

In the English data, we find significant main effects of $\pm$ *tense* ($\beta = 0.20$, $t = 3.83$, $p < .001$), $\pm$ *parasitic gap* ($\beta = 0.58$, $t = 7.86$, $p < .001$), as well as the interaction effect ($\beta = -0.37$, $t = -3.60$, $p < .001$). Post-hoc analyses indicate that the tense effect does emerge in sentences with a parasitic gap ($t = -5.26$, $p < .001$), but not in sentences without a parasitic gap ($t = -0.16$, $p = 1$).

Table 9. Model specifics for the English data set.

	β	<i>CI</i>	<i>t</i>	<i>p</i>
(Intercept)	-0.07	-0.19 – 0.05	-1.12	.264
<i>tense</i>	0.20	0.10 – 0.30	3.83	< .001
<i>parasitic gap</i>	0.58	0.44 – 0.73	7.86	< .001
<i>tense</i> * <i>parasitic gap</i>	-0.37	-0.58 – -0.17	-3.60	< .001

4.4. Exploratory analysis of different adjunct clauses in French and Spanish

In this subsection, we explore putative differences between the adjunct types tested in the Spanish and French experiments. We stress that the analyses are only exploratory, since the three categories (*before*, *after*, *without*) do not contain equal numbers of items nor were the items minimal pairs to each other (see Section 3.2). We thus leave more detailed investigation of putative differences for future research.

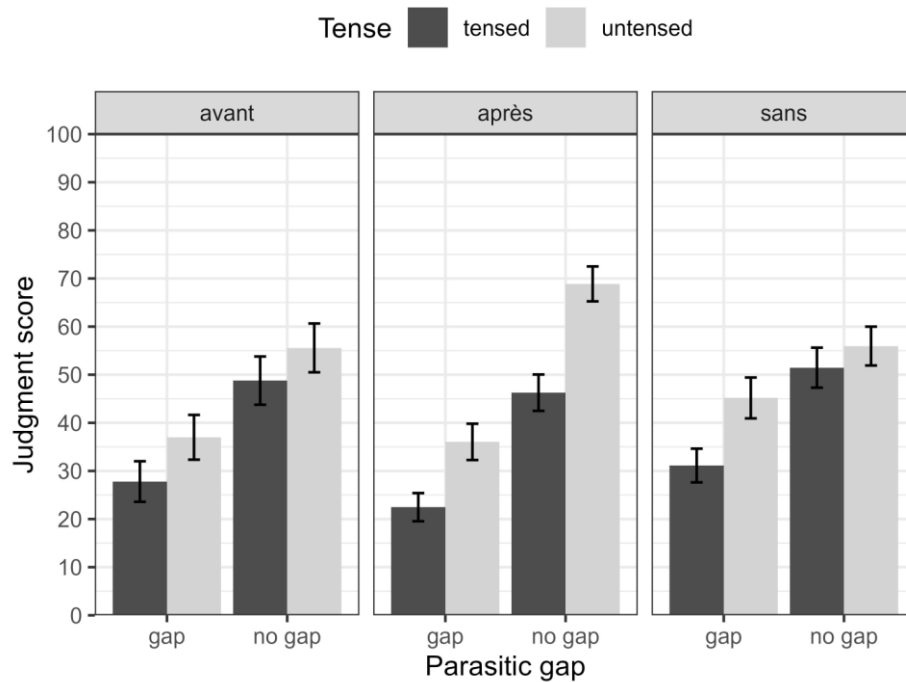
First, we simplified the data set by aggregating over the language varieties. As inclusion of the fixed factor *language variety* did not improve the model fit for French, we analyzed the data from the different varieties of French together (for the purposes of analysis). This was not the case for the Spanish data. After removal of the data from the Cahuapanas speakers, however, inclusion of *language variety* no longer improved the model fit. The new data set consisted of European and Peruvian-Lima Spanish data only. The French random structure was simplified by removing the random slope for the interaction term between $\pm$ *tense* and $\pm$ *parasitic gap*, as the model was otherwise not supported by the data. The variable *adjunct type* (*before*, *after*, *without*) was coded using Helmert contrasts ($-\frac{1}{3}$, $-\frac{1}{3}$, $\frac{2}{3}$ and $\frac{1}{2}$, $-\frac{1}{2}$, 0). In this way, we could compare the temporal to the circumstantial adjuncts in a first contrast, and the two types of temporal adjuncts with each other in a second contrast. The results per adjunct type are visually presented in Figures 4 and 5.

In the French data, we find significant three-way interactions between $\pm$ *tense*, $\pm$ *parasitic gap*, and *adjunct type* (contrast 1: $\beta = -0.35$, $t = -3.35$, $p = .001$; contrast 2:

$\beta = -0.35$, $t = -2.71$, $p = .007$). The tense contrast thus behaves differently in different types of adjunct clauses. The picture seems to be rather complex, as both the difference between temporal and circumstantial adjuncts, and between *before* and *after* adjuncts, was significant.¹¹

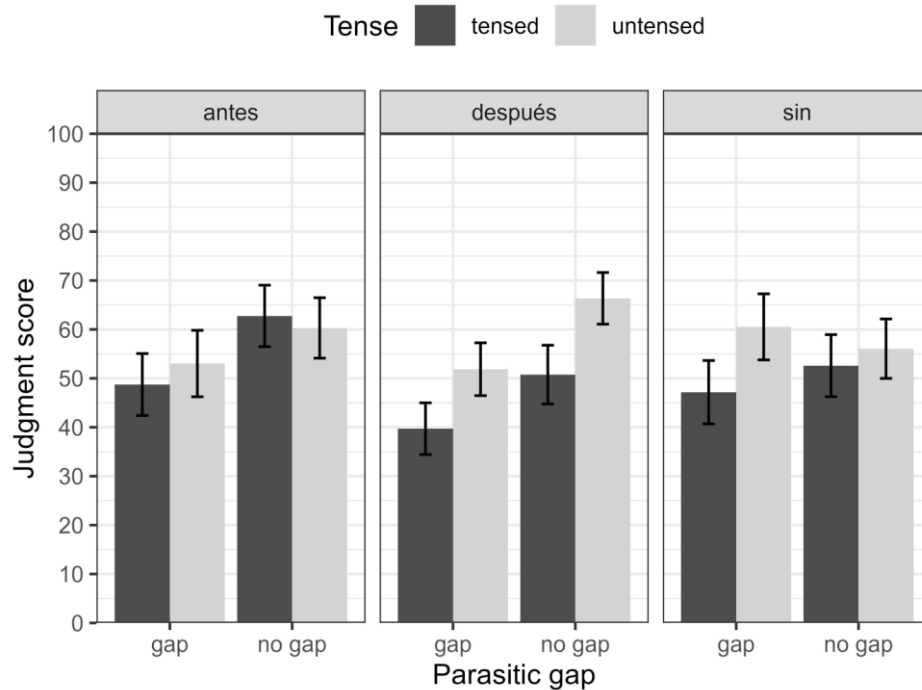
Spanish responses to the different adjunct types were overall not significantly different from each other (contrast 1: $\beta = 0.01$, $t = 0.05$, $p = .962$; contrast 2: $\beta = 0.10$, $t = 0.75$, $p = .453$). The interaction effects between $\pm$ *parasitic gap* and *adjunct type* were not significant (contrast 1: $\beta = -0.30$, $t = -1.74$, $p = .082$; contrast 2: $\beta = -0.05$, $t = -0.27$, $p = .787$), nor was the interaction effect between $\pm$ *tense* and the first contrast (temporal vs. circumstantial adjuncts; $\beta = 0.05$, $t = 0.61$, $p = .544$). However, the interaction effect between $\pm$ *tense* and the second contrast (*before* vs. *after* adjuncts) was significant ($\beta = -0.28$, $t = 3.25$, $p = .001$). This indicates that the effect of tense was larger in *after* than *before* clauses, in Spanish (irrespective of the presence of a parasitic gap in the adjunct).

Figure 4. Mean naturalness ratings from speakers of French, per adjunct type, grouped by $\pm$ *tense* and $\pm$ *gap* (error bars indicate 95% confidence intervals around the mean).



¹¹ The main effects of *adjunct type* were not significant (contrast 1: $\beta = 0.08$, $t = 0.66$, $p = .507$; contrast 2: $\beta = -0.02$, $t = -0.15$, $p = .884$), nor was the interaction between $\pm$ *tense* and the first contrast of *adjunct type* (temporal vs. circumstantial adjuncts; $\beta = -0.09$, $t = -1.13$, $p = .259$). The interaction effect between $\pm$ *tense* and the second contrast of *adjunct type* (*before* vs. *after* adjuncts) was significant ($\beta = -0.24$, $t = -2.61$, $p = .009$), and so were the interaction effects between $\pm$ *parasitic gap* and *adjunct type* (contrast 1: $\beta = -0.21$, $t = -4.10$, $p < .001$; contrast 2: $\beta = -0.19$, $t = -3.10$, $p = .002$).

Figure 5. Mean naturalness ratings from speakers of European and Peruvian-Lima Spanish, per adjunct type, grouped by $\pm$ tense and $\pm$ gap (error bars indicate 95% confidence intervals around the mean).



In all, the adjunct type appears to influence acceptability of parasitic gaps, but we could not identify clearly distinct patterns between *after*, *before*, or *without*, based on our data. Thus, we report our data and leave dedicated investigation for future work.

5. Discussion

5.1. The ‘tense effect’

Our two hypotheses were that the tense contrast is reflected in acceptability judgments from French- and Spanish-speaking participants (H1), but not from American-English participants (H2). Our data arguably confirm H1, although it depends on your working definition of the ‘tense contrast’. Sentences with a parasitic gap inside a tensed adjunct received worse ratings than sentences with a parasitic gap inside an untensed adjunct. However, tensed clauses received worse ratings than untensed clauses in the sentences without a parasitic gap as well, and adjuncts with a parasitic gap received worse ratings than adjuncts without them. There is no super-additive effect. One could argue that the ‘tense effect’ in parasitic gap constructions at least in Romance languages results from a combination of independent tense and parasitic-gap effects pushing the acceptability below some hypothetical threshold, without the combination yielding super-additive effects. All else being equal, this interpretation is not compatible with García Mayo & Kempchinsky’s (1994) analysis: for them, it is the combination of a parasitic gap and a tensed adjunct that leads to ungrammaticality and hence unacceptability. Recall that this combination violates Subjacency (Chomsky 1973, 1977): the dependency between

the *wh*-filler and the operator linked to the parasitic gap is formed across two blocking categories. The sentence is consequently ungrammatical, while all other conditions are grammatical and should hence receive acceptable ratings. This analysis crucially does not predict independent effects of tense and the presence of a parasitic gap. Note also that sentences with a parasitic gap inside a tensed adjunct did not score as bad as the ungrammatical fillers. This implies that the unacceptability of these items is not in fact due to the violation of a grammatical constraint like Subjacency: all else being equal, grammatical violations should categorically lead to unacceptable ratings. However, it is not evident that non-syntactic accounts fare any better in accounting for these data. Recall that Coopmans et al. (2025) recently investigated the acceptability of parasitic gaps in Dutch. They find that sentences are acceptable when the parasitic gap is located inside an untensed adjunct clause, but unacceptable when it is located inside a tensed adjunct clause. However, sentences with a parasitic gap inside a tensed adjunct are still rated much more favorably than the ungrammatical filler items. Based on these results, Coopmans et al. discuss various alternative, non-syntactic accounts, but they conclude that they all fall short in explaining the data pattern. Coopmans et al. finally conclude that syntactic theory best explains their results, even though gradience in the ratings is an unresolved issue (the authors suggest that semantic conditions, like Truswell's 2011 *Single Event Grouping Condition*, may also play a role). Therefore, we are hesitant to dismiss syntactic explanations of our data. As noted, however, the pattern we find does not corroborate García Mayo & Kempchinsky's (1994) analysis.

Further, our results do not replicate the findings in Dal Farra (2019) for Italian. Dal Farra found significant super-additive effects for tense in parasitic gaps, although she was mainly interested in adjunct island violations and so the structure contrast was not the same as in our experiment (i.e. parasitic gap vs. island structures). The different operationalization may have affected the ratings. Another possibility is that dal Farra's experiment, with eighty participants, may have been in a better position to statistically detect an interaction effect if there is one. We note, however, that dal Farra tested only twelve sentences (three items per condition) whereas we tested twenty (five items per condition). Alternatively, Italian might simply behave unlike French and Spanish.

Turning now to the second hypothesis, our results show that we must refute it. English sentences with a parasitic gap located inside a tensed adjunct clause received the lowest ratings, and the combination led to super-additivity: only the sentences with a parasitic gap were negatively affected by the presence of tense. This result replicates findings from the earlier experiments (Kurzmann & Crawford 1991, Phillips 2006, and Boxell & Felser 2017 for English; Coopmans et al. 2025 for Dutch).

5.2. Varieties of French and Spanish

H3 predicted that the tense contrast would be weaker for Belgian and Canadian French speakers than for Metropolitan French speakers. This hypothesis was not confirmed: there were no clear differences in the responses from the different varieties of French. H4 predicted that the American varieties of Spanish would yield weaker tense contrasts than the European variety. Our findings confirm this hypothesis: both Peruvian-Lima and Cahuapanas Spanish showed lower sensitivity to the tense contrast; Cahuapanas Spanish in fact appears to overturn the effect.

Before discussing possible effects of linguistic transfer in the Spanish data, we note that the French varieties under investigation were possibly more similar than the

Spanish varieties. Dunn (2019: Figure 6) uses computational construction grammar to show that the syntactic profiles of Metropolitan and Belgian French are highly similar, whereas European and Peruvian Spanish are much less similar (Canadian French and Cahuapanas Spanish were not included in Dunn's sample). This difference may be due to the fact that France and Belgium are both in Europe, whereas Spain and Peru are in different continents. Note that Canadian French appears to diverge from Metropolitan French more than Belgian French does (Figure 2).

More likely in our data, however, is the language contact between local Spanish varieties and Quechuan languages (Peruvian-Lima) or Shawi (Cahuapanas). Adjunct clauses in these languages obligatorily carry person-agreement markers. Speakers may have coerced the Spanish tense markers to person-agreement markers, which are more familiar to them, and thereby essentially eliminated the conceptual distinction between tensed and untensed adjuncts. In so doing, they arguably reduce the tense contrast to a formal distinction and weaken their sensitivity to it. The tense contrast is more reduced in Cahuapanas Spanish than in Peruvian-Lima Spanish. This could be due to the fact that contact with Quechua varieties in Lima happened earlier, such that these varieties exert but a substrate effect on the contemporary variety of Spanish, which progresses toward a more general-like variety. Yet, dedicated variationist analysis of this variable would be necessary to understand its precise distribution in the city and its potential relation to Quechua-Spanish contact. We leave this for future research.

6. Conclusion

This paper reported on an acceptability judgment experiment in which we investigated the 'tense effect' in parasitic gap configurations, i.e. we tested whether parasitic gaps located in tensed adjuncts are worse than those in untensed adjuncts. According to the analysis in García Mayo & Kempchinsky (1994), the tense effect emerges in Romance languages, but not in English. In our judgment experiment, we tested seven groups of participants: speakers of Metropolitan French, Belgian French, and Canadian French, speakers of European Spanish, Peruvian-Lima Spanish, and Cahuapanas Spanish, and speakers of American English. We moreover hypothesized that language contact and language transfer may impact the tense effect between language varieties, because of interference from a Germanic language (for French) or from Quechuan languages and Shawi (for Spanish).

In our data from French and Spanish, we find that the presence of tense and a parasitic gap independently reduce acceptability, but we did not find a super-additive effect. This is not in line with García Mayo & Kempchinsky's (1994) analysis. We did find super-additivity in the American English data set, where tense only affected the ratings in sentences with a parasitic gap. Since our experimental design did not permit comparison with the Romance languages, we must leave this for future research, but we note that our results corroborate earlier experimental work on Germanic languages.

We did not find differences between varieties of French (which is arguably not surprising if the tense effect also exists in English and Dutch), but we did find different sensitivities to the tense effects in the varieties of Spanish. We argued that speakers of Peruvian-Lima and Cahuapanas Spanish might map the Quechuan/Shawi structure of adjunct clauses onto Spanish morphology and conceptually turn the tense markers into

person-marking affixes. They thereby eliminate the interpretative difference between tensed and untensed adjunct clauses and reduce their sensitivity to the tense effect.

Finally, we ran exploratory analyses to see if there were differences between *after*-, *before*-, and *without*-clauses in the data from French and Spanish. This resulted in complex patterns for future research to scrutinize. We hope that our data can serve as an empirical basis for such endeavors. We conclude by stressing that experimental explorations of syntactic phenomena in different language varieties can be fruitful to linguistic research, as we hope to have shown with the present study.

Abbreviations

1 ‘first person’; 2 ‘second person’; ABL ‘ablative’; ACC ‘accusative’; CNTRST ‘contrastive’; DUR ‘durative’; EDUC ‘eductive’; EV ‘evidential’; IRREAL ‘irrealis’; LOC ‘locative’; NEG ‘negative’; NMLZ ‘nominalization’; PERF ‘perfective’; PROG ‘progressive’; PL ‘plural’; REAL ‘realis’; SEQ ‘sequential’; SG ‘singular’; VM ‘valency modifier’.

Data availability

All data and stimuli can be found in our OSF repository (<https://osf.io/jw8tq/>).

References

- Adger, David & Graeme Trousdale. 2007. Variation in English syntax: Theoretical implications. *English Language and Linguistics* 11(2): 261-278. doi: 10.1017/S1360674307002250
- Bates, Douglas, Martin Mächler, Ben Bolker & Steve Walker. 2015. Fitting linear mixed-effects models using *lme4*. *Journal of Statistical Software* 67(1): 1-48. doi: 10.18637/jss.v067.i01
- Bhatt, Rajesh & Roumyana Pancheva. 2006. Conditionals. In M. Everaert & H. van Riemsdijk (eds.), *The Blackwell companion to syntax*, vol. 1, 638-687. Malden/Oxford: Blackwell. doi: 10.1002/9780470996591.ch16
- Bordelois, Ivonne. 1986. Parasitic gaps: Extensions of restructuring. In I. Bordelois & H. Contreras (eds.), *Generative studies in Spanish syntax*, 1-24. De Gruyter Mouton. doi: 10.1515/9783110859232-003
- Boxell, Oliver & Claudia Felser. 2017. Sensitivity to parasitic gaps inside subject islands in native and non-native sentence processing. *Bilingualism: Language and Cognition* 20(3): 494-511. doi: 10.1017/S1366728915000942
- Brissaud, Catherine. 2013. L'accord du participe passé avec le COD antérieur : un arbre qui cache la forêt. In Nathalie Gettliffe & Jean-Paul Meyer (eds.), *Dans la carrière des mots : Mélanges offerts à Jean-Christophe Pellat*, 161-170. <https://hal.science/hal-03229400v1>

- Brysbaert, Marc. 2019. How many participants do we have to include in properly powered experiments? A tutorial of power analysis with reference tables. *Journal of Cognition* 2(1): 1-38. doi: 10.5334/joc.72
- Caravedo, Rocío. 1989. *El español de Lima: Materiales para el estudio del habla culta*. Fondo Editorial Pontificia Universidad Católica del Perú. doi: 10.18800/PC4904LC26E
- van Casteren, Maarten & Matthew Davis. 2006. *Mix*, a program for pseudorandomization. *Behavior Research Methods* 38(4): 584-589. doi: 10.3758/BF03193889.
- Cerrón-Palomino, Rodolfo. 1976. *Gramática quechua Junín-Huanca*. Ministerio de Educación.
- Cerrón-Palomino, Rodolfo. 2008. *Quechumara: Estructuras paralelas del quechua y el aimara*. Plural Editores.
- Chapman, Cassandra, Victor Kuperman & Ivona Kučerová. 2014. Online processing of parasitic gaps: Evidence from eye-tracking. Poster presentation at *CUNY conference on human sentence processing* 27. doi: 10.13140/RG.2.1.4562.6644
- Chomsky, Noam. 1973. Conditions on transformations. In S. Anderson & P. Kiparsky (eds.), *Festschrift for Morris Halle*, 232-286. Holt, Rinehart and Winston.
- Chomsky, Noam. 1977. On wh-movement. In Peter Culicover, Thomas Wasow & Adrian Akmajian (eds.), *Formal syntax*, 71-132. Academic Press.
- Chomsky, Noam. 1986. *Barriers*. Cambridge Massachusetts: MIT Press.
- Chomsky, Noam. 2001. Derivation by phase. In M. Kenstowicz (ed.), *Ken Hale: A life in language*, 1-52. Cambridge Massachusetts: MIT Press.
- Chomsky, Noam. 2008. On phases. In R. Freidin, C. Otero & M.L. Zubizarreta (eds.), *Foundational issues in linguistic theory: Essays in honor of Jean-Roger Vergnaud*, 133-166. Cambridge Massachusetts: MIT Press.
- Cinque, Guglielmo. 1990. *Types of $\bar{A}$ -dependencies*. Cambridge Massachusetts: MIT Press.
- Coopmans, Cas, Kars Ligtenberg, Michelle Suijkerbuijk & Gert-Jan Schoenmakers. 2025. Comparing syntactic and discourse accounts of adjunct island effects: Experimental evidence from acceptability judgments. *The Linguistic Review* 42(2): 139-187. doi: 10.1515/tlr-2025-2005

- Cornips, Leonie. 2015. The no man's land between syntax and variationist sociolinguistics: The case of idiolectal variability. In Aria Adli, Marco García García & Göz Kaufmann (eds.), *Variation in language: System- and usage-based approaches*, 147-172. De Gruyter. doi: 10.1515/9783110346855-007
- Cornips, Leonie & Karen Corrigan. 2005a. *Syntax and variation: Reconciling the biological with the social*. Amsterdam/Philadelphia: John Benjamins. doi: 10.1075/cilt.265
- Cornips, Leonie & Karen Corrigan. 2005b. Convergence and divergence in grammar. In P. Auer, F. Hinskens & P. Kerswill (eds.), *Dialect change: Convergence and divergence in European languages*, 96-134. Cambridge: Cambridge University Press. doi: 10.1017/cbo9780511486623.006
- Cowart, Wayne. 1997. *Experimental syntax: Applying objective methods to sentence judgments*. Thousand Oaks: Sage Publications.
- Culicover, Peter & Paul Postal. 2001. *Parasitic gaps*. Cambridge Massachusetts: MIT Press.
- Dunn, Jonathan. 2019. Global syntactic variation in seven languages: Toward a computational dialectology. *Frontiers in Artificial Intelligence* 2, Article 15. doi: 10.3389/frai.2019.00015
- Engdahl, Elisabet. 1983. Parasitic gaps. *Linguistics and Philosophy* 6(1): 5-34. doi: 10.1007/bf00868088
- Escobar, Anna María. 1994. Evidential uses in the Spanish of Quechua speakers in Peru. *Southwest Journal of Linguistics* 13(1&2): 21-43.
- Escobar, Anna María. 2001. Contact features in colonial Peruvian Spanish. *International Journal of the Sociology of Language* 149: 79-93. doi: 10.1515/ijsl.2001.024
- dal Farra, Chiara. 2019. Variability in adjunct islands: An experimental study in Italian. In Richard Stockwell, Maura O'Leary, Zhongshi Xu & Z.L. Zhou (eds.), *Proceedings of the 36th West Coast Conference on Formal Linguistics*, 115-120. Cascadilla Press.
- Faure, Richard & Katerina Palasis. 2021. Exclusivity! Wh-fronting is not optional *wh*-movement in colloquial French. *Natural Language & Linguistic Theory* 39(1): 57-95. doi: 10.1007/s11049-020-09476-w
- Frampton, John. 1990. Parasitic gaps and the theory of *wh*-chains. *Linguistic Inquiry* 21(1): 49-77.

Francis, Elaine. 2022. *Gradient acceptability and linguistic theory*. Oxford: Oxford University Press. doi: 10.1093/oso/9780192898944.001.0001

García Mayo, Maria del Pilar. 1993. *On Certain Null Operator Constructions in English and Spanish*. Ph.D. thesis, University of Iowa.

García Mayo, Maria del Pilar. 1994. Operators, clause-boundedness and finiteness in English vs. Romance parasitic gap constructions. *Revista di Filología de la Universidad de La Laguna* 13: 145-152.

García Mayo, Maria del Pilar & Paula Kempchinsky. 1994. Finiteness in Romance vs. English parasitic gap constructions. In M. Mazzola (ed.), *Issues and theory in Romance linguistics: Selected papers from the Linguistic Symposium on Romance Languages XXIII*, 303-316. Georgetown University Press.

Geis, Michael. 1970. *Adverbial subordinate clauses in English*. Ph.D. thesis, Massachusetts Institute of Technology.

Gelman, Andrew & Hal Stern. 2006. The difference between “significant” and “not significant” is not itself statistically significant. *The American Statistician* 60(4): 328-331. doi: 10.1198/000313006X152649

Kayne, Richard. 1983. Connectedness. *Linguistic Inquiry* 14(2): 223-249.

Kurtzman, Howard & Loren Crawford. 1991. Processing parasitic gaps. In Tim Sherer (ed.), *Proceedings of the 21st Annual Meeting of the North Eastern Linguistics Society*, 217–231. GLSA Publications.

Labov, William. 1972. *Sociolinguistic patterns*. Pennsylvania: University of Pennsylvania Press.

Labov, William. 1994. *Principles of linguistic change: Internal factors*. Malden/Oxford: Wiley-Blackwell.

Larson, Richard. 1990. Extraction and multiple selection in PPs. *The Linguistic Review* 7(2): 169-182. doi: 10.1515/tlir.1990.7.2.169

Lenth, Russell. 2024. Emmeans: Estimated marginal means, aka least-squares means. R package version 1.10.2.

Manzini, M. Rita. 1994. Locality, minimalism, and parasitic gaps. *Linguistic Inquiry* 25(3): 481-508.

Mougeon, Raymond, Terry Nadasdi & Katherine Rehner. 2005. Contact-induced linguistic innovations on the continuum of language use: The case of French in Ontario. *Bilingualism: Language and Cognition* 8(2): 99-115. doi: 10.1017/S1366728905002142

- Nissenbaum, Jonathan. 2000. *Investigations of covert phrase movement*. PhD dissertation Massachusetts Institute of Technology.
- Pañeda, Claudia, Sol Lago, Elena Vares, João Veríssimo & Claudia Felser. 2020. Island effects in Spanish comprehension. *Glossa: A Journal of General Linguistics* 5(1): Article 21. doi: 10.5334/gjgl.1058
- Phillips, Colin. 2006. The real-time status of island phenomena. *Language* 82(4): 795-823. doi: 10.1353/lan.2006.0217
- Postal, Paul. 1993. Parasitic gaps and the across-the-board phenomenon. *Linguistic Inquiry* 24(4): 735-754.
- Preston, Alvin. 2021. *Grammaticality judgments: A linguistic perspective*. States Academic Press.
- Quintanilla Anglas, Rómulo. 2002. Presencia Quechua en el español coloquial hablado en Lima: Casos de jato y palta. *Escritura y Pensamiento* 5(11): 100-111.
- R Core Team. 2024. *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. <https://www.R-project.org/>
- Ratcliff, Janet. 1987. The plausibility effect: Lexical priming or sentential processing? *Memory & Cognition* 15(6): 482-496. doi: 10.3758/BF03198382
- Rojas-Berscia, Luis Miguel. 2019. Nominalization in Shawi (Chayahuita). In: R.Zariquiey, M. Shibatani & D. Fleck (eds.), *Nominalization in the languages of the Americas*, 491-514). John Benjamins. doi: 10.1075/tsl.124.13roj
- Rojas-Berscia, Luis Miguel. 2021. *Pre-historical language contact in Peruvian Amazonia: A dynamic approach to Shawi (Kawapanan)*. Amsterdam/Philadelphia: John Benjamins. doi: 10.1075/coll.58
- Rojas-Berscia, Luis Miguel, Tomas Lehecka, Simon Claassen, Bram Peute, Moisés Pinedo Escobedo, Segundo Pinedo Escobedo, Abimael Huiñapi Tangoa & Elio Pizango. 2022. Embedding in Shawi narrations: A quantitative analysis of embedding in a post-colonial Amazonian indigenous society. *Language in Society* 51(3): 427-451. doi: 10.1017/S0047404521000634
- Ross, John. 1967. *Constraints on Variables in Syntax*. Ph.D. thesis, Massachusetts Institute of Technology.
- Sánchez, Liliana. 1996. *Syntactic structure in nominals: A comparative study of Spanish and Southern Quechua*. Los Angeles: University of Southern California dissertation.

- Sánchez, Liliana. 2004. Functional convergence in the tense, evidentiality and aspectual systems of Quechua Spanish bilinguals. *Bilingualism: Language and Cognition* 7(2): 147–162. doi: 10.1017/S136672890400149X
- Schoenmakers, Gert-Jan & Roeland van Hout. 2024a. Consistency and variability in acceptability judgments from naive native speakers. *Nederlandse Taalkunde* 29(1): 49–75. doi: 10.5117/NEDTAA2024.1.005.SCHO
- Schoenmakers, Gert-Jan & Roeland van Hout. 2024b. Two roads diverged in a linguistic wood, and we have to travel both. *Nederlandse Taalkunde* 29(1): 82–88. doi: 10.5117/NEDTAA2024.1.007.SCHO
- Schoenmakers, Gert-Jan. 2025. How a simple increase in the number of items can improve the reliability of linguistic judgment data: The case of island experiments. *Languages* 10(11): Article 277. doi: 10.3390/languages10110277
- Schütze, Carson. 1996. *The empirical base of linguistics: Grammaticality judgments and linguistic methodology*. Chicago: University of Chicago Press. Reprinted in 2016 by Language Science Press. doi: 10.26530/OAPEN_603356
- Schütze, Carson & Jon Sprouse. 2014. Judgment data. In R. Podesva & D. Sharma (eds.), *Research methods in linguistics*, 27–50. Cambridge: Cambridge University Press. doi: 10.1017/CBO9781139013734.004
- Stowell, Timothy. 1985. Null antecedents and the theory of proper government. In S. Berman, J-W. Choe & J. McDonough (eds.), *Proceedings of the North East Linguistics Society 16*, 476–493. GLSA UMass/Amherst.
- Sprouse, Jon. 2007. *A Program for Experimental Syntax: Finding the Relationship between Acceptability and Grammatical Knowledge*. Ph.D. thesis, University of Maryland.
- Tellier, Christine. 1991. *Licensing theory and French parasitic gaps*. Dordrecht: Kluwer. doi: 10.1007/978-94-011-3596-2
- Treffers-Daller, Jeanine. 2012. Grammatical collocations and verb-particle constructions in Brussels French: A corpus-linguistic approach to transfer. *International Journal of Bilingualism* 16(1): 53–82. doi: 10.1177/1367006911403213
- Truswell, Robert. 2011. *Events, phrases, and questions*. Oxford: Oxford University Press. doi: 10.1093/acprof:oso/9780199577774.001.0001
- VanDyne, Katie. 2020. The interaction of parasitic gaps and adjunct control in Spanish. In J. Colomina-Almiñana & S. Sessarego (eds.), *Language patterns in Spanish and*

beyond: Structure, Context and Development, 37-51. Routledge. doi: 10.4324/9781003091790-4