The obligatoriness of arguments
To appear in *Language and Linguistics Compass*

Katie Van Luven and Ida Toivonen
Carleton University

February 15, 2024

Abstract

A common diagnostic for distinguishing between arguments and adjuncts is *obligatoriness/optionality*: as a rule of thumb, arguments are obligatory and adjuncts are optional. However, there are many examples of optional arguments, which have led researchers to question the usefulness of this diagnostic and sometimes even the very distinction between arguments and adjuncts. This paper aims to show that arguments are not simply optional; they are omissible only under identifiable grammatical and pragmatic conditions. By contrast, there are no conditions on when adjuncts can be omitted. There are instead pragmatic conditions that dictate the inclusion of adjuncts.

1 Introduction

A common criterion for classifying a phrase as a linguistic argument is *syntactic obligatoriness*. According to this criterion, arguments are obligatory and adjuncts are not.[1] Consider the sentence in (1):

(1) Sarah missed the bus this morning.

In (1), *Sarah* and *the bus* are obligatory, but *this morning* is not. By the obligatoriness criterion, it follows that *Sarah* and *the bus* are arguments, and *this morning* is an adjunct. This

[1] See, for example, Tallerman (2005), Bierwisch (2003), Dalrymple (2001), Chametzky (2000), Somers (1984), Lyons (1968).

particular example is not problematic, since *Sarah* and *the bus* are classified as arguments by other criteria as well.

The obligatoriness criterion is recognized as a good rule of thumb and it is often cited in linguistics textbooks as a way to distinguish between arguments and adjuncts. However, the same textbooks typically also point out that arguments can sometimes be omitted. For example, Carnie (2007, 52) posits that "[o]nly obligatory elements are considered arguments", but he immediately adds that this claim is "not as straightforward as it sounds". Carnie cites *to run* as an example which has both an intransitive and a transitive use (*run a race*).

These types of caveats alongside complications such as unclear acceptability judgements in regard to other argumenthood diagnostics have led some authors to question the very existence of the argument-adjunct distinction. For example, McInnerney (2022a,b, 2023) challenges the distinction, and so does Przepiórkowski (2016, 575), who refers to it as "just another linguistic hoax". However, we do not reject the distinction between arguments and adjuncts here, and in the literature that we review below it is in fact presupposed.

We maintain that obligatoriness is indeed an important property of arguments: arguments are by default obligatorily included and can be omitted from the string only under specific grammatical and pragmatic circumstances. There is a rich literature that addresses what those circumstances are, and we will review that literature below. One overarching theme is that the referent of an omitted argument is recoverable. In fact, in many cases, the unexpressed argument is still present in the semantic representation. In contrast, adjuncts do not need to be recoverable in order to be omitted: it is their *inclusion* which must be justified, not their exclusion.

Scholars working on different phenomena in many languages and in a variety of frameworks have gained insights into patterns of argument omissions. Sections 2 and 3 summarize those insights and make use of them to show that argument omission is not always possible, but in fact systematically restricted. We begin with a discussion of *pro-drop*, as pro-drop constitutes what is perhaps the most blatant counterevidence (or, we suggest, *apparent* counterevidence) to the obligatoriness claim. Section 2.1 addresses "Italian-style" morphological pro-drop, where information (typically person and number information) about omitted independent pronouns remains on the head in the form of agreement marking. Section 2.2 then discusses a phenomenon that has been called *radical* or *discourse* pro-drop, where pronominal arguments can be dropped even though there is no morphological information on the head that gives hints about how to interpret the pronouns. Section 3 turns to omitted arguments in English, which is not a pro-drop language. Section 3.1 outlines circumstances under which it is possible to omit subjects in English, and section 3.2 is concerned with complement omis-

sion. Section 4 discusses the admissibility of adjuncts. The patterns and restrictions that govern the inclusion of adjuncts are pragmatic in nature, and they have not received much attention in the literature. We review some research that portrays adjuncts as contributing to answers to *questions under discussion* (QUDs).

In short, we argue that arguments and adjuncts differ crucially with respect to obligatoriness: Arguments are obligatorily included unless certain grammatical conditions (e.g., control of an infinitival subject) and pragmatic conditions (e.g., recoverability in context) hold. Adjuncts, on the other hand, are never grammatically obligatory, and they are not included by default. In fact, unless the relevant pragmatic conditions are met, adjuncts are generally excluded.

2 Pro-drop

Many languages allow *pro-drop*, the omission of pronominal arguments. Pro-drop constitutes potential counterevidence to the generalization that arguments are obligatory, since it allows regular argument positions in the syntax to be (phonologically) empty. However, research indicates that pro-drop is highly principled and restricted. Generalizing across languages: pro-drop is permitted when the relevant referential information can be recovered from morphology on the head or the context (often both). Agreement-based pro-drop and discourse pro-drop are discussed in turn below.

2.1 Agreement-based pro-drop

In agreement-based pro-drop, agreement marking on the head expresses features matching those of the omitted pronominal argument. These features are commonly number and person, and sometimes also gender and animacy. Agreement-based pro-drop is illustrated by the Finnish example in (2):

(2) (Minä) katso-i-n televisio-ta.
1SG.NOM watch-PAST-1SG television-PART
'I watched television.'

The subject *minä* is syntactically optional. The affix *-n* on the verb agrees with *minä* in person and number. When *minä* is absent, *-n* still indicates that the subject is first person singular. Agreement-based pro-drop is cross-linguistically very common and occurs in, for

example, Italian (Burzio 1986), Turkish (Bayram 2013), Chichewa (Bresnan and Mchombo 1987), Wolof (Dione 2013) and ASL (Pfau and Bos 2016).

Example (2) illustrates subject pro-drop, which is the most common type of pro-drop. However, object pro-drop also occurs in a number of typologically distinct languages such as Welsh, KiRimi, Khanty, Plains Cree and Imbabura Quechua. An Imbabura Quechua object pro-drop example is provided in (3):[2]

(3) kan-ga kuchillu-wan (ñuka-ta) kuchu-wa-rka-ngui
2-TOP knife-INSTR 1SG-ACC cut-1SG.OBJ-PST-2SBJ
'You cut me with a knife.'

Note that adjuncts cannot undergo agreement-based pro-drop since verbs do not agree with adjuncts.[3]

Theoretical accounts of agreement-based pro-drop do not posit that the pro-dropped arguments are actually missing from the syntax. In various versions of Government and Binding Theory and Minimalism, for example, the pronominal features are assumed to be present in the syntactic structure, even though they do not surface as phonologically overt independent pronouns. According to one commonly adopted proposal, the relevant features are associated with a phonologically null element (often called 'little *pro*') in subject position. Another proposal holds that the features are affiliated with an Agr(eement) head and spelled out as agreement marking morphology. For an overview of different Principles and Parameters approaches of *pro*-drop, see Barbosa (2011).

Alternative analyses can be found in other theoretical frameworks, for example Lexical Functional Grammar (LFG). According to the standard LFG analysis of agreement-based pro-drop, the agreement marking affix takes on the role of the pronoun when no independent

[2]The Imbabura Quechua (now often referred to as Kichwa) example is from Willgohs and Farrell (2009) and Jake (1985). See Sadler (1997) for Welsh, Hualde (1989) for KiRimi (also called Nyanturu), Nikolaeva (1999) for Khanty (formerly called Ostyak), and Dahlstrom (1991) for Plains Cree.

[3]Applicatives do not provide a counterargument to the claim that verbs do not agree with adjuncts. In some languages, applicative forms of verbs agree with the applied argument. This is illustrated in the Shangaji example in (i), where the noun class 2 object marker *-aa-* agrees with the applied object *aána* (Devos and Guérois 2022):

(i) Kaaw-úúzany-el-e nakhuúwo aána.
SM1SG.OM2-buy-APPL-PFV 1a.maize 2.children
'I bought maize for the children.'

However, this is not counterevidence to the claim that verbs do not agree with adjuncts. Applied arguments (such as *aána* in (i)) are syntactically arguments, even though they may carry the same semantic role as adjuncts in non-applicativized sentences.

pronoun is present. In example (2) above, the morpheme *-n* is ambiguous: it functions as an agreement marker when *minä* is present and as an incorporated pronoun when *minä* is absent. For details on how this proposal is formalized in LFG, see Bresnan and Mchombo (1987), who were among the first to argue for this analysis. Toivonen (2023) provides an overview of the literature on pro-drop in LFG.

Common to the different theoretical approaches to pro-drop is that the missing pronoun is closely tied to the agreement morphology on the head. Since the agreement morphology provides information that helps identify the arguments, the pronominal information is not so much *missing* as expressed by alternative means.

We conclude that agreement-based pro-drop does not constitute counterevidence to the claim that arguments are obligatory. The clause contains forms that provide information about the pronominal arguments, even though the pronouns are not present in the string as phonologically expressed independent words.

2.2 Discourse pro-drop

In discourse or 'radical' pro-drop, the omission of pronominal arguments is regulated by pragmatic constraints. Given the proper discourse context, pronouns can be dropped even though no agreement morphology is displayed on the head. Consider the Mandarin examples below, due to Huang (1984,537):

(4) (ta) lai-le.
(s/he) came-PERF
'S/he came.'

(5) Lisi hen xihuan (ta).
Lisi very like (him/her)
'Lisi likes him/her very much.'

The pronoun *ta* can be dropped as the subject in (4) or the object in (5). Unlike the Finnish and Imbabura Quechua examples in (2) and (3) where agreement on the verb encodes the person and number of the omitted arguments, the Mandarin verbs in (4)-(5) do not provide this kind of information. Nevertheless, (4) and (5) have a straightforward interpretation in the particular discourse context in which they are uttered, such that identification of the missing argument does not involve any more guesswork than it does in (2) and (3). Indeed, the use of an empty pronoun like in (4) or (5) "signals to the hearer that the speaker is so sure that the propositional content of the utterance makes clear which referent to supply for the missing

argument of a verb that no syntactic argument at all needs to be expressed" (Rosén 1998,137-138).

This suggests that discourse pro-drop may not be so 'radical' after all: it is simply regulated by constraints which are pragmatic in nature rather than morphological.[4] These constraints have been formulated somewhat differently depending on the author and framework, for example in the Familiarity Scale (Prince 1981), the Accessibility Marking Scale (Ariel 1988, 1990), Relevance Theory (Sperber and Wilson 1986) and Centering Theory (Kameyama 1985, Grosz et al. 1995). Here we will adopt the characterization in Rosén (1998), but our main point is not tied to the details of this (or any) particular analysis.

To begin, consider the Vietnamese example pair below due to Rosén (1998,139-140):

(6) Hôm qua ông Ba tặng anh Lan một cái đồng hồ bằng vàng.
yesterday Mr. Ba give Mr. Lan one CL watch made-of gold
'Yesterday Mr. Ba gave Mr. Lan a gold watch.'

(7) Hôm nay **e** tặng **e** một cái máy điện toán mới tinh.
today give one CL machine electric calculate new pure
'Today (he) gave (him) a brand new computer.'

Example (7) contains two instances of pro-drop: both the subject and the object pronoun have been omitted. In the context of (6), (7) must be interpreted with Mr. Ba as the referent of the dropped subject and Mr. Lan as the dropped object; (7) cannot mean that Mr. Lan gave the computer to Mr. Ba, or that some other person(s) could have given and/or received the new computer.

For Rosén (1998), these pronouns may be dropped because their intended referents are referentially and relationally given. The requirement of referential givenness ensures that empty pronouns can only be used to refer to entities that are easily and uniquely identified (Gundel et al. 1993, Kameyama 1985, Jung 2004). For example, there are two individuals established in (6), Mr. Ba and Mr. Lan. Those individuals can later be referred to via empty pronouns in (7) since they are already given in the context of (6). As such, (7) could not mean, for example, that Mr. Ba's daughter gave her friend a new computer, since the referential givenness of those two individuals has not been established.

[4]Looking beyond agreement marking on the head which was the topic of section 2.1, some scholars have argued that the morphological characteristics of a language are indeed relevant. For example, Neeleman and Szendröi (2007) suggest that discourse pro-drop is only permitted in languages where personal pronouns are agglutinating for case or some other nominal feature. Their proposal does not address the pragmatic conditions required for discourse pro-drop to take place, which is the goal of this section.

However, referential givenness alone is not sufficient to explain the restrictions on the use of empty pronouns. In particular, it cannot capture why (7) can only mean that Mr. Ba gave Mr. Lan the new computer, not that Mr. Lan gave it to Mr. Ba. Rosén therefore argues that the intended referents of empty pronouns must also be *relationally* given. Consider again (6). It establishes the grammatical relations between Mr. Ba and Mr. Lan and the 'giving' event described by the verb: Mr. Ba is the agent and Mr. Lan the recipient. Although (7) expresses a different proposition from (6), the use of empty pronouns in (7) requires the listener to infer that the roles of Mr. Ba and Mr. Lan in relation to the giving event are the same. Crucially, it is only the relation itself that must be identical in order for empty pronouns to be licensed, the particular verb may differ. This is further illustrated in example (8) taken from Rosén (1998,140):

(8) Anh nhanh tay tóm được một con quạ, **e** định quật chết **e** ...
he quickly hand seize manage one CL crow, intend kill
'He quickly managed to catch one crow, and (he) thought of killing (it)...'

In (8) the two clauses contain different predicates. The use of empty pronouns here requires the listener to infer that the thematic roles of agent and patient established for *manage to catch/seize* (here *he* and *one crow*) carry over to *thought of killing* in the second second clause.

In sum, the omission of pronouns in languages with discourse pro-drop is restricted by the discourse. These restrictions were discussed in this section in terms of referential and relational givenness (Rosén 1998). The important conclusion is that previous research has shown that argument omission in discourse pro-drop is principled and it is not the case that arguments are dropped at random.

2.3 Summary and remarks

This section was organized around a distinction between agreement-based pro-drop (Section 2.1) and discourse pro-drop (Section 2.2). The general idea is that the agreement-marking on the verb provides information about the dropped pronouns in the former type but not the latter, where the necessary information is retrieved solely from the discourse.

However, there are at least two reasons why the distinction between the two types of pro-drop is in fact not so clear-cut. One reason is that agreement does not always provide detailed information about the dropped pronouns. In many languages with agreement-based pro-drop, the agreement marking provides less information than the omitted pronouns (for a useful

overview, see Pereira 2021). For example, Spanish third person pronouns are marked for gender, but third person verbal agreement markers are not. Another example is Aghu (Awyu-Dumut, Trans-New Guinea), which is also a pro-drop language (van den Heuvel 2016,180–181). In Aghu, the verb does not agree in number when the subject is low on the animacy scale (low animals and inanimates). Furthermore, while personal pronouns distinguish between first, second and third person, the Aghu verbal agreement markers distinguish only between first person and non-first person, and not between second and third person. van den Heuvel cites Drabbe (1957): "*Nu* and *nugu* [1st person singular and plural] are not often used as subject of a verbal clause, as in such sentences the person is clear from subject inflection on the verb. The 2nd and 3rd person pronouns are attested more frequently, as verb inflection does not distinguish between 2nd and 3rd person, but when it is clear from the context which person is intended they are often left out."

This quote mentions context, which brings us to the second reason why the two types of pro-drop are not so clearly distinct after all. Context and discourse conditions are highly relevant for agreement-based pro-drop as well as for discourse pro-drop.

Consider the Italian example in (9) (Holmberg 2010,88). Although it is grammatical, it would be pragmatically odd if uttered out of the blue as the context does not provide the means to identify the referent of the missing argument:[5]

(9) Verrà.
come-FUT-3SG
'He will come.'

Relational givenness may also be relevant to agreement-based pro-drop. Consider (10), due to Alonso-Ovalle et al. (2002,153-154). The context of the first sentence makes salient two individuals, Juan and Pedro, which are potential antecedents for the (null) pronoun in the second sentence:

(10) Juan pegó a Pedro. ***(pro)*/Él** está enfadado.
Juan hit Pedro he is angry
'Juan hit Pedro. He is angry.'

[5]The English version of (9) also sounds odd out of context. This is because the licensing of unstressed pronouns in English seems to largely parallel the contexts in which empty pronouns are licensed (and preferred) in languages with pro-drop (Kameyama 1985, Rosén 1998). Stalnaker (1998,11) notes about English pronouns that they "require a context in which a certain individual of the appropriate kind is uniquely salient or in some way available for reference". This is generally true of pronouns, null or overt.

In an experiment, participants were asked to assign a referent to the subject of the second sentence. Alonso-Ovalle et al. (2002) found that when the second sentence contained *pro* it elicited significantly more *Juan* responses than when it contained *él*. They discussed this in terms of the Position of Antecedent Hypothesis of Carminati (2002) in which *pro* prefers a subject antecedent over an object antecedent. However, relational givenness would also enforce a subject antecedent in this case: since Spanish pro-drop is restricted to subjects, then it is not surprising that *pro* will typically prefer a subject antecedent as this preserves the grammatical relation.

We end our discussion of pro-drop by reiterating the main point of this section. On the face of it, the existence of pro-drop seems like clear counterevidence to the obligatoriness requirement for arguments: the dropped argument is not overtly expressed in the linguistic string. However, even when the pronouns are not pronounced, their interpretation is recoverable from agreement marking and/or the context. The pronominal information is still present in the semantic representation.

3 Argument omission in English

There are some languages (e.g., French and Swedish) that do not allow the kinds of pro-drop discussed in the previous section. However, even non-pro-drop languages sometimes omit arguments. In this section, we review the literature on argument omission in the non-pro-drop language English. We first discuss subjects in section 3.1, and then complements (mostly direct objects) in section 3.2. We end the section with some brief comments on cross-linguistic considerations (section 3.3).

3.1 Subjects

It has been proposed that all clauses have syntactic subjects. This proposal has, for example, been spelled out as the Extended Projection Principle in Government and Binding Theory (Chomsky 1981) and the Subject Condition in Lexical Functional Grammar (Bresnan 2001, Bresnan et al. 2016). The proposed subject requirement has been widely discussed and criticized (see, e.g., Kibort 2006), and the requirement may have some exceptions. For example, the requirement might be parameterized; weather verbs might genuinely lack subjects in many languages; etc. It nevertheless remains true that clauses show an overwhelming tendency to require subjects, although those subjects are not necessarily overtly expressed (as we have already seen in the pro-drop section above).

In English, subjects are often obligatory, as illustrated in (11):

(11) (*She) likes to play basketball.

However, there are certain conditions that allow pronominal subjects to be omitted even in English, a non-pro-drop language. These conditions have been carefully examined in the literature, and an overview of that literature is provided below.

3.1.1 Morphosyntactic subject suppression

There are some well-known clause types where subjects may or must be omitted because our grammars contain specific grammatical mechanisms or forms that license the omission. For example, certain relation-changing operations such as regular passives (12), pseudopassives/prepositional passives (13) and middles (14) suppress the active subject and promote the object (or prepositional object) to grammatical subject:

(12) The taxi was cancelled (by Tara).

(13) The paper was scribbled on (by Kim).

(14) The paragraph reads well.

The interpretation of the "original" subject of passives and pseudopassives can often be retrieved as it is provided in an adjunct *by*-phrase or is clear from the context. The agent interpretation can also intentionally be generic: this is typically the case for the interpretation of the understood subject of middles.

As far as we are aware, there are no comparable relation-changing operations that serve to suppress or demote adjuncts. This is unsurprising, since adjuncts are already optional and not generally expected to be present. Relation-changing mechanisms can only act on adjuncts by *promoting* them. For example, adjuncts can be promoted to arguments in prepositional passives (e.g., Findlay 2016) and applicatives (e.g., Arka 2014). Certain applicative-like English constructions such as "dative-shifted" benefactive NPs (e.g., Bruening 2021) and personal datives (e.g., Wood and Zanuttini 2018) also involve the promotion of adjuncts to object arguments. Arguments differ from adjuncts in this respect: in relation changes, arguments can be promoted (e.g., object to subject in passives), demoted (e.g., direct objects to secondary objects in dative shift, or to obliques in antipassives), and suppressed (e.g., passives, antipassives, middles).

Non-finite clauses, such as *to ski* in (15), constitute a different type of clause that lacks an

overt subject:

(15) *Carmen likes to ski.*

The agent of *to ski* in (15) is interpreted as the matrix subject, *Carmen*. The infinitival subject is often the same as the subject of the embedding verb. The interpretation of the subject of non-finites is the topic of the literature on what is often referred to as *control*. This research shows that the principles that govern control are regular and principled. We will not review this rich and intricate literature here, but Bresnan (1982a) is a classic reading on control in English.

The subject is also typically omitted in imperative clauses, as in (16):

(16) *Take out the garbage!*

The understood subject of imperatives is second person (the addressee).

In sum, a number of morphosyntacic mechanisms dictate suppression of the subject. These mechanisms are employed in contexts where the agent (or highest argument) of the verb is intentionally left vague or is easily recoverable from the context.

3.1.2 Register-based subject omission

Certain spoken and written registers allow subject omission in active finite clauses, where the morphosyntax would regularly call for overt subjects. Weir (2012) and Haegeman (2017) stress that spoken and written registers are different with regard to subject omission, and we therefore consider speech and writing separately in our discussion below.

Examples (17)-(18) illustrate the omission of subjects in informal registers of spoken English:

(17) Don't think so.

(18) Seems like it.

The understood subject of (17) is *I*, and the understood subject of (18) is *it*.

Subject omission in informal speech is restricted by a number of conditions outlined in Thrasher (1974), Napoli (1982), Weir (2012), a.o. Some of the conditions are discourse related; for example, focused subjects cannot be omitted. The referent must also be recoverable from context, but not necessarily the *linguistic* context, other factors can be at play as well. For example, first person seems to have a privileged status: the speaker is available as a pos-

sible subject referent even when not explicitly mentioned in the previous discourse context. Consider the passage in (19):

(19) Marie gave a talk yesterday. Never liked her.

In our judgment, it is possible to drop the subject in the second sentence of (20). Our intuition is that the subject of *like* is naturally interpreted to be first person (*I never liked her*). However, (19) can be contrasted with (20):

(20) Marie gave a talk yesterday. Didn't love it.

In our judgment, it is possible to drop the subject in the second sentence. We also have the intuition that the second sentence can be interpreted in two ways: one interpretation is that Marie did not love giving the talk, and the second interpretation is that the first person narrator did not love (listening to) the talk. This is a case where the broader context, perhaps of what is previously known about Marie or the speaker, will help determine the interpretation. The passages in (19)–(20) can further be contrasted with (21):

(21) Marie gave a talk yesterday. Didn't use PowerPoint.

A first person interpretation is not easily accessible here because the meaning of the sentence so strongly favors an interpretation where *Marie* is the person who did not use PowerPoint. Together the examples in (19)–(21) show that a first person interpretation of a dropped subject can sometimes but not always override the intuition that the subject is interpreted as the nearest available discourse referent. The specific lexical content of the sentence and general knowledge about the relevant participants also influence the interpretation. However, it is important to note that it is still not the case that *any* referent is possible: the options are restricted.

In addition to the discourse conditions, there are also phonological conditions at play that determine the possibility for subject omission in informal speech. In order to be omissible, the subject must be prosodically weak. Moreover, it must be utterance-initial (Thrasher 1974, Napoli 1982, Weir 2012). The latter point is illustrated in (22)-(23), from Thrasher (1974, 7):

(22) Thought I heard something.

(23) *I thought heard something.

Building on Napoli (1982), Weir (2012) proposes a phonological analysis of pronominal sub-

ject omission in informal spoken English. The analysis is structured around an Optimality Theoretic (violable) constraint that demands that prosodic constituents begin with a prosodically strong element. We refer to Napoli (1982) and Weir (2012) for details on the analysis which accounts for the phonological conditions on subject omission in a principled way. Although this phonological analysis does not make direct reference to pragmatics, we note that pragmatics and prosody are not entirely unrelated.[6]

Certain written registers also allow the occasional omission of subjects. Perhaps most well-known is *diary drop*, subject omission in diaries (Haegeman 1990, Scott 2010). The following two examples are taken from the diary that Robert F. Scott wrote during his team's expedition to the South Pole:[7]

(24) Have been out over the Gap for walk.
(Monday, March 27th 1911)

(25) Held service in hut this morning, read Litany.
(Sunday, March 26th 1911)

Scott (2010) provides a Relevance Theory analysis of diary drop. She argues that pronominal subjects can readily be dropped in diary contexts because the referent is highly accessible (p. 214): diaries are written in first person. In addition, she argues, the subject omission contributes to the style and tone as casual and intimate (p. 216).

Haegeman (2017) connects diary drop to subject omission in several other written registers, such as list-type summaries and stage directions. She argues for a cartographic analysis of subject drop. She shows that written subject omission across the different registers is restricted to root clauses. In addition, written subject omission is incompatible with subject-auxiliary inversion, *wh*-fronting and argument fronting.

In sum, it is possible for subjects in English to be unpronounced in regular finite clauses in informal speech and also in certain written registers. However, subjects are not freely dropped in these registers. Instead, the research by Scott (2010), Weir (2012), Haegeman (2017), and others shows that subjects are omissible only under certain restricted circumstances. Abstracting away from the details, the generalization seems to be that unstressed subjects can be omitted when they occur utterance-initially and are recoverable from the context.

[6] As Pierrehumbert and Hirschberg (1990) put it: "Accented material is salient not only phonologically but also from an informational standpoint. And items that are deaccented, by extension, do not undergo this salience marking – although they may already be salient or become salient by other means" (289).

[7] *Robert Falcon Scott South Pole expedition, Diaries*. Chapter VII: At Discovery Hut.

3.1.3 Summary and remarks

Subjects are in many cases obligatorily expressed in English. However, as the literature reviewed in this section has shown, there are some circumstances under which subjects are omitted. These circumstances are principled and constrained by the morphosyntax (e.g., grammatical voice), register (e.g., diary register), and syntactic environment (e.g., the presence of fronted syntactic material).

The discussion in this section separated the morphosyntactic suppression of subjects from register-based subject omission, since certain registers allow subject drop even in syntactic positions where subjects are allowed by the grammar. However, the two types of subject drop are not independent of each other. This point can be illustrated by the recipe register, where subjects are often excluded. The recipe register contrasts with the diary register in that recipes do not simply drop subjects in regular indicative finite clauses. Instead, the imperative form is commonly used, as example (26) illustrates:

(26) Peel two potatoes; finely dice and place in a small bowl.
(`https://www.tasteofhome.com/recipes/potato-salad-bites/`)

The use of the imperative makes intuitive sense in recipes, since recipes are instructions to an addressee. However, languages differ in what morphosyntacic mechanism they use for subject suppression in recipes. Paul and Massam (2021) present a careful cross-linguistic study of dropped arguments in recipes. They show that recipes are alike across languages in that subjects (and objects) are frequently omitted. Imperatives are used in English, Niuean, Tagalog, and French. French can also use the infinitive form of the verb, as can German. Bulgarian uses the middle form. Malagasy recipes use the non-Actor Topic form, which is compatible with the omission of agents. The recipe register illustrates that there is not necessarily a one-to-one mapping between the linguistic mechanism that is utilized to suppress the subject (section 3.1.1) and the pragmatic context for subject omission (section 3.1.2).

The goal of this section has been to review some of the grammatical and pragmatic conditions and rules for subject omission that previous scholars have proposed. The pragmatic conditions overlap with the conditions for discourse pro-drop (section 2.2): subjects are likely to be omissible when the intended reference is easily recovered from the discourse context or the register. For example, the subject is expected to be first person in diaries and second person in recipes.

We conclude that it is sometimes possible to omit subjects in English, but the omission is not unprincipled. Instead, it is restricted by identifiable, interacting constraints of grammar,

discourse and register.

3.2 Complements

Like subjects, complements are sometimes omissible. However, complement omission differs from subject omission in that it depends in large part on the lexical verb. The verbs *eat, drive,* and *read* belong to a class of verbs that can occur quite freely without objects, as long as the omitted objects denote something that is expected for their verbs (see, e.g., Fillmore 1986; Levin 1993, 33; Adger 2003, 83):

(27) Sam ate before he took a nap.

(28) Kim drove to work this morning.

(29) Sarah likes to read in the evenings.

In these examples, the objects are understood to be something that is typically eaten (a meal), driven (a car), or read (a book). The unpronounced objects are not interpreted as non-prototypical but possible objects of *eat, drive, read* such as those in (30)–(32):

(30) Sam ate his brother's socks.

(31) Kim drove a tank yesterday.

(32) Sarah likes to read warning signs in elevators.

The type of object omission illustrated in (27)–(29) is referred to as indefinite or existential object omission. No discourse antecedent for the omitted object is needed to interpret the sentences. Note, however, that if the object refers to something that is *not* prototypical for the verb as in (30)–(32), it needs to be mentioned or clear from the context, otherwise the utterance will be judged as misleading at best and false at worst. For example, imagine telling your friend (33):

(33) Your little sister was eating when I visited her last night.

If it later becomes known that the sister was eating snow or her own hair, the friend will feel that they have been misled or even lied to. Adjuncts are different in this respect: although it might be true that there are typical times, places and manners for various activities, omitting that information will not result in a misleading or false utterance. For example, if an addressee who has been told (33) later finds out that the sister was under a table at 3am using a screw-

driver to eat, it might seem odd that the information about time, place and instrument was left out, but (33) will still not to be judged as false or misleading.

Another class of verbs allows the omission of objects or other complements only when the context makes clear what the omitted object is. This is called definite or anaphoric object omission and is illustrated in (34)–(36):[8]

(34) Sam won.

(35) Kim reluctantly agreed.

(36) I didn't notice.

Examples (34)–(36) require a specific context to be acceptable. For example, (34) is acceptable if it occurs after *There was a tennis game yesterday.* For more discussion of the nature of indefinite and definite omitted objects and the differences between them, see Fillmore (1986), Condoravdi and Gawron (1996), Mittwoch (2005), Williams (2015), and others.

As the examples above illustrate, a number of verbs allow objects to be omitted when their meaning can be recovered, either because the intended object meaning is prototypical for the verb or because it is provided by the context. However, there are still many verbs that do not seem to allow their objects to be omitted, at least not easily:

(37) *Martha destroyed/criticized/greeted/sold/admired.

A verb like *destroy* does not allow object omission even when the context clearly specifies the intended referent:

(38) *Tammy didn't like Mick's sculpture, so she destroyed.
[intended: ... *so she destroyed it (=the sculpture)*]

Examples (37)–(38) serve as a reminder that the omission of objects in English is generally quite restricted, as noted by Bhatt and Pancheva (2006,22) and others.

A verb's capacity to omit its object is at least partly lexically determined, but that does not necessarily mean it is arbitrary. Verbs might be formally specified for optional objects in the lexicon, but the reason why some verbs (or verb classes) and not others come to carry that specification can have a semantic or pragmatic explanation. Glass (2021) appeals to

[8]The complement of *agree* is not a direct object, and the complement of *notice* may but does not have to be a direct object. We have not systematically explored the potential significance of the specific complement function carried by the the omitted argument.

routines as a possible explanation. She presents experimental and corpus evidence suggesting that verbs that describe routines are more likely to allow object omission than verbs that do not describe routines. Glass defines routine as "a series of actions that are well-known and conventional within a community" (p. 53). This means that subcommunities can recognize their own specialized routines. Glass provides the example of *lifting weights* within strength-training communities. In a corpus study of Reddit groups, she shows that the verb *lift* is indeed used without an object more often in strength-training communities than in general Reddit communities.

A further example of community-specific object omission is provided by the verbs *buy* and *sell* in real estate contexts. In general, the verbs *buy* and *sell* do not easily allow object drop, but consider example (39), which is an attested example from a real estate web page:[9]

(39) If you are selling in a market that isn't as busy as the one you are trying to buy into, then selling first is likely the better option.

Since example (39) is taken from a real estate web page, it is clear that the intended object of *buy* and *sell* is a house. However, in other contexts, these verbs resist object drop, even when the intended referent of the object is clear:

(40) *I got tired of my car just a couple of months after I bought.

The real estate examples follow from Glass's proposal that the notion of *routine* is important for when complements can be omitted. However, other possible factors have been shown to play a role as well. For example, Goldberg (2006,196) formulates a general principle that states that patient omission is possible when "the patient argument is construed to be de-emphasized in the discourse vis-à-vis the action". For further proposals and discussion, see Resnik (1996), Kiparsky (1997), Rappaport Hovav and Levin (1998), Goldberg (2001), Jackendoff (2002), Rappaport Hovav and Levin (2010), Asudeh et al. (2014), Wechsler (2015), David (2016), Melchin (2018). In common for these proposals is the observation that complements in English are by default overtly expressed.

We conclude that object drop in English is restricted, but nonetheless permitted in certain circumstances. Previous research has narrowed down specific conditions that go a long way towards explaining the data. Similar to pro-drop and subject omission, objects are more likely to be omissible when their reference is recoverable.

[9]Example (39) is from `https://www.rightathomerealty.com/buy-or-sell-first`. On this page, the objects of the verbs *buy* and *sell* are dropped 19 out of 26 times.

3.3 Beyond English

This section has focused on English, but the option to omit arguments is available in other languages as well. In fact, Goldberg (2006, 106) claims that, given the appropriate circumstances, argument omission is possible in *all* languages, and we believe that she is probably right. It is of course important to recognize that the grammars of individual languages will limit the possibilities of argument expression and omission. For example, there are languages that do not permit pro-drop (e.g., English, French, Swedish). Also, each language will have its own inventory of relation-changing operations such as passives and anti-passives, and the exact behaviour of those operations may vary between languages. For example, not all languages allow the passive subject (or the anti-passive O) to be expressed as an oblique. We will not attempt a cross-linguistic overview, but we provide a few cases that illustrate some of the richness of the relevant cross-linguistic data. In Kanakanavu, unexpressed agents of dynamic verbs are interpreted as coreferential with a topical discourse participant in perfective clauses, and as having generic reference in non-perfectives (Cheng 2023). Cree relational morphology introduces an argument that cannot be overtly expressed as a dependent on the verb (Junker and Toivonen 2015). Innu has a class of logically transitive verbs that are morphologically intransitive when they occur without objects or with proto-typical objects (e.g., *board a car*), but the same verbs must have applicative morphology in order to combine with an unusual object (e.g., *board a tree trunk*) (Drapeau 2011). Finally, transitive verbs in Thulung Rai can occur with a valence-reducing morpheme which incurs one of four different effects (depending in part on the base verb): reflexive, reciprocal, antipassive and anticausative (Lahaussois 2016). These phenomena and others illustrate that the grammars of individual languages cannot be ignored. Even though it is possible to generalize over the discourse conditions that lend themselves to argument drop, individual languages contribute their own grammatical specifications that play an important role.

Du Bois (1987) notes that there is a cross-linguistic tendency in natural discourse to limit the number of a full lexical NP arguments to a maximum of one per clause. This discourse tendency has been shown to be quite strong in many languages; for example, Sacapultec (Du Bois 1987), Mandarin Chinese (Tao and Thompson 1994), Tuscarora (Mithun 2001), Tafora Baruga (Farr et al. 2006, 55), and O'dam (Everdell 2023, 267). Since many languages also allow pro-drop (Section 2), this means that it is not uncommon for arguments to remain unexpressed in discourse. However, arguments new to the discourse are still overtly expressed, and we believe that the generalizations derived from the literature reviewed in sections 2 and 3 hold cross-linguistically: only arguments whose reference is readily recovered from the

context or whose interpretation is generic or prototypical can be omitted.

4 Adjuncts

The literature reviewed in the sections above has shown that there are grammatical restrictions on argument-drop, and these restrictions vary cross-linguistically. In cases where the syntax permits null arguments, pragmatic constraints determine whether the arguments can be left unexpressed. Arguments can only be excluded if the exclusion is specifically permitted and justified by the grammar and the context. In this section, we argue that this is not the case for adjuncts, whose *inclusion* instead needs to be justified.

For both arguments and adjuncts, the repetition of full referential XPs will appear clunky (unless perhaps it is done to achieve some specific rhetorical or discourse effect). However, the contrast between arguments and adjuncts is clear in the use of pro-forms. The repeated inclusion of argument pronouns is natural and often even required by the grammar, whereas the presence of adjunct pro-forms is not required by the grammar and their repeated inclusion sounds unnatural. For example, consider the locative and temporal pro-forms in (41):

(41) # John went shopping at the mall yesterday. He wanted to buy jeans there then. He found a great pair there then.

Even though every sentence in (41) is grammatical, the passage sounds odd and would require special intonation and some elaboration to sound natural (e.g., *right there and then*).[10] We propose that the oddness of (41) is due to the fact that the pro-forms *there* and *then* are not pragmatically licensed in the context. In contrast, consider the passage in (42) where the locative pro-form in sounds natural:

(42) Mary wanted to go back to the mall. She had lost her wallet there.

In this example, the location is relevant: the mall is the place where Mary lost her wallet, which explains why she wanted to return there. The pro-form provides crucial information, and the interpretation would be quite different without it.

Argument pro-forms, on the other hand, are readily included and repeated throughout a narrative. The passage in (41) can be contrasted with the ones in (43) and (44):

[10] Although *there and then* may sound more natural, it has a somewhat different meaning than *there then*.

(43) John found an axe yesterday. He liked it, but he didn't know what to do with it. First he sharpened it, and then he gave it to his neighbor.

(44) Sam wrote an essay yesterday. After having written it, he took his time to study it carefully. He took a break, then he read it one more time before submitting it.

The repetition of argument pronouns *he* and *it* in (43) and (44) does not result in the same awkwardness as the repetition of adjunct pro-forms in (41). Example (44) shows that this is the case even when the pro-form is the complement of indefinite object omission verbs, such as *write*, *study* and *read*.

The examples in (41)–(44) illustrate that pronominal adjuncts are used only when they are central to the discourse, but pronominal arguments are more freely included. In fact, recall from the section on pro-drop (section 2) that argument pronouns are by default included, and can only be excluded ('pro-dropped') under very circumscribed conditions. Adjuncts do not figure in discussions of pro-drop because it is their *inclusion* that is constrained, not their omission. Note also that adjuncts cannot undergo *agreement-based* pro-drop, since they do not agree with the head.

The pragmatic licensing of adjunct pro-forms or adjuncts more generally has not received much attention in the literature. An exception is Brunetti, De Kuthy & Riester (2021), who draw on the notion of *question under discussion* (QUD) in their analysis. They argue that adjuncts can have a number of different informational and discourse properties. First, they might contribute to answering the main QUD. As an answer to the QUD, adjuncts might be focused information, background information, or contrastive topics, and they do not necessarily provide new information. Second, they might not contribute to the answer to the main QUD but instead provide supplementary information. In this case, Brunetti et al. argue, the information is new and answers a different QUD. Consider the question answer-pair in (45), provided by Brunetti et al. (2021,22) but originally due to Ramm (2005):

(45) – When did you arrive?
– I arrived yesterday evening *with some friends*.

In (45), *yesterday evening* answers the main QUD, but *with some friends* does not. The *with* phrase instead answers its own QUD, on the analysis provided by Brunetti et al. (2021).

If Brunetti et al. (2021) are right, then adjuncts either contribute to the answer to the main QUD or provide new, supplementary information. We suggest that the pro-forms in (41) sound odd because they are not relevant for the QUDs of the second and third sentence,

and the information they contribute is discourse old. Consider also (46):

(46) # Sue and Ali spent Tuesday evening together. They first went for a walk on Tuesday evening. Then they saw a movie on Tuesday evening. After that, they had tea and cake on Tuesday evening.

The adjunct *on Tuesday evening* provides old information and is not central to the main QUDs. The passage is therefore pragmatically odd.[11]

This characterization of how adjuncts are licensed may not be complete, but it does seem to be the case that pragmatic consideration is responsible for when adjuncts are felicitously included in the discourse. However, even though the syntax and semantics do not dictate whether adjuncts be included or excluded, there are of course also some purely grammatical restrictions on their distribution and form. For example, an adjunct must be semantically appropriate for the head it modifies. To cite a famous example, it is semantically odd for *ideas* to be modified by *green*, and for *sleep* to be modified by *furiously*. Syntactically, adjuncts can be included quite freely, as long as the word order and type of modifier do not violate grammatical constraints. For example, nouns are modified by adjectives, verbs by adverbs, and not vice versa. For a number of insights about the semantic and syntactic properties of adjuncts, such as word order and co-occurrence restrictions, see Ernst (2002, 2020). Setting these restrictions aside, what is crucial for the main point of our paper is that individual heads do not specifically demand that they must (or cannot) be modified by an adjunct.[12]

In sum, arguments differ from adjuncts in that it is not necessary to justify the exclusion of adjuncts. Instead, the inclusion of adjuncts needs to be motivated. Based on the findings in Brunetti et al. (2021), we suggested the primary motivation for including adjuncts is whether or not they are relevant to answering the main QUD.

5 Conclusion

The evidence considered in this paper indicates that arguments are overtly included in the sentence unless the grammar and discourse allow or require them to be omitted. Sections 2–3

[11] The passage in (46) also involves the repetition of referential XPs, which is independently dispreferred, as mentioned above. This is not the case for (41), where pro-forms, but not referential XPs, are repeated.

[12] Some interesting potential counterexamples to the claim that adjuncts are never selected have been noted by Jackendoff (1990), Grimshaw and Vikner (1993), Goldberg and Ackerman (2001,a. o.). The potential counterexamples are various resultative constructions (e.g., *John laughed himself sick; Sue sneezed the tissue off the table*), English middle constructions (e.g., *Cotton shirts iron easily*), and passives of verbs of creation (e.g., *The best tomatoes are grown in Italy*). We set these interesting constructions aside here.

consist to a large extent of summaries of the constraints on argument omission that have been proposed in the literature. There is no parallel literature on constraints on *adjunct* omission. The reason for this is that adjuncts are not syntactically required. The admissibility conditions for adjuncts are thus strikingly different than for arguments: The question is not when adjuncts can be excluded, the question is rather when they can be included. Our intuition is that adjuncts are included only when they are pragmatically relevant or necessary. We illustrated this intuition with some examples in section 4.

Although the grammatical and pragmatic constraints that govern the expression or omission of arguments are not the same in all languages, there are certain themes that recur across languages and language families. For example, infinitives tend not to require overt subjects cross-linguistically. Also, many languages have relation-changing mechanisms (e.g., passives) that suppress arguments. In addition, the discourse requirements that govern argument expression are similar across languages. If a language allows null arguments only in specific discourse conditions, those conditions will (we assume) be similar to the conditions reviewed in the discourse pro-drop section (section 2.2). It seems unlikely that a language would allow or require argument omission when the referent is crucial to the understanding of the discourse and not recoverable by the context.[13]

As noted at the beginning of this paper, obligatoriness is often cited as a criterion or test for argumenthood. Given how easy it is to identify counterexamples to this criterion, it might seem surprising that linguists (students, teachers, scholars) still find it useful. We maintain that the obligatoriness criterion is useful and that exceptions can be systematically accounted for, as the literature summarized here has shown.

In light of these considerations, we conclude that the counterexamples to the obligatoriness criterion do not undermine the validity of the argument-adjunct distinction.

Acknowledgements

We have benefited immensely from feedback from Raj Singh, David Basilico, Mary Dalrymple, Ray Jackendoff, Beth Levin, Ashley Promislow, Lara Russo, Rob Truswell, members of the Carleton University Linguistics Reading Group, and two anonymous reviewers.

[13] See Goldberg 2006, Ch. 9 for further discussion of the constraint of recoverability.

References

Adger, David. 2003. *Core syntax: A Minimalist Approach*. Oxford: Oxford University Press.

Alonso-Ovalle, Luis, Charles Clifton, Susana Fernández-Solera, and Lyn Frazier. 2002. Null vs. overt pronouns and the topic-focus articulation in Spanish. *Journal of Italian Linguistics* 14(2): 151–169.

Ariel, Mira. 1988. Referring and accessibility. *Journal of Linguistics* 24: 65–87.

—. 1990. *Accessing noun-phrase antecedents*. London: Routledge.

Arka, I Wayan. 2014. Locative-related roles and the argument-adjunct distinction in Balinese. *Linguistic Discovery* 12(2): 56–84.

Asudeh, Ash, Gianluca Giorgolo, and Ida Toivonen. 2014. Meaning and valency. In Miriam Butt and Tracy Holloway King, eds., *Proceedings of the LFG14 Conference*, 66–88. Stanford, CA: CSLI Publications.

Barbosa, Pilar P. 2011. Pro-drop and theories of *pro* in the Minimalist Program, Part I: Consistent null subject languages and the Pronominal-Agr Hypothesis. *Language and Linguistics Compass* 5(8): 551–570.

Bayram, Faith. 2013. The acquisition of Turkish by heritage speakers: A processability approach. Ph.D. thesis, Newcastle University.

Bhatt, Rajesh, and Roumyana Pancheva. 2006. Implicit Arguments. In M. Everaert and H. C. Riemsdijk, eds., *The Blackwell Companion to Syntax, vol. 2*, 558–588. Oxford: Blackwell.

Bierwisch, Manfred. 2003. Heads, Complements, Adjuncts: Projections and Saturation. In E. Lang, C. Maienborn, and C. Fabricius-Hansen, eds., *Modifying Adjuncts*, 113–159. Berlin: Mouton de Gruyter.

Bresnan, Joan. 1982a. Control and complementation. *Linguistic Inquiry* 13: 343–434. Reprinted in Bresnan (1982b).

Bresnan, Joan, ed. 1982b. *The Mental Representation of Grammatical Relations*. Cambridge, MA: MIT Press.

Bresnan, Joan. 2001. *Lexical-Functional Syntax*. Oxford, UK: Blackwell Publishers.

Bresnan, Joan, Ash Asudeh, Ida Toivonen, and Stephen Wechsler. 2016. *Lexical-Functional Syntax, Second edition*. Hoboken, NJ: Wiley-Blackwell.

Bresnan, Joan, and Sam Mchombo. 1987. Topic, pronoun, and agreement in Chicheŵa. *Language* 63(4): 741–782.

Bruening, Benjamin. 2021. Implicit arguments in English double object constructions. *Natural Language and Linguistic Theory* 39: 1023–1085.

Brunetti, Lisa, Kordula De Kuthy, and Arndt Riester. 2021. The information-structural status of adjuncts: A Question-Under-Discussion-based approach. *Discours* 28: 3–48.

Burzio, Luigi. 1986. *Italian Syntax: A Government-Binding Approach*. Kluwer.

Carnie, Andrew. 2007. *Syntax: A Generative Introduction (second edition)*. Oxford: Wiley-Blackwell.

Chametzky, Robert. 2000. *Phrase Structure: From GB to Minimalism*. Oxford, UK: Blackwell Publishers.

Cheng, Yi-Yang. 2023. Tense-aspect conditioned agent marking in Kanakanavu, an Austronesian language of Taiwan. *Open Linguistics* 9(1): 20220234.

Chomsky, Noam. 1981. *Lectures on Government and Binding*. Dordrecht: Foris Publications.

Condoravdi, Cleo, and Jean Mark Gawron. 1996. The Context Dependency of Implicit Arguments. In Makoto Kanazawa, Christopher Piñón, and Henriëtte de Swart, eds., *Quantifiers, Deduction, and Context*. Stanford: CSLI.

Dahlstrom, Amy. 1991. *Plains Cree Morphosyntax*. New York: Garland Publications.

Dalrymple, Mary. 2001. *Lexical Functional Grammar. Syntax and Semantics 34*. New York: Academic Press.

David, Oana. 2016. Metaphor in the Grammar of Argument Realization. Ph.D. thesis, University of California, Berkeley.

Devos, Maud, and Rozenn Guérois. 2022. Micro-variation in object marking in North Mozambican Bantu languages. In Andrew Nevins, Anita Peti-Stantić, Mark de Vos, and Jana Willer-Gold, eds., *Angles of Object Agreement*, 138–168. Oxford: Oxford University Press.

Dione, Cheik Bamba. 2013. Valency change and complex predicates in Wolof: An LFG account. In Miriam Butt and Tracy Holloway King, eds., *Proceedings of the LFG13 Conference*, 232–252. Stanford: CSLI.

Drapeau, Lynne. 2011. A generalized applicative in Innu. In J. Randolph Valentine and Monica Macaulay, eds., *Papers of the 43rd Algonquian Conference*, 58–71. University of Wisconsin, Madison.

Du Bois, John W. 1987. The discourse basis of ergativity. *Language* 63(4): 805–855.

Ernst, Thomas. 2002. *The Syntax of Adjuncts*, vol. 96 of *Cambridge Studies in Linguistics*. Cambridge: Cambridge University Press.

—. 2020. The syntax of adverbials. *Annual Review of Linguistics* 89–109.

Everdell, Michael. 2023. Arguments and Adjuncts in O'dam: Language-Specific Realization of a Cross-Linguistic Distinction. Ph.D. thesis, University of Texas, Austin.

Farr, Cynthia, Bomi Terrence Furoke, and James Buyers Farr. 2006. Tafota Baruga Grammar Notes.

Fillmore, Charles J. 1986. Pragmatically controlled zero anaphora. In *Annual Meeting of the Berkeley Linguistics Society*, vol. 12, 95–107.

Findlay, Jamie Y. 2016. The prepositional passive in Lexical Functional Grammar. In Doug Arnold, Miriam Butt, Berthold Crysmann, Tracy Holloway King, and Stefan Stefan Müller, eds., *Proceedings of the Joint 2016 Conference on Head-driven Phrase Structure Grammar and Lexical Functional Grammar*, 255–275. Stanford: CSLI.

Glass, Lelia. 2021. English verbs can omit their objects when they describe routines. *English Language and Linguistics* 26(1): 49–73.

Goldberg, Adele. 2001. Patient arguments of causative verbs can be omitted: the role of information structure in argument distribution. *Language Sciences* 23: 503–524.

—. 2006. *Constructions at Work: The Nature of Generalization in Language*. Oxford: Oxford University Press.

Goldberg, Adele, and Farrell Ackerman. 2001. The pragmatics of obligatory adjuncts. *Language* 77(4): 798–814.

Grimshaw, Jane, and Sten Vikner. 1993. Dependent indefinites. In Eric Reuland and Werner Abraham, eds., *Knowledge and Language, Volume II: Lexical and Conceptual Structure*, 143–155. Dordrecht: Kluwer Academic Publishers.

Grosz, Barbara, Scott Weinstein, and Aravind Joshi. 1995. Centering: A Framework for Modeling the Local Coherence of Discourse. *Computational Linguistics* 21(2): 203–225.

Gundel, Jeanette, Nancy Hedberg, and Ron Zacharski. 1993. Cognitive Status and the Form of Referring Expressions in Discourse. *Language* 69(2): 274–307.

Haegeman, Liliane. 1990. Understood subjects in English diaries. *Multilingua* 9(2): 157–199.

—. 2017. Unspeakable sentences. Subject omission in written registers: a cartographic analysis. *Linguistic Variation* 17(2): 229–250.

Holmberg, Anders. 2010. Null subject parameters. In Theresa Biberauer, Anders Holmberg, Ian Roberts, and Sheehan M, eds., *Parametric Variation: Null Subjects in Minimalist Theory*, 88–124. Cambridge: Cambridge University Press.

Hualde, José Ignacio. 1989. Double object constructions in KiRimi. In Paul Newman and Robert Botne, eds., *Current Approaches to African Linguistics 5*, 179–190. Dordrecht: Foris.

Huang, C.-T. J. 1984. On the distribution and reference of empty pronominals. *Linguistic Inquiry* 15: 531–574.

Jackendoff, Ray. 1990. *Semantic Structures*. Cambridge, MA: MIT Press.

—. 2002. *Foundations of Language*. Cambridge, MA: MIT Press.

Jake, Janice. 1985. *Grammatical Relations in Imbabura Quechua*. New York: Garland.

Jung, E. H. 2004. Topic and subject prominence in interlanguage development. *Language Learning* 54(4): 713–738.

Junker, Marie-Odile, and Ida Toivonen. 2015. East Cree ghost participants. In Miriam Butt and Tracy Holloway King, eds., *Proceedings of the LFG15 Conference*, 125–144. Stanford, CA: CSLI Publications.

Kameyama, M. 1985. Zero anaphora: the case of Japanese. Ph.D. thesis, Stanford University.

Kibort, Anna. 2006. On three types of subjectlessness and how to model them in LFG. In Miriam Butt and Tracy Holloway King, eds., *Proceedings of the LFG06 Conference*, On–line proceedings. Stanford, CA: CSLI Publications.

Kiparsky, Paul. 1997. Remarks on denominal verbs. In Alex Alsina, Joan Bresnan, and Peter Sells, eds., *Complex Predicates*, 473–499. Stanford: CSLI Publications.

Lahaussois, Aimée. 2016. Reflexive derivations in Thulung. *Linguistics of the Tibeto-Burman area* 39: 49–66.

Levin, Beth. 1993. *English Verb Classes and Alternations: A Preliminary Investigation*. Chicago: University of Chicago Press.

Lyons, John. 1968. *Introduction to Theoretical Linguistics*. Cambridge: Cambridge University Press.

McInnerney, Andrew. 2022a. Against the argument/adjunct distinction. *University of Pennsylvania Working Papers in Linguistics* 28: Article 13.

—. 2022b. The Argument/Adjunct Distinction and the Structure of Prepositional Phrases. Ph.D. thesis, University of Michigan.

—. 2023. The argument/adjunct distinction does not condition islandhood of PPs in English. *Linguistic Inquiry* Advanced publication: 1–13.

Melchin, Paul. 2018. The Semantic Basis for Selectional Restrictions. Ph.D. thesis, University of Ottawa.

Mithun, Marianne. 2001. Understanding and explaining applicatives. In Mary Andronis, Chris Ball, Heidi Elston, and Sylvain Neuvel, eds., *CLS 37*, 73–98. Chicago, IL: Chicago Linguistic Society.

Mittwoch, Anita. 2005. Unspecified arguments in episodic and habitual sentences. In Nomi Erteschik-Shir and Tova Rapoport, eds., *The Syntax of Aspect: Deriving Thematic and Aspectual Interpretation*, 237–254. Oxford: Oxford University Press.

Napoli, Donna Jo. 1982. Initial material deletion in English. *Glossa* 16(1): 85–111.

Neeleman, Ad, and Kriszta Szendröi. 2007. Radical pro drop and the morphology of pronouns. *Lingusitic Inquiry* 38(4): 671–714.

Nikolaeva, Irina. 1999. Object agreement, grammatical relations, and information structure. *Studies in Language* 23(2): 331–376.

Paul, Ileana, and Diane Massam. 2021. Licensing null arguments in recipes across languages. *Journal of Linguistics* 57: 815–839.

Pereira, Ernei Ribeiro. 2021. On the relationship between null subjects and agreement: A large-scale cross-linguistic account. *Linguistic Discovery* 17(1): 47–62.

Pfau, Roland, and Helen Bos. 2016. Syntax: simple sentences. In Anne Baker, Beppie van den Bogaerde, Roland Pfau, and Trude Schermer, eds., *The Linguistics of Sign Languages: An Introduction*, 117–147. Amsterdam: John Benjamins Publishing Company.

Pierrehumbert, Janet, and Julia Hirschberg. 1990. The meaning of intonational contours in the interpretation of discourse. In Philip Cohen, Jerry Morgan, and Martha Pollack, eds., *Intentions in Communication*, chap. 14, 271–311. Cambridge: MIT Press.

Prince, Ellen. 1981. Toward a taxonomy of given–new information. In Peter Cole, ed., *Radical Pragmatics*, 223–255. New York: Academic Press.

Przepiórkowski, Adam. 2016. How *not* to distinguish arguments from adjuncts in LFG. In Doug Arnold, Miriam Butt, Berthold Crysmann, Tracy Holloway King, and Stefan Stefan Müller, eds., *Proceedings of the Joint 2016 Conference on Head-driven Phrase Structure Grammar and Lexical Functional Grammar*, 560–580. Stanford: CSLI.

Ramm, Wiebke. 2005. Discourse-structural salience from a cross-linguistic perspective: Coordination and its contribution to discourse (structure). In Christian Chiarcos, Berry Claus, and Michael Grabski, eds., *Salience: Multidisciplinary Perspectives on Its Function in Discourse*, 143–172. Berlin/New York: De Gruyter.

Rappaport Hovav, Malka, and Beth Levin. 1998. Building verb meanings. In Miriam Butt and Wilhelm Geuder, eds., *The Projection of Arguments: Lexical and Compositional Factors*, 97–134. Stanford: CSLI.

—. 2010. Reflections on manner/result complementarity. In Malka Rappaport Hovav, Edit Doron, and Ivy Sichel, eds., *Lexical Semantics, Syntax and Event Structure*, 21–38. Oxford: Oxford University Press.

Resnik, Philip. 1996. Selectional constraints: an information-theoretic model and its computational realization. *Cognition* 61(1–2): 127–159.

Rosén, Victoria. 1998. Topics and empty pronouns in Vietnamese. Ph.D. thesis, University of Bergen, Bergen.

Sadler, Louisa. 1997. Clitics and the structure-function mapping. In Miriam Butt and Tracy Holloway King, eds., *Proceedings of the LFG97 Conference*, On–line proceedings. Stanford, CA: CSLI Publications.

Scott, Katherine J. 2010. The relevance of referring expressions: the case of diary drop in English. Ph.D. thesis, University College London, London.

Somers, Harold L. 1984. On the validity of the complement-adjunct distinction in valency grammar. *Linguistics* 22(4): 507–530.

Sperber, Dan, and Deirdre Wilson. 1986. *Relevance: Communication and Cognition*. Oxford: Blackwell.

Stalnaker, Robert. 1998. On the Representation of Context. *Journal of Logic, Language and Information* 7(2): 3–19.

Tallerman, Maggie. 2005. *Understanding Syntax, 2nd ed*. London: Hodder Arnold.

Tao, Hongyin, and Sandra A. Thompson. 1994. The discourse and grammar interface: Preferred clause structure in Mandarin conversation. *Journal of Chinese Language Teachers' Association* 29: 1–34.

Thrasher, Randolph H. 1974. Shouldn't ignore these strings: A study of conversational deletion. Ph.D. thesis, University of Michigan, Ann Arbor.

Toivonen, Ida. 2023. Pronoun incorporation. In Mary Dalrymple, ed., *The Handbook of Lexical Functional Grammar*, 563–601. Language Science Press.

van den Heuvel, Wilco. 2016. *Aghu: Annotated texts with grammatical introduction and vocabulary lists*. Canberra: Australian National University. Based on Drabbe's (1957) *Spraakkunst van het Aghu-dialect van de Awjutaal*.

Wechsler, Stephen. 2015. *Word Meaning and Syntax: Approaches to the Interface*. Oxford: Oxford University Press.

Weir, Andrew. 2012. Left edge deletion in English and subject omission in diaries. *English Language and Linguistics* 16(1): 105–129.

Willgohs, Beatriz, and Patrick Farrell. 2009. Case and grammatical functions in Imbabura Quechua: An LFG approach. In Miriam Butt and Tracy Holloway King, eds., *Proceedings of the LFG'09 Conference*, 623–643. Stanford, CA: CSLI Publications.

Williams, Alexander. 2015. *Arguments in Syntax and Semantics*. Cambridge: Cambridge University Press.

Wood, Jim, and Raffaela Zanuttini. 2018. Datives, data and dialect syntax in American English. *Glossa* 2(1): 87, 1–22.