

Some structural disanalogies between pronouns and tenses

BRONWYN M. BJORKMAN 

Queen's University, Kingston, Ontario, Canada

bronwyn.bjorkman@queensu.ca

Abstract

A pronominal analysis of tense goes back to Partee (1973), motivated by a series of proposed parallels between the interpretation of tenses and that of pronouns. This article revisits Partee's interpretive parallels, as well as two more identified in Kratzer (1998), in light of subsequent developments in work on both temporal relations and on pronouns. The goal of this article is not to argue for or against a pronominal analysis of tense, but instead to make clearer the syntactic and semantic space within which such an analysis is situated, especially given that pronouns have been given increasingly complex syntactic representations even as tense has remained syntactically simplex.

Keywords: tense, pronouns, temporal semantics, syntax–semantics interface

Résumé

Une analyse pronominale du temps remonte à Partee (1973), motivée par une série de parallèles proposés entre l'interprétation des temps et celle des pronoms. Cet article passe en revue les parallèles interprétatifs de Partee, ainsi que deux autres identifiés par Kratzer (1998), à la lumière de certains développements ultérieurs dans la recherche sur les relations temporelles et sur les pronoms. L'objectif de cet article n'est d'argumenter pour ni contre une analyse pronominale du temps, mais plutôt d'élucider l'espace syntaxique et sémantique dans lequel se situe une telle analyse, d'autant plus que les pronoms se sont vu accorder des représentations syntaxiques de plus en plus complexes, alors que le temps reste syntaxiquement simplexe.

Mots-clés: temps, pronoms, sémantique temporelle, interface syntaxe–sémantique

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1. INTRODUCTION

One of the most influential proposals in temporal semantics has been that tenses are structurally or interpretively similar to pronouns. On this view, both tenses and pronouns involve a variable whose reference is determined either by semantic binding or by a contextually supplied assignment function; they differ primarily in their semantic type, the variable ranging over either individuals (pronouns) or times (tenses).

This proposal goes back to Partee (1973), who motivated the pronominal analysis of tense via a series of interpretive parallels between tenses and pronouns, arguing that tenses, like pronouns, can have their reference determined contextually or deictically, can corefer with other elements of the same type, and can be bound by an antecedent or a quantifier.

While the pronominal approach to tense remains influential in semantics, pronouns and tenses have received increasingly different syntactic analyses. In contemporary generative syntax, tense is treated as representationally simplex, encoded via a syntactic head T or Infl. By contrast, much recent work has argued that pronouns are (at least potentially) syntactically complex, with a semantic interpretation composed from more than a single atomic variable over individuals; see Déchaine and Wiltschko (2002) for a notable syntactic decomposition, and Elbourne (2005) for a semantic approach to pronouns based on internal complex structure.

Against this backdrop, this article revisits Partee's interpretive parallels, and two more identified in Kratzer (1998), and asks to what extent the proposed similarities between pronouns and tenses require parallel analyses, and to what extent they can be attributed to independent factors.

Section 2 begins by giving an overview of mainstream analyses of pronouns in contemporary syntax and semantics, and comparing the structures assumed for pronouns with those assumed for tenses. The main conclusion of this section is that though pronouns and tenses had quite similar structural analyses at some earlier points in generative syntactic theory, most current analyses treat them quite differently.

In light of the structural differences reviewed in section 2, section 3 reviews the analogies between pronouns and tenses identified by Partee (1973) and Kratzer (1998), evaluating to what extent they require a pronominal analysis of tense. In most cases, we find that the original analogies can be explained in other terms, or attributed to other properties of key examples (for example, effects of temporal interpretation that arise from viewpoint aspect or from the effects of coordination).

Section 4 concludes by discussing two broader questions. First, what are the theoretical implications – both in syntactic theory and in semantics – of a non-pronominal model of tense? And second, is this the kind of point on which we might expect languages to vary, and what would the implications for crosslinguistic variation in this domain be?

The goal of this article is not to argue conclusively against a pronominal analysis of tense. Rather, its goal is to situate proposed semantic analogies between pronouns and tenses in the context of current morphosyntactic views of both, as well as to consider whether the analogies first offered to motivate such a comparison remain persuasive in light of several decades of subsequent work on the semantics not only of tense, but also of related categories such as aspect and modality.

2. PRONOUNS IN CONTEMPORARY SYNTAX AND SEMANTICS

What does it mean to analyze tense as pronominal? This question has potentially different answers depending on whether we approach it from the perspective of semantics or syntax.

In formal semantics, *pronoun* is often treated as synonymous with *variable*, where a variable has its interpretation determined either by an assignment function or by binding. Prototypical nominal pronouns would be variables over individuals (of type *e*); a temporal pronoun would be a variable over times or intervals (usually abbreviated as type *t*). If tense is semantically pronominal, then its compositional role is to saturate the open time argument of the predicate with which it composes.¹ This semantic view of pronouns—both individual and temporal—underlies the discussions in both Partee (1973) and Kratzer (1998).

In syntax, by contrast, *pronoun* has a less clear definition, but is perhaps best characterized as a nominal without specific lexical or root content, whose properties can be described entirely in terms of formal features such as person, number, gender, or case. Syntactic definitions of pronouns may further specify that a pronoun is an element whose distribution conforms to something like Principle B, though this excludes not only anaphors but also some or all non-reflexive pronouns in some languages (Cardinaletti and Starke 1994, Déchaine and Wiltschko 2002).

Though both semantic and syntactic definitions of what it is to be a pronoun originate from efforts to characterize a class that includes nominal pronouns of the type found in English and other languages, the definitions need not pick out the same set of elements – it could be that tense is best analyzed as a variable over times (i.e., a semantic pronoun), while having a very different syntactic representation from any nominal pronoun. Yet through the 90s the structural analyses of tenses and pronouns went through a period of convergence. Going back at least to Postal (1966), pronouns have commonly been analyzed as belonging to the same category as determiners, and with the advent of Abney's (1987) highly influential argument for a parallel between nominal and clausal structures, wherein nominal projections are headed by D just as clauses are headed by T (or Infl), pronouns and tenses could be seen as occupying the same structural role in different functional sequences. From a different direction, Enç (1987) argued that if tenses are like pronouns, then they should likewise be subject to the syntactic principle of Binding Theory, and on that basis developed an analysis of the interpretation of tense in embedded clauses that proceeds from the assumption that tense can be either reflexive or anaphoric (subject to either Principle A or B).

In the following decades, however, the syntactic (and related semantic) analysis of pronouns has grown considerably more complex, with a variety of proposals that pronouns are not heads but instead correspond to complex syntactic structures. An influential example can be found in Déchaine and Wiltschko (2002), who proposed a typology of pronouns that includes (at a minimum) pronouns corresponding to a full

¹The main alternative to a pronominal analysis of tense is the quantificational or existential analysis. See Ogihara and Kusumoto (2021) and Aonuki (2021) for recent overviews of the debate between pronominal and existential analyses.

DP structure as in (1a), ones corresponding to an intermediate Φ P structure as in (1b), and ones corresponding to a simple NP.² A similar typology was proposed by Conrod (2019), though with a difference not in the size of the DP structure but instead in how high the lowest N head moves prior to its morphological realization, with consequences for the semantic type and interpretation of pronominal elements. As noted in the introduction, Elbourne (2005) is a well-known semantic proposal that pronouns should be decomposed into a determiner with a null nominal complement; see also the more recent discussion in Patel-Grosz and Grosz (2017) of whether some or all pronouns have internal structure, taking a primarily semantic perspective.

(1) Déchaine and Wiltschko (2002): Three types of pronouns

- a. [_{DP} D [_{Φ P} Φ [_{NP} N]]] (referential pronouns)
- b. [_{Φ P} Φ [_{NP} N]] (variable pronouns)
- c. [_{NP} N] (predicative pronouns)

For Déchaine and Wiltschko, DP pronouns are (potentially) morphologically complex, occur only in argument positions, are subject to Principle C of the binding theory, and are canonically semantically definite. The last three properties are specific contributions of the D head: Déchaine and Wiltschko adopt the position that DPs occur only as arguments, and attribute to D the semantics of definiteness and determining reference, which in turn make DP pronouns act as R-expressions for the purposes of binding. Examples of DP pronouns in this analysis are those in Stó:lō Halq'eméylem (also known as Upriver Halkomelem), and participant pronouns in English (those that can precede a noun, as in *we linguists*).

By contrast, NP pronouns contain no head other than N, which is semantically predicative, and so can appear only in predicative positions, and do not participate in binding relations. The example Déchaine and Wiltschko discuss is Japanese *kare*.

Φ P pronouns involve less structure than a full DP but more than a simple N, and so show mixed or intermediate properties – in Déchaine and Wiltschko (2002) this could involve a number of distinct functional heads, and potentially different “sizes” of pronouns in different languages. Like DP pronouns, Φ P pronouns are (potentially) morphologically complex, but unlike DP pronouns they can occur in either argument or predicate positions, are not definite, are subject to Principle B of the binding theory, and can act as bound variables. Déchaine and Wiltschko analyzed pronouns in Secwepemctsin (also known as Shuswap) and third-person pronouns in English as Φ P pronouns.

This move of analyzing pronouns as corresponding to an underlyingly complex syntax has been enabled by the wider adoption of realizational approaches to morphology, wherein morphological forms are not the input to syntax but instead reflect a best effort to realize the output of syntax with the language’s morphological

²Though pronouns contain an NP for Déchaine and Wiltschko (2002), this N does not contribute lexical content beyond category. In the terminology of Distributed Morphology, their analysis could be restated as saying that pronouns contain a categorizing little-*n* head, but no root element.

resources. So while for both Déchaine and Wiltschko (2002) and Conrod (2019), at least some of the structures realized by pronouns are interpreted as (free or bound) variables, there is not necessarily any “lexical item” – potentially no single head or feature in the syntax – that is exclusively interpreted as a variable, though a variable may be part of the semantic interpretation of a head or (for Conrod) the interpretive result of DP-internal movement.

In contrast to pronouns, the representation of tense has by and large remained atomic. Versions of the Split-Infl hypothesis which distribute parts of the meanings associated with “simple tenses” across projections such as FinP (finiteness), TP (tense), and AspP (aspect), might appear to provide a parallel to the increasingly complex structures assumed to underly pronouns. What is distributed across multiple projections in the clausal domain, however, is temporal interpretation in general, which involves not a single time or interval but instead (on most contemporary approaches) at least three times: the time at which the event takes place, the time at which the clause is evaluated (usually the utterance time), and a topic or reference time that mediates between the first two (Reichenbach 1947, Klein 1994). A pronominal tense would refer to the third of these, the topic or reference time, saturating a predicate of times created by viewpoint aspect (which in turn quantifies over the time of the predicate’s event). This is different from nominal pronouns, where it is the DP as a whole that refers to a (potentially plural) entity. So while both clauses and nominals are widely assumed to involve a complex functional hierarchy, there is not a clear parallel between tense itself and structurally complex pronouns.

More strikingly, tenses are unlike pronouns in that they are functional elements that almost always occur in a functional sequence above an overt lexical predicate within the same clause – either a verb phrase or a non-verbal predicate. The exception is clauses with VP ellipsis, in languages that allow such ellipsis, but even in such cases the elided material has been argued to be syntactically and semantically present, though not overtly realized (see Merchant 2019 for a survey of arguments in favour of a PF-deletion approach to ellipsis) – the exception being *we linguist*-type constructions noted above. Even if pronouns are treated as semantically involving a null nominal complement, as in Elbourne (2005), we see almost complementary behaviour in the surface distribution of tenses and pronouns in terms of the overtness of their complement.

From the perspective of contemporary morphosyntax, then, the parallel is not so much between pronouns and tenses, as between pronouns and the complete functional sequence of a clause, within which tense occupies a single syntactic head.

These changes in the way we think about pronouns and tenses in syntax make them look quite different from one another, and more syntactically different than they may have appeared in previous periods of generative linguistic theory. It is therefore worth returning to the semantic parallels identified by Partee (1973) and Kratzer (1998) and assessing whether they have also become less compelling in view of subsequent theoretical developments.

If the semantic parallels remain compelling, this raises interesting questions for the mapping from structure to interpretation; given the assumption that semantics, like morphology, interprets the output of syntax, then it is of interest if very different

syntactic structures give rise to fundamentally similar interpretations. And whether or not the parallels remain compelling, it is entirely possible that despite their structural differences, both tenses and pronouns realize structures whose interpretation involves a semantic variable, whether free or bound, even if that variable does not correspond directly to either the whole structure or to any specific functional head³ – but equally, that subtle differences in their interpretation, within single utterances or in discourse, are relevant for evaluating how close a semantic parallel it is useful to draw.

3. PROPOSED ANALOGIES BETWEEN PRONOUNS AND TENSES

As noted in the introduction, the pronominal theory of tense originated with Partee (1973), who identified four analogies between pronouns and tenses, and a fifth “shared non-property”:

- (i) Tenses, like pronouns, can refer
- (ii) Tenses, like pronouns, can be anaphoric
- (iii) Tenses, like pronouns, can act as bound variables
- (iv) Tenses, like pronouns, can interact scopally with quantifiers
- (v) Both tenses and pronouns are distinct from “nonpronominal term phrases”

Kratzer (1998) identified two further analogies:

- (i) Tense features, like Φ -features on pronouns, can be semantically uninterpreted.
- (ii) Tense in German, like pronouns, is infelicitous without a clear discourse antecedent

The remainder of this section briefly reviews each of these analogies in turn, first summarizing its original presentation, and then discussing it in the context of subsequent developments in the analysis of tense and related categories.

3.1 Tense as Referential

Partee (1973) observed that just as pronouns are often used deictically, referring to a person or object determined by the context of utterance as in (2), tenses appear to have similarly referential uses, as in (3):

- (2) He shouldn't be in here. (Partee 1973: 602)
- (3) I didn't turn off the stove. (Partee 1973: 602)

Partee's comparison between pronouns and tenses was framed in opposition to the analysis of tense as a sentential operator, as in Prior (1967); the main point is that sentences like (3) do not have the meaning we might expect, if tense is an existential operator that takes scope with respect to a sentential operator like negation, as

³Chapter 1 of Kusumoto (1999) provides an overview of the debate over whether there is explicit quantification over times in natural language (and thus variables over times / intervals); for a more recent discussion, see also Aonuki (2021). If tenses are pronouns then natural language must include time variables, but the converse is not true – there can be time variables in natural language even if tenses are never pronouns.

proposed by Prior. Example (3) means neither that there exists a past time at which I did not turn off the stove (PAST>NEG), nor that it is not the case that there is any past time at which I have turned off the stove (NEG>PAST). Instead, a sentence like (3) appears to assert that I failed to turn off the stove at some contextually-relevant past time, much as the subject in (2) is some contextually-relevant male individual.

While Partee suggested that the past tense refers to a contextually relevant time, just as third-person pronouns refer to a contextually relevant individual,⁴ she suggested that the present tense is instead *indexical*, as first and second person pronouns are.

(4) I am here (now).

In (4), *I* and *here* refer necessarily to the speaker and location of the utterance. Similarly, both the present tense and the adverbial *now* refer necessarily to the time at which it was uttered (or written).

Examples like (3) seem to clearly show that context plays a role in identifying the topic time of a clause – though Kratzer (1998) later noted that the English past tense does not need a *specific* past moment or interval to be made salient by the preceding discourse, whereas third person referential pronouns do, as discussed further in section 3.6 below.

The question, though, is whether this means that tense refers to times in the same way that pronouns refer to individuals. Consider the range of examples in (5); ((5a) repeated from (2)):

- (5) a. He shouldn't be in here.
 b. The dog shouldn't be in here.
 c. The last person to arrive shouldn't be in here.
 d. I just saw someone who shouldn't be in here.

Though the subjects in (5) are all potentially referential, and pick out a specific individual relative to a given context, they do so in different ways. A speaker might use a definite expression like *the last person to arrive* even if they are unsure which specific individual it describes; conversely, the expression *someone who shouldn't be in here* can be used to reference a specific salient individual, though it is semantically indefinite. Similarly, the contextually salient time picked out in (3) could be supplied in several different ways, not all of which require that a syntactic tense head or feature be directly interpreted as a variable referring to a time or interval. Both Ogihara (1989) and Kusumoto (1999) argue that contextual restriction on the domain of

⁴Partee (1973: 603) observed that the past tense is often “vague” in its reference, and compared it to a nonspecific use of *they*. “These are not picking out particular referents in the way we generally think of deictics doing; but they are certainly not generic or anaphoric either. ‘They’ in [*They haven't installed my telephone yet.*] seems to be referring to whoever it is that's supposed to install the telephone, and *Past* in [*John went to a private school.*] seems to refer to whenever it was that John went to school.” This might be the first reference to non-specific *they* in the generative literature – though perhaps not to singular *they*, as it is not perfectly clear that Partee has in mind a singular interpretation for *they*.

quantification can account for the interpretation of tense in examples like (3), even if tense introduces a time via existential quantification rather than referentially as a pronoun.

3.2 Tense as Anaphoric

Nominal pronouns can be anaphoric rather than deictic, when they co-refer with a linguistic antecedent. For example, in (6), the pronoun *it* in the second clause corefers with the *the car* in the first clause.

(6) Sam took the car yesterday and Sheila took it today. (Partee 1973: 605)

Partee (1973: 605) suggested that in (7) the tense of the second clause refers to the same time as the tense in the first clause in a similar way.

- (7) a. Sheila had a party last Friday and Sam got drunk.
 b. When Susan walked in, Peter left.

In examples like (7b) it is not clear whether the best analysis is in terms of coreference or binding (on analogy, for instance, to free relatives), as Partee observed, but in (7a) there is no possibility of binding between the tenses of the two coordinated clauses, assuming that a head internal to one conjunct cannot c-command into the other.

However, the interpretation of the two clauses in (7a) as being simultaneous cannot be attributed just to coreference between their tenses (or more accurately to their topic times). We can see this by reversing the order of the two clauses, as in (8). If the temporal overlap were due to an anaphoric interpretation of tense in the second clause we would expect it to persist when the orders are reversed, but in fact (8) instead seems to suddenly require that the second clause temporally follow (or be caused by) the first.

(8) Sam got drunk last Friday and Sheila had a party.

Such temporal or causal sequencing is a general property of clausal and sub-clausal “asymmetric” coordination (Schmerling 1975, Bar Lev and Palacas 1980), and arises in embedded contexts only with the coordination of TPs, not CPs (Bjorkman 2013). This suggests that though the interpretive effect may be related to the syntactic accessibility of tense, it does not arise from a pronominal tense coreferring with other local tenses.⁵

Partee (1984) discussed the somewhat different example in (9) as an example of anaphoric tense; the past tense in the second clause refers to the topic time introduced by *sometime during the night*, an indefinite time description.

⁵The asymmetric relation between coordinated matrix clauses is compatible with the discourse-based update function for reference times proposed in Partee (1984). What is harder to explain in that framework is the difference between coordinated clauses and clauses simply occurring in sequence in a discourse; the latter allow for “reversed” temporal or causal relationships, while the former do not, as noted in Bar Lev and Palacas (1980). The reference time update approach also faces difficulty in dealing with the interpretation of coordinated embedded clauses of the type discussed by Bjorkman (2013).

(9) Mary woke up sometime during the night. She turned on the light.

(Partee 1984: 246)

What this example does not show, however, is direct coreference between temporal pronouns corresponding to the tenses in the two clauses, which we might expect if tenses can be anaphoric in the same way that pronouns can be. Indeed, Partee (1984) concluded that tenses do not refer to times in the same way that pronouns refer to individuals, in part because examples like (9) seem not to involve exactly the same time in each clause, but instead a sequence of two times, with the turning on of a light in the second sentence closely following the waking described in the first sentence.

The overall evidence for coreference between separate tenses is thus weak or inconclusive, and therefore does not strongly support the parallel with nominal pronouns.

3.3 Tense as a Bound Variable

Partee's final two analogies (iii, iv) involve examples where tense appears to occur as a bound variable. The third analogy involves tenses in main clauses; the fourth, to be discussed in section 3.4, involves potential bound variable tenses in embedded clauses.

First of all, in a sentence like (10), Partee (1973) noted (as remains standard) that *will* is a present tense modal, evaluated with reference to the present time.

(10) I will stop talking immediately.

But Partee observed that in a sentence like (11), the future meaning of *will* is not calculated from NOW, but instead from the time of the temporal adjunct:

(11) When my time is up, I will stop talking immediately.

Partee suggested that the most natural analysis of this pattern is that the present tense of *will* is bound by the time introduced by the temporal adjunct clause.

This interpretation depends less on the interaction of tense, however, than it does on the aspectual properties of the predicates in the two clauses; subsequence arises not from *will*, but from both clauses being perfective (i.e., neither stative nor imperfective/progressive).

When the main clause is progressive, as in (12), *will* is clearly no longer calculated forward from the time identified in the adjunct, but instead as ongoing with the *when* clause. In (12) we therefore would not want to allow the time from which *will* is calculated to be bound by the time of the temporal adjunct clause.

(12) When my time is up, I will (still) be speaking.

Indeed, a subsequence relation obtains between the two clauses so long as both are perfective, even in the simple past tense without any modal, as in (13). This shows that the temporal ordering in (11) need not be attributed to the time of evaluation for *will* being bound, but instead to independent factors governing the sequencing of perfective clauses.

(13) When my time was up, I gathered up my notes.

Partee (1984) revised the analysis of *when* clauses (as well as other temporal adjunct clauses), based on similar observations about the interaction of aspect with the availability of subsequence vs. simultaneous interpretations. Partee (1984) treated the interpretation of past tense clauses within Discourse Representation Theory (Kamp 1981; Heim 2002); in this later article, Partee proposed that event (i.e., perfective) clauses introduce a new reference time in the discourse, typically one that immediately follows their own reference time. In the examples above, the reference time is thus updated after the *when* clause is interpreted; perfective clauses are interpreted as taking place within the new reference time, while imperfective (or stative) clauses are interpreted as ongoing. Much subsequent work has been done on temporal sequencing in discourse within the framework of Segmented Discourse Representation Theory (SDRT), notably by Asher and Lascarides (1993, 2003) and Asher and Vieu (2005).

A discourse-based approach of this type can account for the non-simultaneity of perfective clauses with one another, but this is only one facet of the temporal interpretation of perfective clauses. Example (14), for instance, is a single clause in the present tense. It has an eventive predicate, so we might expect it to mean the same thing as *my colleague is smoking* – but it does not. Eventive predicates in the simple present tense in English can only be interpreted as habitual (or generic, with an appropriate subject).

(14) My colleague smokes.

Both (14) and the previous examples in this section illustrate what Cowper (1998) called the Principle of Non-Simultaneity of Points: just as two perfective clauses cannot be simultaneous with one another, a perfective clause cannot be interpreted as simultaneous with the present moment. For a recent detailed investigation of the incompatibility of the present tense and perfective aspect, see De Wit (2016).

This habitual interpretation is relevant to considering another type of example that Partee (1973) discussed as involving bound tenses in main clauses, sentences with temporal adverbials like *never* and *always*.

(15) My brother never answers when I call his phone.

(16) My least favourite professor always gave assignments that were due the next day.

These examples can be restated without the adverbs *always* or *never*, because simple tenses in English permit habitual interpretations:

(17) My brother doesn't answer when I call his phone.

(18) My least favourite professor gave assignments that were due the next day.

Habitual interpretations, whether from simple tenses or via adverbs of quantification, are most often treated as involving quantification not over times but over situations (Lawler 1973, Farkas and Sugioka 1983, among others). This complicates the issue of whether examples like (15) or (16) provide direct evidence for the binding of tense by temporal adverbials.

To summarize, tenses in main clauses are not unambiguously bound either by temporal adjunct clauses or by temporal adverbials.

3.4 Scope Interactions

Partee (1973) discussed potentially bound interpretations of tenses in embedded clauses separately from those in main clauses, as a fourth analogy which she described as showing scope interactions. The relevant relationship between tenses is perhaps most clearly visible in the ambiguity of examples like (19), where the arguably bound tense occurs within the relative clause *that he wants*.

(19) John will have everything that he wants. (Partee 1973: 608)

On one interpretation, the tense of *wants* is interpreted as the speaker's utterance time, that is, as an independent present tense. On the other interpretation, the present tense of *wants* is shifted forward to the same time at which *have* in the main clause is interpreted. This covariance could be modelled via binding or coreference between the time pronouns in the two clauses – though note that the present tense of *wants* cannot be bound by the main clause tense itself (because main clause tense provides the time of evaluation for the modal *will*); it would instead be bound by a time argument of *have*.⁶

As we saw in the case of potential tense coreference in section 3.2, however, the simultaneity of the two predicates in (19) is not due entirely to the tense of the two clauses, but also to the fact that both predicates are stative. If we replace both with eventive verbs, as in (20), the dependent reading of the relative clause tense is no longer simultaneous with the time of the matrix predicate.⁷

(20) John will research everything that he buys.

A natural reading of (20) is one where the times of buying and reading do covary, but even on this reading they never refer to precisely the same times or intervals – John may always first research something then buy it later, or buy things and then research them, but the buying and researching are not simultaneous. As Partee (1984) noted, this is quite different from bound variable pronouns, which never (for example) refer to the individual immediately to the right of their binder, or to the father of their binder.⁸

⁶Much work on embedded tense, including Ogihara (1989) and Kusumoto (1999), has treated the ambiguity of examples like (19) (and (20), below) not in terms of binding but in terms of a Sequence of Tense rule, which optionally applies at LF to delete embedded tenses when they occur under a matching main clause tense. Other current approaches to Sequence of Tense, such as that developed in von Stechow (2002), do depend on a binding relation between matrix and embedded tense, however, and the remainder of this section considers whether binding for embedded tenses could in principle be treated in the same terms as bound variable pronouns.

⁷The other reading of (20), where the tense of the relative clause is independent, is still present but somewhat less prominent, because of the restrictions on interpreting eventive verbs in the simple present tense. The independent reading can be brought out with additional modifiers, as in: *John will eventually research everything he buys this month, but not until next year*.

⁸Rather than analyzing the tense of relative clauses as bound, authors such as Ogihara (1989, 1995), Kusumoto (1999), and Stowell (2007b) have proposed that semantic tense is

The same can be said of the instances of embedded past tense that Partee (1973) suggested are bound, as in (21), but with added complexity arising from the counterfactual interpretation of past tense modals in English.

(21) If John had married Susan, he would have had everything he wanted.

(Partee 1973: 608)

As in (19), the time at which *wanted* is interpreted can either be the same as the time at which *had* in the *if*-clause is interpreted (both within the scope of the modal *would*), or some actual past time (e.g., *everything he wanted when he was younger*).

However, again unlike with potentially bound or free pronouns, the counterfactual interpretation of the past tense in the relative clause in (20) is not obviously coreferential with any time introduced in the main clause. This can be seen more clearly by once again considering only eventive predicates:

(22) If John had had any common sense, he would have researched everything he bought.

The past tense of *bought* can be interpreted either counterfactually (*everything he would have bought, but in fact he didn't buy anything*) or non-counterfactually (*everything he did in fact buy*). The first of these is the potentially bound tense – the latter can be simply an independent past tense.

Since Iatridou's (2000) analysis of how past tense contributes to counterfactual semantics in some languages, it has been a matter of debate in the semantic literature whether the morphological past tense used in some languages to mark counterfactual clauses is interpreted with its usual temporal semantics, or instead with a more abstract meaning of modal non-coincidence or remoteness.

If counterfactual past tense is not interpreted temporally – but instead as enforcing modal remoteness, as in Schulz (2014) – then examples like (22) would be irrelevant to the question of whether tense is pronominal, because they would lack genuine tense morphology.

Even if counterfactual past marking is semantically interpreted as a temporal past tense, however, the embedded tense on *bought* in (22) could not be bound by any of the time pronouns in the matrix clause. Ippolito (2013) and Arregui (2009) have both argued that counterfactual past tenses are still semantically temporal; Ippolito (2013), for example, has proposed that the past tense found in counterfactual conditionals shifts the time from which the accessibility relation of the modal is calculated. Because tense on *bought* is counterfactual, it cannot refer to the actual past time from which accessibility is calculated – and just as discussed above in connection to example (19), it also cannot refer to the same times (real or hypothetical) that *researched* is interpreted at, because the buying and the researching do not take place at exactly the same times.

In summary, just as discussed for main clause tense in section 3.3, and as observed already in Partee (1984), we find on closer examination that it is not the

(optionally) vacuous in relative clauses in English. In the detailed semantic analysis developed in Kusumoto (1999), however, note that though the semantic (existential) tense is vacuous, there is nonetheless a bound tense pronoun in the relative clause, corresponding not to semantic tense but to the tense morpheme of the embedded verb.

case that the tense of an embedded clause can be bound by main clause tense in the same way that pronouns can be bound by a higher variable.

3.5 The shared disanalogy

The last parallel between tenses and pronouns discussed in Partee (1973) is the ways in which both differ from what she called “full term phrases”. In the case of pronouns, these are full individual-denoting noun phrases. Partee identified time adverbials, such as *three weeks ago* in (23), as the temporal equivalent of these.

(23) We climbed Mt. Baker three weeks ago. (Partee 1973: 604)

She conceded that the analogy is not perfect, however, as time adverbials always co-occur with overt tenses, while full noun phrases do not co-occur with pronouns except in expressions such as *we the people*, or in left dislocations as in (24), at least in languages like English.

(24) The woman in the house next door, she almost ran over me. (Partee 1973: 604)

Partee mentioned that the situation may differ in other languages; while she did not mention any specific language, tenseless languages, such as Paraguayan Guaraní, (Tonhauer 2011) or languages with optional tense, such as Washo, (Bochnak 2017) might be described in these terms. In optional tense languages, in particular, time adverbials can occur without any overt tense morpheme – though Bochnak (2017) proposes that, at least in Washo, clauses with non-overt tense do contain semantic tense, which though null is interpreted as a time pronoun that can freely refer to past, present, or future times.

Unlike pronouns and full noun phrases, however, tenses and time descriptions do not share a syntactic distribution – even if the type of *sometime during the night* is a time or an interval, it has the syntactic distribution of a (potentially adverbial) noun phrase, related to a pronoun like *then* rather than to tense.

3.6 Uninterpreted tense and pronominal features

Kratzer (1998) extended Partee’s analogies between pronouns and tenses with two further parallels. The first of these involves bound variable uses of tenses and pronouns, and the question of whether their morphology is always semantically interpreted.

Heim (2008, and previous unpublished sources; see also Kratzer 2009) noted that certain bound variable pronouns appear to bear person, number, or gender features (φ -features) that are not interpreted:

(25) Only I did my homework.
Meaning 1: Nobody else did my homework.
Meaning 2: Nobody else did **their** homework.

Heim proposed that when *my* in (25) is interpreted as a bound variable (Meaning 2), it receives its Φ -features via a syntactic operation of Feature Transmission: these

features are supplied for the purposes of morphological realization, but are not present for the purposes of semantic interpretation at LF.

Kratzer (1998) suggested that embedded tense in Sequence of Tense contexts should be given the same analysis. As we have already seen, in Sequence of Tense languages like English, when a past tense is embedded under a higher past tense, as in (26), the two clauses can be interpreted as holding simultaneously –an interpretation that would be unexpected if the most deeply embedded past tense were a temporal operator that shifts the interpretation of its clause further back in time.

(26) They **said** that they **were** doing their homework.

This analysis, in which embedded past tense in Sequence of Tense languages can be licensed via Feature Transmission or a similar mechanism, has become a dominant view of Sequence of Tense in the semantic literature, developed for tense in perhaps the most syntactic detail by von Stechow (2002).⁹ If a mechanism like Feature Transmission is only available to pronoun-like syntactic objects, and it is the best available analysis of Sequence of Tense effects, this would be a strong argument in favour of a pronominal analysis of tense.

There are analyses of both embedded past in Sequence of Tense and of the features of bound variable pronouns, however, that argue that such features are not valued or licensed via a morphosyntactic dependency. Bjorkman (2018) has argued, for example, that whatever the semantics of Sequence of Tense, current theories of morphology and syntax make it difficult to analyze embedded tense features as licensed by those of the matrix clause, because such a licensing relationship is always non-local across a finite clause boundary, as in (27a), and in some cases would have to license instances of past tense that lack any syntactic licenser, as in (27b).¹⁰

(27) Context: *Kira was an odd child, with fixed opinions about her future. When she was six she decided that she would one day own a cat that looked like her. She's now changed her mind, but...*

- a. It is odd that Kira **wanted** to own a cat who **resembled** her.
- b. Kira's childhood desire to own a cat who **resembled** her remains odd.

On different grounds, some analyses of the interpretation of bound variable pronouns dispense with Feature Transmission. Sudo (2012), for example, treats the person features of pronouns not as indexical but as enforcing an admissibility condition on their referential index. A first person pronoun is admissible only if the assignment function associates its index with the author of the utterance; a second person pronoun is

⁹See Kratzer (2009) for a detailed discussion of Feature Transmission as a mechanism valuing the features of bound variable nominal pronouns.

¹⁰Ogihara (1989) assumes that in examples like (27b), the past tense in the relative clause is licensed by a past feature on the nominal head, in this case *desire*, though in addition to the lack of any morphological evidence for the presence of tense features on nouns in a language like English, work such as Musan (1995) casts doubt on the idea that the temporal interpretation of nominals should be understood in terms of tense *per se*.

admissible only if its index is associated with the audience; a third-person pronoun only if its index is associated with neither (Sudo 2012: 162). This condition extends to binding, so that only first person noun phrases can bind first person pronouns. Because this treats person features as non-presuppositional, they can be ignored when calculating focus alternatives in examples like (25), without any need for long-distance morphosyntactic mechanisms to license the features on the bound pronouns. This type of approach avoids the long-distance dependency required by Feature Transmission; if Feature Transmission is not needed to account for bound variable readings of first and second person pronouns, then it does not represent a parallel between pronouns and tenses.

Finally, even if there is one mechanism responsible for the morphology on both bound variable pronouns and embedded tense in Sequence of Tense interpretations, this parallel is limited to languages where both phenomena are attested. And while (arguably) uninterpreted features on bound variable pronouns do not seem to be typologically restricted, Sequence of Tense very much is, being found only in a subset of Indo-European languages, primarily Germanic and Romance (Bjorkman 2018). While there is nothing inconsistent in a feature licensing mechanism applying to one type of pronoun in a language but not others, the apparently systematic absence of Sequence of Tense effects outside Indo-European is mildly surprising if a) Sequence of Tense arises from Feature Transmission, b) Feature Transmission can license features on any bound pronoun, and c) tenses are semantically similar to pronouns.

Overall, however, Feature Transmission remains a widely adopted analysis both of the presence of person features on bound variable pronouns, and of Sequence of Tense effects, and to the extent that this approach remains successful it constitutes a notable parallel between the properties of pronouns and those of tenses.

3.7 Strictly pronominal tense in German

The second parallel presented in Kratzer (1998) arises in the interpretation of the simple past tense in German, but not in English. Building on Partee's first analogy – that tenses pick out a time made salient in context, much as pronouns pick out a salient individual – Kratzer first noted that the English past tense is in fact unlike pronouns in being possible even when the context does not provide a specific salient past time for it to refer to. If you are looking around churches in Italy, for example, the exchange in (28) is felicitous out of the blue, without any prior discourse.

(28) A: Who built this church?

B: Borromini built this church.

(Kratzer 1998: 106)

This is perhaps surprising, if the past tense in the utterances in (28) corresponds to a time pronoun, because this pronoun would be nonspecific. Compare the dialogue in (29), where the pronoun *he* is infelicitous out of the blue in both the question and the response:¹¹

¹¹Thank you to an anonymous reviewer for suggesting the analogy in (29).

- (29) A: #Who did he invite?
 B: #He invited Sue.

Interestingly, in Standard German the simple past tense, as in (30), is infelicitous in precisely this type of context. The morphological form that is required instead is the present perfect, as in (31).

- (30) *Wer baute diese Kirche? Borromini baute diese Kirche.
 Who built this church? Borromini built this church. (Kratzer 1998: 106)
- (31) Wer hat diese Kirche gebaut? Borromini hat diese Kirche gebaut.
 Who has this church built? Borromini has this church built. (Kratzer 1998: 106)

Kratzer argued that the infelicity of (30) in German can be understood if the simple past tense form corresponds to a true semantic past tense, which indeed involves definite time reference. The morphological present perfect, by contrast, instead introduces a past time via existential quantification; the clause does contain a temporal pronoun, but because it is in the present tense this pronoun refers to the time of utterance, which is always contextually salient.

As Kratzer pointed out, this weakens the parallel between tense and pronouns in English, where the past tense is in fact felicitous in out-of-the-blue contexts, though the parallel stands for languages like German.

Kratzer proposed that the English simple past is semantically (and presumably structurally) ambiguous between a true semantic past, and a semantic present perfect, where tense refers to the contextual NOW but composes with a back-shifting anterior aspect.¹²

Were we to adopt Kratzer's analysis of the English past tense, this would mean that pronominal tense in at least some languages can only be individuated semantically, because it would not be consistently associated with morphological or syntactic tense.¹³ The proposal that the English simple past is ambiguous is moreover made less compelling by the fact that English does also have a morphologically and semantically distinct present perfect. If we assume that a single semantic interpretation (present perfect) sometimes results from a morphosyntactic present perfect and sometimes from a morphosyntactic simple past, we seem to be faced with a very serious

¹²A similar proposal can be found in Stowell (2007a). Stowell argued that the English perfect is ambiguous, at least when non-finite, between a nonfinite perfect interpretation and a (morphologically) nonfinite past tense interpretation. If correct, this supports Kratzer's contention that a single morphosyntactic form can be semantically ambiguous between past and perfect interpretations.

¹³As pointed out by an anonymous reviewer, few researchers have adopted Kratzer's proposal that the English present tense is semantically a present perfect; the felicity of the simple past in out-of-the-blue contexts in English is more often attributed to the entirety of the past time being available as a contextually salient interval for tense to refer to (an option that must be ruled out for German). Another alternative is that the English past tense could be ambiguous between a pronominal and a quantificational interpretation.

learnability problem: how could a child learner come to distinguish the past tense from the present perfect if both morphological forms can receive either semantic interpretation?

Schaden (2009: 127) extended the contrast between English and German that Kratzer identified to two further languages, observing that Spanish is like English in allowing the simple perfective past in out-of-the-blue contexts, as in (32a), while French is like German in that the simple past is infelicitous in such contexts, as in (32b).

- (32) a. ¿Quién construyó esta iglesia? Borromini construyó esta iglesia.
 Who build.PAST.PFV this church B. build.PAST.PFV this church.
 'Who built this church? Borromini built this church.'
- b. #Qui construisit cette église? Borromini construisit cette église.
 'Who build.PAST.PFV this church B. build.PAST.PFV this church.'

According to Schaden, French and German are languages where the simple past is the “marked” way of describing past events, while in English and Spanish it is the present perfect that is “marked” in the relevant sense. Relevantly, in both French and German the simple past is in the process of being replaced by a compound past tense form, the compound past having originated as a dedicated perfect – in spoken French, the *passé simple* has been fully supplanted by the *passé composé*. It may be that the contextual salience requirement for a simple past tense is typologically linked to a particular semantic relationship between the simple past and the present perfect. An alternative is that there might be some more fundamental difference in the semantics of either tense or the perfect in English as opposed to German, a possibility supported by other differences in the interpretation of “the same” temporal categories in the two languages. Pancheva and von Stechow (2004) observe that the Present Perfect Puzzle—the incompatibility of the present perfect with definite past adverbials—does not arise in German, a fact that they attribute in part to a different semantics for the present tense.

The infelicity of the German (and French) simple past in out of the blue contexts may plausibly be attributed to competition with the compound past, rather than to the pronominal nature of past tense. This weakens the force of this analogy in providing direct evidence for analyzing tense as a temporal pronoun.

4. WHERE DOES THIS LEAVE US?

The point of section 2 was that from the perspective of current syntactic or structural analyses, tenses look very different from pronouns. The review in section 3 demonstrates that many of the parallel interpretations between pronouns and tenses identified in Partee (1973) and Kratzer (1998) are comparatively weak (the disanalogy in section 3.5), or can be attributed to other properties of the sentences in which they arise, whether to other mechanisms of context-sensitivity (section 3.1), to the asymmetric interpretations available to coordination (section 3.2), to the aspect of the predicate (sections 3.3–3.4), or to competition among past-referring forms in a given language (section 3.7). This leaves the potential analogy between the features

of bound variable pronouns and Sequence of Tense (section 3.6) as the strongest parallel remaining, though it is dependent on the success of Feature Transmission as a morphosyntactic mechanism that applies in both cases.

If we consider a strong version of a structural and interpretive parallel between pronouns and tenses (the idea that tenses refer to times in essentially *the same way* that pronouns refer to individuals), the result of this review is that the parallel between tenses and pronouns is not conclusively motivated by the analogies originally identified in Partee (1973), or those added in Kratzer (1998).

None of this is to say that the absence of strong analogies between pronouns and tenses demonstrates the non-existence of natural language expressions that refer to times in the way that canonical pronouns refer to individuals, or indeed against temporal variables or indices being involved in the interpretation of tense in some languages.

The main alternative to a pronominal analysis of tense is the quantificational approach, which analyzes semantic tense as an existential quantifier over times. Several quantificational treatments of tense nonetheless explicitly assume that natural language expressions contain temporal variables, corresponding either to tense morphemes on the verb or to the functional head T or one of its features (Stowell 1996; Kusumoto 1999; von Stechow 2002, 2009). There are also relational approaches to tense semantics, as in Zagona (1990) and notably argued for by Demirdache and Uribe-Etxebarria (2007), in which tense itself is properly interpreted as expressing a relation between two time arguments; these time arguments (usually syntactically null) are semantically pronominal (i.e., variables over times) while tense itself is non-pronominal. These all share a less direct analogy between pronouns and tenses than envisioned in Partee (1973) while nonetheless assuming that syntactic structures include time variables.

More recently, several authors have argued that tense contrasts – past vs. present, or among different distances of past tense – are presuppositional in much the same way that gender features on pronouns have been argued to be (Cable 2013; Ogihara and Kusumoto 2021; Aonuki 2021). However, as noted by Ogihara and Kusumoto, the nature of the presupposition is again somewhat different from the presuppositions imposed by features on pronouns, because tenses are inherently context-sensitive in a way that genders are not. Whether a pronoun's gender presupposition is met can be determined by inspecting properties of its referent (or for grammatical gender, properties of a noun with which it corefers or by which it is bound). By contrast, whether a temporal pronoun's tense presupposition is met cannot be determined just by inspecting the time or temporal interval it refers to, but instead requires also knowing the relationship of that time or interval to the relevant time of evaluation. Independent of this difference, just as pronouns are not the only nominal expressions whose reference is context-sensitive, they are not the only nominal expressions that can carry features that trigger presuppositions – in languages with grammatical gender, for example, the grammatical gender on determiners or quantifiers can also impose a presupposition on elements in the domain over which they range. Even if tense is presuppositional, then, this is not a conclusive argument for a parallel with pronouns specifically.

5. CONCLUSION

If by “are tenses like pronouns?” we mean “are tenses obviously subject to the range of binding phenomena typical of pronouns?” the answer seems to be “no.” Tenses moreover have neither the same internal structure as pronouns are increasingly argued to have, nor the same distributional profile (tenses typically occur above a lexical predicate, while pronouns rarely do). But if by “are tenses like pronouns?” we instead mean “can natural language quantify over or refer to times?” this is quite a different question, and one beyond the scope of the review in this article; this question has been taken up in work such as Kusumoto (1999).

If some syntactic elements are interpreted as variables over times, the question that arises is: which ones? A strictly Minimalist approach to semantic composition must attribute such variables to a head or a feature, the atoms over which syntax operates. If finite tense is featurally complex – involving both a [FIN] feature and a [PAST] or [PRESENT] feature, for example – then any one of its features could be interpreted as a time variable, without the interpretation of the tense head *T* as a whole being a variable.

But if what is interpreted is the set of features from which the syntactic representation is composed—the same features that are ultimately interpreted—then a semantic analysis of tense must grapple seriously with the possibility that the interpretation of tense may vary considerably across languages, either in the organization of features that encode tense, or in the precise interpretation of those features. Ogihara and Sharvit (2012), for example, have proposed that languages may vary in terms of whether they exhibit pronominal or quantificational tense, while Chen et al. (2020) have argued further that a single language may exhibit both pronominal and quantificational tenses. Pancheva and Zubizarreta (2020) argue that some morphologically tenseless languages, specifically Paraguayan Guaraní, are entirely semantically tenseless, with the temporal interpretation of a clause arising entirely from viewpoint aspect.¹⁴ We might wonder if this variation is constrained in the same way that has been proposed for pronouns in work such as Déchaine and Wiltschko (2002), or if temporal systems vary more widely than pronominal systems do.

Tense systems do appear to vary in ways that pronominal systems do not, in that they can be based on fundamentally different basic contrasts. While pronominal systems are fairly constrained in allowing contrasts between first, second, and third persons (with potential additions of clusivity contrasts in the plural, or limited further distinctions among third persons), the basic contrasts in tense systems vary more widely. A language like English can be viewed as encoding a basic contrast between past and non-past (because the present tense can be used for future events in some contexts), whereas Matthewson (2006) has argued that a language like St’át’imcets instead opposes future and non-future, and Bochnak (2016) has

¹⁴Pancheva and Zubizarreta (2020) argue that in the absence of tense, the time argument of viewpoint aspect is the evaluation time. By default the evaluation time is the present, but the time of evaluation can be shifted to a contextually salient past time, as in Schlenker (2004)’s analysis of the historical present.

argued that Washo contrasts an overt past tense not with non-past but with an unrestricted zero tense that can be used to describe past as well as non-past events.

A fruitful avenue for future research may be to relate such semantic differences across tense systems to potential syntactic or morphological variation, whether in the inventory of formal features active in particular languages, or in whether all languages have identical sequences of functional projections in the clausal spine, as in the cartographic approach of Cinque (1999) and other authors, or at least broadly similar functional domains, as in Wiltschko (2014). The more we come to understand tense systems as differing quite widely from one another in their semantics, the more this motivates serious investigation of similarly wide differences in their syntax or morphology.

REFERENCES

- Abney, Steven. 1987. The English noun phrase in its sentential aspect. Doctoral dissertation, Massachusetts Institute of Technology.
- Aonuki, Yurika. 2021. Relative pronominal tense: Evidence from Gitksan, Japanese, and English. Master's thesis, University of British Columbia.
- Arregui, Ana. 2009. On similarity in counterfactuals. *Linguistics and Philosophy* 32(3): 245–278.
- Asher, Nicholas, and Alex Lascarides. 1993. Temporal interpretation, discourse relations, and commonsense entailment. *Linguistics and Philosophy* 165: 437–493.
- Asher, Nicholas, and Alex Lascarides. 2003. *Logics of conversation*. Cambridge: Cambridge University Press.
- Asher, Nicholas, and Laure Vieu. 2005. Subordinating and coordinating discourse relations. *Lingua* 115: 591–610.
- Bar Lev, Zev, and Arthur Palacas. 1980. Semantic command over pragmatic priority. *Lingua* 51(2–3): 137–146.
- Bjorkman, Bronwyn M. 2013. A syntactic answer to a pragmatic puzzle: The case of asymmetric *and*. In *Syntax and its limits*, ed. Rafaella Folli, Christiana Sevdali, and Robert Truswell, 392–408. Oxford: Oxford University Press.
- Bjorkman, Bronwyn M. 2018. Pronominal tense and anaphora: Evidence from sequence of tense. Paper presented at the annual meeting of the Canadian Linguistic Association, Regina, SK.
- Bochnak, M. Ryan. 2016. Past time reference in a language with optional tense. *Linguistics and Philosophy* 39(4): 247–294.
- Bochnak, M. Ryan. 2017. Sequence of optional tense. In *Proceedings of Semantics and Linguistic Theory (SALT 27)*, ed. Dan Burgdorf, Jacob Collard, Sireemas Maspong, and Brynhildur Stefánsdóttir, 636–654. Washington, DC: Linguistic Society of America.
- Cable, Seth. 2013. Beyond the past, present, and future: Towards the semantics of ‘graded tense’ in Gikūyū. *Natural Language Semantics* 21(3): 219–276.
- Cardinaletti, Anna, and Michal Starke. 1994. The typology of structural deficiency: A case study of the three classes of pronouns. In *Clitics in the languages of Europe*, ed. Henk van Riemsdijk, 145–234. Berlin: Mouton de Gruyter.
- Chen, Sihwei, Jozina Vander Klok, Lisa Matthewson, and Hotze Rullmann. 2020. The ‘experiential’ as an existential past. *Natural Language and Linguistic Theory* 39(3): 1–50.

- Cinque, Guglielmo. 1999. *Adverbs and functional heads: A cross-linguistic perspective*. Oxford: Oxford University Press.
- Conrod, Kirby. 2019. Pronouns raising and emerging. Doctoral dissertation, University of Washington.
- Cowper, Elizabeth. 1998. The simple present tense in English: A unified treatment. *Studia Linguistica* 52(1): 1–18.
- De Wit, Astrid. 2016. *The present perfective paradox across languages*. Oxford: Oxford University Press.
- Déchaine, Rose-Marie, and Martina Wiltschko. 2002. Decomposing pronouns. *Linguistic Inquiry* 33(3): 409–442.
- Demirdache, Hamida, and Myriam Uribe-Etxebarria. 2007. The syntax of time arguments. *Lingua* 117(2): 330–366.
- Elbourne, Paul D. 2005. *Situations and individuals*. Cambridge, MA: MIT Press.
- Enç, Mürvet. 1987. Anchoring conditions for tense. *Linguistic Inquiry* 18(4): 633–657.
- Farkas, Donka F., and Yoko Sugioka. 1983. Restrictive *if/when* clauses. *Linguistics and Philosophy* 6(2): 225–258.
- Heim, Irene. 2002. File change semantics and the familiarity theory of definiteness. In *Formal semantics: The essential readings*, ed. Paul Portner and Barbara H. Partee, 223–248. Oxford: Blackwell.
- Heim, Irene. 2008. Features on bound pronouns. In *Phi theory: Phi features across modules*, ed. David Adger, Daniel Harbour, and Susana Béjar, 35–56. Oxford: Oxford University Press.
- Iatridou, Sabine. 2000. The grammatical ingredients of counterfactuality. *Linguistic Inquiry* 31(2): 231–270.
- Ippolito, Michela. 2013. *Subjunctive conditionals: A linguistic analysis*. Cambridge, MA: MIT Press.
- Kamp, Hans. 1981. A theory of truth and semantic representation. In *Formal semantics: The essential readings*, ed. Paul Portner and Barbara H. Partee, 189–222. Oxford: Blackwell.
- Klein, Wolfgang. 1994. *Time in language*. London: Routledge.
- Kratzer, Angelika. 1998. More structural analogies between pronouns and tenses. In *Proceedings of Semantics and Linguistics Theory (SALT) 8*, ed. Devon Strolovitch and Aaron Lawson, 92–110. Washington, DC: Linguistic Society of America.
- Kratzer, Angelika. 2009. Making a pronoun: Fake indexicals as windows into the properties of pronouns. *Linguistic Inquiry* 40(2): 187–237.
- Kusumoto, Kiyomi. 1999. Tense in embedded contexts. Doctoral dissertation, University of Massachusetts.
- Lawler, John M. 1973. Studies in English generics. Doctoral dissertation, University of Michigan.
- Matthewson, Lisa. 2006. Temporal semantics in a superficially tenseless language. *Linguistics and Philosophy* 29(6): 673–713.
- Merchant, Jason. 2019. Ellipsis: A survey of analytical approaches. In *The Oxford handbook of ellipsis*, ed. Jeroen van Craenenbroeck and Tanja Temmerman, 19–45. Oxford: Oxford University Press.
- Musan, Renate. 1995. On the temporal interpretation of noun phrases. Doctoral dissertation, Massachusetts Institute of Technology.
- Ogihara, Toshiyuki. 1989. Temporal reference in Japanese and English. Doctoral dissertation, University of Texas at Austin.
- Ogihara, Toshiyuki. 1995. The semantics of tense in embedded clauses. *Linguistic Inquiry* 26(4): 663–679.

- Ogihara, Toshiyuki, and Kiyomi Kusumoto. 2021. The interpretation of tense: “I didn’t turn off the stove”. In *The Wiley Blackwell companion to semantics*, ed. Daniel Gutzmann, Lisa Matthewson, Cecile Meier, Hotze Rullmann, and Thomas E Zimmerman, 1463–1486. Hoboken, NJ: Wiley-Blackwell.
- Ogihara, Toshiyuki, and Yael Sharvit. 2012. Embedded tenses. In *The Oxford handbook of tense and aspect*, ed. Robert Binnick, 638–668. Oxford: Oxford University Press.
- Pancheva, Roumyana, and Arnim von Stechow. 2004. On the present perfect puzzle. In *Proceedings of the thirty-fourth annual meeting of the North East Linguistic Society (NELS 34)*, ed. Keir Moulton and Matthew Wolf, 469–484. Amherst, MA: GLSA.
- Pancheva, Roumyana, and Maria Luisa Zubizarreta. 2020. Temporal reference in the absence of tense in Paraguayan Guaran’i. In *Proceedings of the fiftieth annual meeting of the North East Linguistic Society (NELS 50)*, ed. Marian Asatryan, Yixiao Song, and Ayana Whitmal, vol. 50, 265–278. Amherst, MA: GLSA.
- Partee, Barbara H. 1973. Some structural analogies between tenses and pronouns in English. *The Journal of Philosophy* 70(18): 601–609.
- Partee, Barbara H. 1984. Nominal and temporal anaphora. *Linguistics and Philosophy* 7(3): 243–286.
- Patel-Grosz, Pritty, and Patrick Grosz. 2017. Revisiting pronominal typology. *Linguistic Inquiry* 48(2): 259–297.
- Postal, Paul. 1966. On so-called pronouns in English. In *Report on the seventeenth annual Roundtable Meeting on Linguistics and Language Studies*, ed. Francis Dinneen, 177–206. Washington, DC: Georgetown University Press.
- Prior, Arthur N. 1967. *Past, present and future*. Oxford: Clarendon.
- Reichenbach, Hans. 1947. *Elements of symbolic logic*. London: Macmillan.
- Schaden, Gerhard. 2009. Present perfects compete. *Linguistics and Philosophy* 32(2): 115–141.
- Schlenker, Philippe. 2004. Context of thought and context of utterance: A note on free indirect discourse and the historical present. *Mind and Language* 19(3): 279–304.
- Schmerling, Susan F. 1975. Asymmetric conjunction and rules of conversation. In *Speech acts*, ed. Peter Cole and Jerry L. Morgan, 211–231. New York: Academic Press.
- Schulz, Katrin. 2014. Fake tense in conditional sentences: A modal approach. *Natural Language Semantics* 22(2): 117–144.
- von Stechow, Arnim. 2002. Binding by verbs: Tense, person and mood under attitudes. In *Proceedings of the thirty-third annual meeting of the North East Linguistic Society (NELS 33)*, ed. Makoto Kadowaki and Shigeto Kawahara, 379–403. Amherst, MA: GLSA.
- von Stechow, Arnim. 2009. Tenses in compositional semantics. In *The expression of time*, ed. Wolfgang Klein, 129–166. Berlin: de Gruyter.
- Stowell, Tim. 1996. The phrase structure of tense. In *Phrase structure and the lexicon*, ed. Johan Rooryck and Laurie Zaring, 277–291. New York: Springer.
- Stowell, Tim. 2007a. Sequence of perfect. In *Recent advances in the syntax and semantics of tense, aspect, and modality*, ed. Louis de Saussure, Jacques Moeschler, and Genoveva Puskás, 123–146. Berlin: de Gruyter Mouton.
- Stowell, Tim. 2007b. The syntactic expression of tense. *Lingua* 117(2): 437–463.
- Sudo, Yasutada. 2012. On the semantics of phi features on pronouns. Doctoral dissertation, Massachusetts Institute of Technology.
- Tonhauser, Judith. 2011. Temporal reference in Paraguayan Guaran’i, a tenseless language. *Linguistics and Philosophy* 34(3): 257–303.

- Wiltschko, Martina. 2014. *The universal structure of categories: Towards a formal typology*. Cambridge: Cambridge University Press.
- Zagona, Karen. 1990. Times as temporal argument structure. Paper presented at Time in Language, Massachusetts Institute of Technology.