Semantics and Pragmatics of Argument Alternations

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Annu. Rev. Linguist. 2015. 1:63–83

First published online as a Review in Advance on September 25, 2014

The *Annual Review of Linguistics* is online at linguistics.annualreviews.org

This article's doi: 10.1146/annurev-linguist-030514-125141

Keywords

argument realization, causative alternation, dative alternation

Abstract

After setting out the challenges posed by argument alternations for linguistic theory, this article reviews the development of accounts of argument alternations over the past 50 years, documenting a shift from accounts that are primarily syntactic in nature to accounts with semantic and pragmatic components. The remainder of this review consists of case studies of the developing understanding of the semantics and pragmatics of the dative alternation and the causative alternation. Each case study stresses the interplay of semantic and contextual factors in characterizing the relation between the two variants that make up the alternation and in determining the choice of variant in a given context.

1. INTRODUCTION

Many verbs can be found in multiple syntactic contexts, but some pairs of contexts involving a particular verb are taken to be linguistically privileged and, thus, to be an object of linguistic investigation. Two examples are the following pairs of contexts.

(1a) Avery gave an opera ticket to Taylor.

(1b) Avery gave Taylor an opera ticket.

(2a) The looters shattered the store window.

(2b) The store window shattered.

There are some specific hallmarks that set off such contexts. First, when a verb is attested in these contexts, it apparently preserves its core meaning across them, and one context seems to be a paraphrase of the other, as in examples 1*a* and *b*, or if not, the contexts show a significant overlap in meaning, with the meaning of one subsuming the meaning of the other, as in examples 2*a* and *b*. Second and concomitantly, most if not all of the same arguments of the verb are expressed in both contexts, although not in the same way—this is what makes the contexts distinct. Third, other verbs are found in the same pairs of contexts, and all these verbs seem to have something in common semantically with each other, even if what this element of meaning is might be hard to pin down. Thus, the verbs that behave like *shatter* tend to be change-of-state verbs, including *break*, *crack*, *melt*, *open*, and *split*. Other verbs that behave like *give* tend to have meanings that involve a notion of transfer of possession, whether the transfer may be physically instantiated, as in examples 1*a* and *b*, or whether it has a more abstract nature, as in the transfer of a message, such as *The dispatcher radioed the message to the officer/The dispatcher radioed the officer the message*. Relatedly, newly created verbs of the same semantic type as existing alternating verbs are also attested in these pairs of contexts. Thus, new instruments of communication give rise to denominal verbs that can be found in the same pair of contexts as *radio* (De Clerck et al. 2011), as in *I texted the order to the restaurant/I texted the restaurant the order*. These co-occurring characteristics have suggested that there is a systematic relationship between such pairs of contexts and that regular linguistic processes are at play. This general phenomenon is referred to here as argument alternation, but it also goes by other names, including diathesis and valence alternation.[1] The alternations in the two pairs of sentences above, examples 1 and 2, are referred to as the dative and causative alternations, respectively. The syntactic contexts which constitute an alternation are referred to as variants.

Section 2 describes the challenges posed by argument alternations, identifying those that are the focus of this review. Section 3 reviews the development of accounts of argument alternations over the past 50 years, documenting a shift from accounts that are primarily syntactic in nature to accounts that acknowledge semantic and pragmatic components to their analysis. The bulk of this review consists of case studies of the developing understanding of the semantics and pragmatics of the dative alternation in Section 4 and the causative alternation in Section 5. Section 6 offers concluding remarks.

Before continuing, it is worth noting that although this review focuses on English, argument alternations are found across languages, reinforcing the conclusion that this phenomenon is

[1]For discussion of the notion of diathesis and its relation to the notion of voice, see Billings (2007) and Kulikov (2011). For discussion of the notion of valence, see Allerton (2006).

systematic. The causative alternation is well attested cross-linguistically. In some languages the verb in one or even both variants may show an affix (Nedjalkov 1969, Nedyalkov & Silnitsky 1973, Haspelmath 1993, Nichols et al. 2004, Haspelmath et al. 2014); the presence and choice of affix may even depend on the verb itself. The particular affixes involved depend on a language's morphosyntactic resources. In the Russian sentences in examples 3*a* and *b*, the verb has the affix *-s'*, an allomorph of the reflexive affix *-sja*, in one variant.

(3a) Maria otkryla dver'.
Maria.NOM open.PSTfs door.ACC
'Maria opened the door.'

(3b) Dver' otrkyla-s'.
door.NOM open.PSTfs-REFL
'The door opened.'

Some languages also show multiple realizations for the verbs found in the English dative alternation, although the precise syntactic constructions involved depend on each language's morphosyntactic resources (Dryer 1986, Siewierska 1998, Malchukov et al. 2010). Languages usually have a construction, often referred to as a ditransitive construction, that is specialized to verbs of transfer of possession; this construction, which is the topic of another review in this volume (Haspelmath 2015), may take several forms, one of which is a double-object construction as in English (Haspelmath's "secundative alignment"). Not all alternations are attested equally widely across languages; one example is the conative alternation (*Kelly kicked the intruder/Kelly kicked at the intruder*). It is difficult to know whether the full range of alternations described for English is equally well attested across languages because other languages have not yet been investigated as systematically.

2. THE CHALLENGES OF ARGUMENT ALTERNATIONS

Several interrelated challenges arise in the analysis of argument alternations. These challenges stem from the hallmarks of argument alternations set out in Section 1, and, thus, involve the morphosyntactic, semantic, and pragmatic dimensions of the alternations. This review focuses on the semantic and, secondarily, pragmatic relations between the variants and addresses morphosyntactic considerations only as they bear on these other relations. For instance, the review does not discuss why the reflexive affix figures in the causative alternation in many languages, including Russian, as illustrated in example 3*b*; see Burzio (1986), Kemmer (1993), and Alexiadou & Anagnostopoulou (2004), among others. The challenges explored in this review are now set out.

The first challenge, which is a major focus of this review, is how best to characterize the semantic relationship between the two variants that make up an alternation. This challenge has empirical and theoretical facets. The empirical facet involves determining how to characterize the relation between the variants of an alternation: Are they truly paraphrases as they appear to be in the dative alternation? If they are paraphrases, is there nevertheless some other difference between the variants, such as a difference in information structure? If they are not paraphrases, how should the difference in (truth-conditional) meaning be characterized? Different answers may be appropriate for different alternations. Furthermore, even for a particular alternation, the answers to these questions may sometimes be controversial as discussed in Section 4 on the dative

alternation. In other instances, the answer may not be controversial, but there may be more to be said, as discussed in Section 5 on the causative alternation. Once the semantic relation between the variants is understood, the second facet of this challenge is how to formally analyze the relationship between the variants, particularly in those instances in which the variants are not paraphrases. Should one variant be considered basic and the other derived? Most work assumes a derivational relation even though researchers disagree about which variant is basic. Some treatments, however, take both variants to be derived. A further question concerns the grammatical mechanisms involved.

The first challenge—understanding the relation between the variants—is often confronted in tandem with a second challenge: how to account for the alternate realizations of a verb's arguments, as well as any changes in the number of arguments, as in the causative alternation. The nature of the semantic relation between the variants influences the type of account of the realization of arguments characteristic of each variant in an alternation. For instance, if the variants are found to be paraphrases, the alternate realization of arguments might simply be a matter of syntax. However, if the variants are associated with distinct meanings, the alternate realization of arguments might be a consequence of this difference. This challenge is discussed in this review primarily because it impinges on the first challenge.

A third challenge, which figures prominently in the functionalist and psycholinguistic literature, is understanding the factors that determine the choice of variant in a given context. This challenge might seem particularly pertinent when the variants are considered paraphrases, as some researchers suggest for the dative alternation. The question, then, becomes: What determines why one variant is chosen rather than the other? Is the choice a matter of discourse, prosodic, or processing considerations? Section 4 on the dative alternation considers these issues. In contrast, this challenge may seem trivial for alternations such as the causative alternation whose variants clearly convey different truth-conditional meanings, as this difference itself provides a reason to choose one variant over the other. Recent work on the causative alternation suggests there is more to this choice, as discussed in Section 5.

An additional challenge, which is largely set aside in this review, is how to characterize semantically the set of verbs that show a particular alternation. There is often an implicit assumption that it is desirable to provide a unified characterization of the verbs showing a particular alternation, but actually doing so is not always simple. For instance, not only do change-of-state verbs show the causative alternation, but so do some change-of-location verbs, such as *bounce*, *move*, *roll*, and *spin*. However, how to unify these two classes of causative alternation verbs under a single semantic umbrella is not obvious, but see Levin & Rappaport Hovav (1995) and Smith (1970). In fact, it is not always clear whether having a single characterization is either feasible or desirable. For instance, Alexiadou et al. (2006) point out that verbs like *destroy* show the causative alternation in Greek, but not English, whereas Kim (1999) documents systematic differences in the set of verbs showing the locative alternation across languages (*Drew smeared butter on the toast/ Drew smeared the toast with butter*). This challenge has been of particular interest to researchers in first- and second-language acquisition (Pinker 1989, Bley-Vroman & Yoshinaga 1992, Bowerman 1996, Inagaki 1997, Juffs 2000, Bowerman & Croft 2007).

3. THE DEVELOPMENT OF THEORIES OF ARGUMENT ALTERNATIONS

Accounts of argument alternations have taken various forms. To some extent, the types of account posited over the past 50 years reflect the prevailing theoretical trends of their times; argument alternations sometimes even served as a test bed or catalyst for theoretical innovations. Over the same period, an increased understanding of the empirical basis of argument alternations brought

about by the availability of new data sources and new methodologies for analyzing these data has also contributed to their analysis. This section briefly reviews these trends (also see Levin & Rappaport Hovav 2005, chapter 7), and the remainder of this review focuses on the semantic and pragmatic facets of the analysis of argument alternations.

Accounts from the 1960s tended to be primarily syntactic in nature; however, beginning in the 1970s, there was an increasing shift toward accounts with a semantic component, with such accounts truly coming into their own in the 1980s and 1990s. During the 1960s, transformational analyses were proposed for certain argument alternations. Argument alternations seemed amenable to such analyses as they are systematically attested across sets of verbs. Such analyses were directed at accounting for the alternate realization of a verb's arguments characteristic of each alternation, although additional syntactic motivations for these and later analyses were adduced as well (see Fillmore 1965 on the dative alternation). By their very nature, such analyses take an alternating verb to have a single meaning, especially given the then-held assumption that transformations do not change meaning (Katz & Postal 1964). They typically also must make a claim as to which variant is basic; the alternative realization of the verb's arguments arises via a transformation. Taking the dative alternation as an example, the *to* variant is generally taken as basic, as in Emonds (1972) and Hall (1965, p. 58). (See Fillmore 1965 for an account that takes both variants as derived from a more basic variant.)

(4a) Avery gave an opera ticket to Taylor. (*to* variant)

(4b) Avery gave Taylor an opera ticket. (double-object variant)

Many current accounts of the dative alternation—whether derivational or not—are descendants of the derivational account proposed by Larson (1988, 1990). This account introduces a now-important syntactic device, the VP-shell, first posited to handle a range of facts presented by Barss & Lasnik (1986). A VP-shell essentially associates each of the VP-internal arguments with its own verb and, hence, its own VP. This move allows a dative alternation verb to be found in a VP with a complex structure involving two verbal heads, one associated with the theme—the argument being transferred—and one with the recipient argument.

The rise of lexicalism in the late 1960s and early 1970s led to nontransformational treatments of argument alternations in which the variants are simply related by a lexical rule. As discussed for the causative alternation by Wasow (1977, pp. 331–33), argument alternations show the hallmarks of such rules. Thus, Bresnan (1982, p. 25, example 42) proposes a lexical rule for the dative alternation, which formulates it as changes in the grammatical relations of the VP-internal arguments of an alternating verb.

(5a) (OBJ) ↦ (OBJ2)

(5b) (TO OBJ) ↦ (OBJ)

Jackendoff (1975, p. 659) provides a lexical rule for the causative alternation, which contrasts with Hall's (1965, pp. 29–30) and Fiengo's (1980, p. 57) transformational treatments. Dowty (1978; 1979, chapter 6) argues for lexical treatments of these and other phenomena. Although such early lexical treatments focused on the multiple argument realizations that characterize a particular alternation, later lexical treatments confronted the nature of the relation in meaning between the variants.

Lexical treatments, such as Oehrle's (1976) analysis of the dative alternation, draw attention to differences among the variants in an argument alternation, including the perception that in some

instances they convey different meanings. These intuitions led to accounts that posit verbal polysemy: Alternating verbs are systematically listed in the lexicon with two distinct but related meanings. Each of these meanings gives rise to its own distinct realization of the verb's arguments, perhaps through the mediation of an argument structure—a lexical representation of a verb's argument-taking properties. These distinct argument realizations arise because the syntactic realization of an argument depends on its semantic relation to the verb, which may vary across the variants, as each variant is associated with its own meaning. Such an approach was first taken for the locative alternation (Rappaport & Levin 1988). It was then extended to verbs showing the dative alternation (Pinker 1989; Speas 1990; Krifka 1999, 2004; Harley 2003). Speas (1990), for example, proposes that the verb in the *to* variant has a caused-motion meaning, as in the lexical semantic representation in example 6*a*, whereas the verb in the double-object variant has a caused-possession meaning, as in example 6*b*, which subsumes the caused-motion meaning.

(6a) x cause [**y** to come to be at (possession) z]

(6b) x cause [**z** to come to be in STATE (of possession)] by means of [x cause [y to come to be at (poss) z]]

(Speas 1990, p. 88, example 134; p. 89, example 136)

The alternate argument realizations arise because distinct arguments satisfy the semantic conditions for realization as a direct object in each variant: The theme '**y**' does in example 6*a*, whereas the recipient '**z**' does in example 6*b*; see Dowty (1991), Levin & Rappaport Hovav (2005), and Beavers (2011) for more on the semantic determinants of objecthood. Analyses such as Speas's tend to be motivated by lexical semantic considerations, as discussed further in Section 4.

Beginning in the 1990s, a line of work has attributed the differences in meaning between variants to the existence of distinct "constructions"—that is, form–meaning pairings—one for each variant of an alternation, rather than to verbal polysemy. Such an approach was first taken to the dative alternation by Goldberg (1992, 1995). She posits a double-object construction, which pairs the meaning 'X causes Y to receive Z' with the form 'Subj V Obj Obj2' (Goldberg 1995, p. 3). The *to* construction is an instantiation of the caused-motion construction, which pairs the meaning 'X causes Y to move Z' with the form 'Subj V Obj Obl' (Goldberg 1995, p. 3). All verbs, including alternating verbs, are monosemous: Their meaning is the "core" meaning that persists across all their uses. So-called alternating verbs are precisely those whose meaning makes them compatible with the constructions that form an "alternation," although an alternation is really epiphenomenal on this approach (Goldberg 2002). The constructional approach has been extended to other alternations, such as the locative alternation (Iwata 2005, 2008; Nemoto 2005; Boas 2010).

More recently, a "neoconstructionist" approach (Borer 2003; 2005a,b) has emerged within the minimalist approach to syntactic theory (Chomsky 1995). Like the traditional constructional approach, it associates semantic interpretations with syntactic structures, but it takes the syntactic structures themselves to be built according to minimalist syntactic assumptions. Specifically, these structures are made up of multiple functional heads and VP-shells, which essentially constitute a predicate decomposition embodying the construction's meaning. Both forms of the constructional approach share the assumption that a verb—or "root" (Pesetsky 1995) in neoconstructionist approaches—can be associated with a construction if its meaning is compatible with the constructional meaning [Ghomeshi & Massam's (1995, p. 199) Compatibility Principle]. Thus, alternating verbs must have meanings that are compatible with two constructions. The

definition of compatibility, however, is left for further investigation. Proponents of constructional approaches to argument alternations argue that such approaches are better able than non-constructional approaches, known as projectionist approaches, to deal with the great range of syntactic contexts that any individual verb can be found in; these include contexts that may not usually be associated with that verb. They suggest that it does not make sense to lexically associate all these contexts with each verb. Projectionist approaches, in contrast, emphasize the limitations on the syntactic contexts that individual verbs can be found in; these include special contextual conditions that must be met to make some contexts possible. The relative merits of constructional versus projectionist approaches to argument alternations are not assessed here. For further discussion, see Goldberg (1995), Boas (2003), Borer (2003; 2005a,b), and the papers in Cuervo & Roberge (2012) on constructional approaches, as well as Rappaport Hovav & Levin (1998), Reinhart & Siloni (2005), and Müller & Wechsler (2014) on projectionist approaches.

Meanwhile, since at least the 1970s a range of investigations, many of them emerging from the functionalist tradition, have focused on other facets of argument alternations, paying attention to discourse, information structure, processing, and prosodic components in the analysis of at least some alternations. The inclusion of such components in the analysis of argument alternations, especially in the determination of variant choice, has recently gained ground; for further discussion with respect to the dative alternation, see Section 4. Bresnan and colleagues (Bresnan et al. 2007, Bresnan & Nikitina 2009, Bresnan & Ford 2010) have developed regression models that identify a range of factors that determine variant choice for the dative alternation with considerable accuracy. Such accounts seem warranted, particularly in those instances in which there is no obvious truth-conditional difference between the variants in an alternation.

In conclusion, over the past 50 years there has been a move from purely syntactic treatments of argument alternations to accounts that acknowledge that additional dimensions, particularly semantic ones, enter into the analysis of argument alternations. This shift reflects a deeper understanding of the phenomena themselves. Two case studies of the interplay between semantic and contextual factors in the relation between argument alternation variants follow in the next two sections.

4. THE DATIVE ALTERNATION

As the discussion so far suggests, the dative alternation is among the best-studied alternations: It has provided grist not only for syntacticians and semanticists, but also for typologists (Dryer 1986, Malchukov et al. 2010), psycholinguists (Smyth et al. 1979, Arnold et al. 2000), and first- and second-language acquisition researchers (Pinker 1989, White 1991, Juffs 2000, Campbell & Tomasello 2001, Whong-Barr & Schwartz 2002, Year & Gordon 2009). This alternation figures in various theoretical advances: It is used as evidence for both transformations and lexical rules and later as the domain for introducing the notion of a VP-shell. Paralleling these developments is an ongoing consideration of whether there is any significant difference between the two variants in the dative alternation, beyond the obvious difference in the realization of arguments. As reviewed in this section, researchers have noted that for certain choices of argument NPs one variant is available but the other is not, and more recently such observations have been supplemented by observations arising from large-scale corpus studies that show asymmetric tendencies in the distribution of certain kinds of NPs across the variants.

One of the earliest observations that not every *to* variant has a double-object counterpart concerns place names (Green 1974, p. 103; Goldsmith 1980, p. 430). A *to* variant with a place name as the object of *to* lacks a double-object counterpart where the place name is the first of the

two objects, as in examples 7*a* and *b*; however, a *to* variant with an animate entity as the object of *to* does have a double-object counterpart, as in examples 8*a* and *b*.

(7a) The journalist sent the manuscript to New York.

(7b) ??The journalist sent New York the manuscript.

(8a) The journalist sent the manuscript to the editor.

(8b) The journalist sent the editor the manuscript.

Such contrasts are often taken as evidence for a difference in meaning between the variants. Abstracting slightly across analyses, the proposal, already mentioned in Section 3, is that the *to* variant has a caused-motion meaning, whereas the double-object variant has a caused-possession meaning, as schematized in examples 9*a* and *b*.

(9a) CAUSED MOTION: 'NP1 cause NP2 to be at NP3'

(9b) CAUSED POSSESSION: 'NP1 cause NP3 to have NP2'

The oddness of example 7*b* follows because places cannot be possessors: **New York has the book*. This sentence is acceptable only on the reading where *New York* is understood metonymically as referring to an organization or a group of people (Green 1974, p. 103; Harley 2003, p. 37). To quote Harley (2003, p. 37), "Because alienable possessors must be animate, only animate referents may occur in the first DP position in the double object construction. In the double complement construction [*to* variant], it seems that the object of *to* is thematically a location, not necessarily a possessor, and a correspondingly wider range of arguments may appear there."

The distinct meanings posited for the two variants are also used to explain why a listener who hears the double-object variant apparently understands the transfer to be successful, but one who hears the corresponding *to* variant need not make this inference. To take an example, Green (1974, p. 157) writes that "Sentence (2a) [example 10*a*] implies or entails that John has learned linguistics, while (2b) [example 10*b*] merely states that he was a student of linguistics, and is neutral as to whether his teacher Mary had any success in her efforts."

(10a) Mary taught John linguistics.

(10b) Mary taught linguistics to John.

This "successful transfer" inference is often attributed to the difference in meaning between the variants (Goldberg 1992, 1995; Krifka 1999; Harley 2003). The precise explanation is not typically made explicit, but seems to hinge on a goal of motion not having to necessarily be attained, but see Rappaport Hovav & Levin (2008, p. 145) for more discussion. The properties reviewed here, as well as some distributional facts involving idioms (Harley 2003), are taken as further evidence that the *to* variant has a change-of-location meaning and the double-object variant has a change-of-possession meaning.

However, the proposal that a successful transfer inference is tied to the double-object variant has been called into question. Jackendoff (1990, p. 297) writes that he has "been laughed off the podium [trying] to present this claim in public." Baker (1997, p. 89), Davidse (1996, p. 313), and Oehrle (1977, p. 206) point out that successful transfer is defeasible in some instances, such as examples 11*a–d*, and, thus, is at best an implicature and not an entailment.

(11a) I taught them English for an entire year, but they don't seem to have learned a thing.
(Rappaport Hovav & Levin 2008, p. 147, example 40*a*)

(11b) I read him the figures, but when I looked up, he was gone.
(Oehrle 1977, p. 206, example 4)

(11c) I throw you a lifeline and you giggle.
(Leuven Drama Corpus; Davidse 1996, p. 313, example 79)

(11d) I kicked him the ball, but the wind blew it astray.
(Rappaport Hovav & Levin 2008, p. 147, example 40*d*)

On the basis of a systematic examination of the availability of the successful transfer inference across a range of dative alternation verb types, Rappaport Hovav & Levin (2008, pp. 146–50) conclude that it is the verb in the variant that determines whether there is a successful transfer entailment, a successful transfer implicature, or neither. They also show that when such an entailment or inference is available, it holds equally of both variants. Thus, they point out that the ballistic motion verb *throw* simply describes the point at which an object is set in motion and carries no entailment that the goal of motion is reached; thus, it does not entail successful transfer in either variant, as shown in examples 12*a* and *b* from Rappaport Hovav & Levin (2008, p. 147, example 41).

(12a) I threw Mary the ball, but she was looking at the birds flying overhead and didn't even notice.

(12b) I threw the ball to Mary, but she was looking at the birds flying overhead and didn't even notice.

In contrast, the verb *give* is inherently a caused-possession verb (Oehrle 1976, p. 129f), so uses of this verb entail successful transfer (modulo modification by negation, modals, etc.). This entailment cannot be denied in either variant, as illustrated in examples 13*a* and *b* from Rappaport Hovav & Levin (2008, p. 146, examples 36*a* and 37*a*).

(13a) #My aunt gave my brother some money for new skis, but he never got it.

(13b) #My aunt gave some money to my brother for new skis, but he never got it.

On the basis of these data as well as a closer examination of some asymmetries in idioms with dative alternation verbs, Rappaport Hovav & Levin (2008) argue that despite claims to the contrary (e.g., the representations in examples 6*a* and *b*), there is no difference in meaning across the dative alternation variants for verbs like *give*, which are inherently caused-possession verbs. Both variants realize a caused-possession event structure. They attribute any differences between the variants to other considerations that are reviewed below.

Rappaport Hovav & Levin (2008) further argue that the picture is more complex for verbs like *send* and *throw*. These verbs have core meanings that are compatible with two distinct event structures, a caused-motion event structure and a caused-possession event structure, and as a consequence, their association with the dative alternation variants is more complex. The caused-motion event structure is associated with the *to* variant, but only because it is one instantiation of the syntactic frame 'NP1 V NP2 $P_{directional}$ NP3'; it is not associated with the double-object construction. That is, the *to* phrase expresses a type of locational goal; compare other instances of

locational goals, as in *The general sent the soldier into the jungle* or *The player threw the ball into the basket*. As evidence, Rappaport Hovav & Levin (2008, p. 138) point out that path extent modifiers are acceptable with *send* and *throw*, but not *give*, as shown in examples 14*a–c* from Rappaport Hovav & Levin (2008, p. 138, example 16).

(14a) *Susan gave the ball all the way/halfway to Bill.

(14b) Susan threw/kicked the ball all the way/halfway to Bill.

(14c) I sent/shipped the package halfway/all the way around the world to the Antarctic.

The contrast in examples 7*a* and *b* arises because *New York* is a locational goal of a caused motion event and, thus, can be expressed only in the *to* variant. The caused-possession event structure is associated with both the *to* and double-object variants when associated with *send* and *throw*, just as it is with *give*.

As mentioned in Section 3, another line of work, carried out largely independently from the work reviewed so far in this section, argues that the dative alternation variant found in a particular context is determined by other considerations—information structure and, secondarily, constituent weight; see Wasow (1997; 2002, p. 15f) for a discussion and evaluation of several definitions of constituent weight. An ever-increasing number of studies (Ransom 1979, Smyth et al. 1979, Collins 1995, Thompson 1995, Arnold et al. 2000, Wasow 2002, Gries 2003, Snyder 2003) show that independently noted preferences for given material to precede new material (Gundel 1988, p. 229) and for light material to precede heavy material (Quirk et al. 1985, pp. 1361–62) are also relevant to the dative alternation. Specifically, these two preferences underlie a number of distributional observations that emerge from the corpus and experimental studies of the dative alternation described in this work. For instance, Arnold et al. (2000) show that the double-object construction is preferred when the theme is newer or heavier than the recipient. Snyder (2003, p. 126) shows that the *to* variant is preferred when the recipient is not hearer-new and is heavier than the theme. Anttila et al. (2010) suggest that prosodic considerations may play a role in variant choice in that they contribute to some of these distributional asymmetries.

Some of the asymmetries that had previously been taken to argue for a semantic difference among the variants not only can be explained by these information structure and weight considerations, but are actually better explained by them. To take one example, consider the observation that only the double-object variant is acceptable when *give* occurs with the name of a disease, illness, or physical condition (Green 1974, pp. 82–83).

(15a) The long, cold wait gave Sam pneumonia.

(15b) *The long, cold wait gave pneumonia to Sam.

This asymmetry has been explained by appealing to a difference in meaning between the variants. A disease is said to be brought into existence, causing the recipient to have it, rather than being transferred from one location to the other; thus, diseases are incompatible with the *to* variant. Erteschik-Shir (1979, p. 453) proposed an alternative explanation that refers to the notion of givenness, although she phrases it slightly differently. In the default context, the animate recipient Sam is likely to count as given information, whereas the disease is likely to be new information. Taking this analysis together with the preference for presenting given information before new information, the double-object variant is likely to be preferred with disease names. The advantage of this explanation is brought out in a context in which the disease is given and the recipient is new. The information structure account predicts that the *to* variant should be possible in this instance, whereas

the alternative account does not. Indeed, Rappaport Hovav & Levin (2008) find that such *to* variants are attested, as in example 16, drawn from a blog written by a sick mother with sick children.

(16) I think it's time you give your lovely illness to someone else!!!
(Rappaport Hovav & Levin 2008, p. 159, example 69)

In summary, the dative alternation has received and continues to receive syntactic and semantic analyses (Bruening 2010a,b; Ormazabal & Romero 2010, 2012; Colleman & De Clerck 2011), but information structure and weight considerations must also be key components of any account of this alternation (Bresnan et al. 2007, Bresnan & Nikitina 2009, Anttila et al. 2010). Such considerations clearly drive variant choice. Furthermore, although there may be semantic underpinnings to the dative alternation, the links between a verb and the variants are more complex than earlier accounts suggest.

5. THE CAUSATIVE ALTERNATION

In contrast to the dative alternation, it is difficult to deny a difference in meaning between the variants of the causative alternation, another much-investigated alternation. The meaning of the causative variant apparently includes the meaning of the noncausative variant:[2] The causative variant in example 17*a* can be paraphrased roughly in terms of the noncausative variant, "The looters caused the store window to shatter."

(17a) The looters shattered the store window. (causative variant)
(17b) The store window shattered. (noncausative variant)

Concomitantly, the causative variant includes a causer argument—*the looters* in example 17*a*—that the noncausative variant lacks. As with other alternations, a key question is how to characterize and capture the relationship between the variants. Most work on the causative alternation addresses this question by positing a regular relation between the variants, formulating it in syntactic or semantic terms. This section first reviews the motivation for positing such a relation and then briefly sketches how it was dealt with in previous analyses. However, it is becoming increasingly clear that such analyses leave many questions about the distribution of the two variants unanswered: There are a range of asymmetries in the availability of the variants for verbs known to participate in the alternation. Such data, which are reviewed here, show that there is more to a complete analysis of the alternation. Steps toward a full analysis are suggested by Rappaport Hovav (2014) and discussed in the last part of this section. This section proposes that contextual factors are at play over and above any systematic relation between causative and noncausative uses of the alternating verbs, and these factors determine the variant that is appropriate as a description of a given situation.

The overlap in meaning between the causative alternation variants is reflected in the presence of the patient—the argument that undergoes the change specified by the verb—in both variants. However, the patient has a distinct realization in each variant: It is the object of the causative variant and the subject of the noncausative variant. Furthermore, the object of the causative

[2]The intransitive variant of the causative alternation is referred in a various ways. I refer to it as the noncausative variant to avoid a label that reflects on the morphosyntactic form of the verb in this variant. Also see Haspelmath et al. (2014), note 4.

variant and the subject of the noncausative variant appear to share the same selectional restrictions; that is, an NP that is a possible object in the causative variant is a possible subject of the noncausative variant, as shown in the following sentences from Levin & Rappaport Hovav (1995, p. 85, examples 7 and 8).

(18a) Antonia broke the vase/the window/the bowl/the radio/the toaster.

(18b) The vase/the window/the bowl/the radio/the toaster broke.

(19a) *Antonia broke the cloth/the paper/the innocence.

(19b) *The cloth/the paper/the innocence broke.

As discussed by Levin & Rappaport Hovav (1995, p. 85), both variants specify the same change of state, and because this state can hold only of certain entities, only NPs that denote these entities can be the patient argument of the verb. As a consequence, the patterns in examples 18 and 19 arise.

Analyses of the alternation generally capture the relation in meaning between the variants by taking one variant to be basic and the other to be derived. Linguists have taken a range of approaches, including those that take the causative variant to be basic (Levin & Rappaport Hovav 1995; Reinhart 2002, pp. 241–42; Chierchia 2004; Koontz-Garboden 2009), those that take the noncausative variant to be basic (Lakoff 1968; Dowty 1979, pp. 206–7; Hale & Keyser 1986, 2002; Rappaport Hovav & Levin 2012), and those that take both variants to be derived (Hall 1965; Fillmore 1968; Piñón 2001a,b; Doron 2003; Alexiadou et al. 2006; Schäfer 2008). It might seem natural to take the noncausative variant to be basic because the causative variant subsumes the meaning of the noncausative variant; such an approach would add meaning rather than delete it—a move that is taken to be undesirable [Koontz-Garboden's (2007, 2012) Monotonicity Hypothesis]. Approaches that take the causative variant as basic circumvent the problem posed by deleting meaning by arguing that the noncausative variant is underlyingly causative even if only one argument is expressed in it; this proposal is implemented in different ways (Levin & Rappaport Hovav 1995; Koontz-Garboden 2007, 2009).

What is of particular interest here is one motivation for taking the causative variant to be basic: Levin & Rappaport Hovav (1995) point to asymmetries in the NPs that can fill corresponding "positions" in the variants. They note instances in which change-of-state verbs—the prototypical causative alternation verbs—are found in a causative variant that lacks a corresponding noncausative variant, as in the following examples.

(20a) The politician broke his promise to his constituents.

(20b) *His promise to his constituents broke.

(21a) I emptied the cupboard.

(21b) *The cupboard emptied.

Specifically, compared with the causative variant, the noncausative variant appears to have stricter selectional restrictions on the NP that can be its patient. Levin & Rappaport Hovav (1995) take this distributional pattern as evidence that the causative pattern is basic; the idea is that the process that derives the noncausative variant might be constrained to a particular subset of the patient NPs found in the causative variant. They assume that if the noncausative variant were basic, the addition of an argument would be unlikely to make more possibilities available for the patient argument.

However, a range of subsequent work, particularly Rappaport Hovav (2014), which builds on Rappaport Hovav & Levin (2012), shows that the asymmetries among variants for a given choice of verb are much more diverse and pervasive. They include several distinct instances of causative variants lacking corresponding noncausative variants, as well as noncausative variants lacking causative variants. I now review salient examples. Taken together, these examples suggest that there can be strong conditions that determine when a verb known to show the causative alternation is actually found in a particular variant.

Returning to examples of causative variants that lack noncausative counterparts, Rappaport Hovav & Levin (2012, p. 158, note 5) point out that the sentence *The stadium cleared* is acceptable if it describes people leaving a stadium, but not chairs being cleared from a stadium; yet its causative counterpart, *The maintenance crew cleared the stadium*, can be used to describe both situations. Here an unexpressed argument—the stuff being cleared from a location—affects the availability of the alternation. The verb *clear* is a deadjectival verb—a verb that by its very nature is a change-of-state verb—and although deadjectival verbs are included in lists of causative alternation verbs, the reality is more complicated, as the *clear* example already shows. Deadjectival verbs based on dimensional adjectives have causative uses with agentive subjects, such as *The tailor shortened my jacket sleeves*. Such uses lack noncausative counterparts, such as **My jacket sleeves shortened*. Similarly, *The workers widened the street* also lacks a noncausative counterpart, **The street widened*. Nevertheless, as Rappaport Hovav (2014) points out, this noncausative is acceptable when understood as describing a change that takes place along a spatial rather than a temporal axis (Gawron 2008, Koontz-Garboden 2010), as in example 22*a*; however, on this interpretation, a causative counterpart such as example 22*b* does not seem possible (see Rappaport Hovav 2014, p. 14, example 27, for a rare exception).

(22a) . . .and a few meters later the street widened just enough for us to comfortably let him, and about twenty motorbikes, pass by.

(**http://travelogue.travelvice.com/indonesia/kuta-beach-traffic-problems/**; Rappaport Hovav 2014, p. 14, example 26*c*)

(22b) *. . .the construction widened the streets. . . .

(Rappaport Hovav 2014, p. 14, example 26*c*)

Thus, for the same choice of patient, a causative use is available for a change over time but not over space, whereas the noncausative use is available in the reverse situations.

Given these asymmetries, it is perhaps unsurprising to find instances in which, although causative and noncausative variants are available for a particular choice of patient and both describe a change over time, the variants cannot describe the same situation, as in examples 23*a* and *b* from Rappaport Hovav (2014, p. 18, example 45). Example 23*a* suggests a watch that stops working without anyone specific intervening in its operation, whereas example 23*b* describes a situation in which the watch's owner causes the problem with the watch.

(23a) My watch broke after the warranty ran out.

(23b) I broke my watch after the warranty ran out.

Another set of verbs illustrates that severe restrictions can also be imposed on the causer in the causative variant and that, in some instances, animate causers—the prototypical causers (DeLancey 1984, Croft 1994)—are strongly dispreferred, if not excluded. These examples involve

so-called internally caused change-of-state verbs such as *blossom*, *decay*, *erode*, *rust*, *wilt*, and *wither*, which describe changes of state that come about in the natural order of events due to properties inherent to their patient. These verbs are cited as nonalternating by Levin & Rappaport Hovav (1995, p. 97); however, corpus studies by McKoon & Macfarland (2000) and Wright (2001, 2002) reveal that these verbs are sometimes found in causative uses, so they formally number among the causative alternation verbs.

(24a) The sunny warm weather has bloomed a carpet of spectacular yellow mustard throughout all the vineyards. . . .
(**https://www.facebook.com/pages/Larkmead-Country-Inn/106394309402304**)

(24b) A full restoration is a really big problem because of salt spray that decays the grout. . . .
(Kahtouni 2010)

(24c) Raindrops selectively erode fine clay particles, leaving heavier sand particles. . . .
[British National Corpus B1E 301 (Mannion 1991);[3] Wright 2001, p. 109, example 15*c*]

(24d) The onset of temperatures of 100 degrees or more earlier this month, on top of the drought, has withered crops. . . .
(Schmidt 1986; Wright 2001, p. 115, example 34*b*)

However, these verbs show the causative variant only with what might be called ambient condition causers, rather than agent causers (**The farmer bloomed the yellow mustard*). These verbs, then, show that the availability of the causative variant may be severely restricted due to constraints on the causer. In fact, these are not the only verbs to impose constraints on their causers. Rappaport Hovav & Levin (2012, pp. 163–65) delineate further verbs that show intricate interactions between choice of patient and choice of causer, again severely limiting the availability of the causative variant.

The common denominator across all these data is the presence of the patient. On the basis of this observation, Rappaport Hovav & Levin (2012) propose that causative alternation verbs are lexically associated with their patient only, rather than both their causer and patient arguments, as argued in an earlier work (Levin & Rappaport Hovav 1995). The patient-only account was previously proposed by Alexiadou et al. (2006), primarily on the basis of cross-linguistic morphosyntactic grounds. It is well known that the causative variant must express direct causation—that is, the causer must be the direct cause of the event (Fodor 1970, McCawley 1978, Shibatani 1978, Wolff 2003). Rappaport Hovav & Levin (2012) further suggest that a causer can be realized with a change-of-state verb just when the event being described involves direct causation in the sense defined by Wolff (2003, p. 5). They show that this Direct Causation Condition explains certain restrictions on the causer in the causative variant, such as why internally caused change-of-state verbs are found with ambient condition causes. Although such changes come about in the patient as part of their natural development, certain environmental conditions and natural forces can regulate the onset and rate of change. These changes, however, are normally outside the control of humans, so that agent causers cannot typically regulate these changes directly. An exception is fermentation, whose associated change can be chemically controlled by humans, and

[3]Data cited have been extracted from the British National Corpus (BNC) Online service, managed by Oxford University Computing Services on behalf of the BNC Consortium. All rights in the text cited are reserved.

ferment is sometimes attested with human causers. Rappaport Hovav (2014, p. 22) further argues that changes over space as in examples 22*a* and *b* lack causative variants with agent causers because agents necessarily participate in eventive situations and such changes are stative situations.

Rappaport Hovav (2014, p. 22) then confronts a question that has been neglected in the extensive literature on the causative alternation: Which variant is best used to describe an event in a particular discourse context? She explains why this question arises for the causative alternation: Although the causative alternations variants are not truth-conditionally equivalent, the causative variant entails the noncausative variant, so in principle certain situations could be described by either variant. Given the entailment relation between the variants, Gricean principles are likely to play a role in determining which variant is preferred, if not required, as a description of a particular event.

Drawing on Grice's maxims of conversation, Rappaport Hovav (2014, p. 23) notes, "since an utterance which specifies the cause of the change of state is more informative than one which expresses just the change of state, it is to be preferred, all things being equal." That is, the causative variant is preferred, and the noncausative variant is to be used only when "things are not equal." This happens, according to Rappaport Hovav, in various circumstances, including when the cause can be identified from context, when the cause is not considered relevant, or when the cause is unknown. These points are briefly illustrated here, but see Rappaport Hovav (2014) for a fuller discussion that covers more of the examples reviewed earlier in this section, as well as some others.

Causes can be contextually identified because either (*a*) they are part of what discourse participants know about the way the world works or (*b*) they have been mentioned in the immediate discourse context. According to Rappaport Hovav (2014, p. 24), *Her hair lengthened* lacks a causative counterpart because this change happens in the normal course of events, even if we lack the scientific knowledge needed to precisely identify the cause. The preponderance of noncausative uses of internally caused change-of-state verbs has a similar explanation: The ambient causes are known and do not need to be mentioned. Furthermore, as Wright (2002, pp. 344–46) notes, ambient causers in attested causative uses of these verbs generally include a modifier suggesting that what is usually a default cause of the event is in some way unusual (e.g., *the sunny warm weather* in example 24*a*); thus, in these causative uses the ambient cause's role in bringing about the event is underscored. Alternatively, causes may be contextually identified because they are mentioned in the preceding discourse. In such instances, a noncausative variant may be used to describe the event, as in example 25.

(25) I leaned against the door and it opened.
(Rappaport Hovav 2014, p. 25, example 72*b*)

The noncausative variant may also be used when the speaker does not know the ultimate cause of the event. This appears to be why this variant is rarely used to describe an agentive situation. It is unlikely that a speaker who describes an event brought about by an agent does not know who the agent is. Thus, when an agent is involved in causing an event, that agent, as the ultimate cause of the event, must usually be expressed because "it is more informative to mention the *ultimate* cause of a change of state, if the ultimate cause is known" (Rappaport Hovav 2014, p. 26). Rappaport Hovav points out that someone who has seen a person break a windshield by throwing a rock cannot say *The windshield broke* in answer to the question *What happened?* This sentence can answer this question only when the speaker does not know where the rock came from, for instance, because the thrower is not visible. When an event is nonagentive, however, it may be more difficult to identify its ultimate cause, and the noncausative variant is felicitous; see also DeLancey (1984).

The noncausative variant, for instance, may be used when a change is brought about by a nonagentive causer such as the wind, as such causers also may not be clearly identifiable. Speakers choose a variant, then, based on their intentions, their perspective on the situation being described, and the discourse context.

To conclude, the relation between the causative alternation variants is more complicated than has often been acknowledged to date. Accounts of this alternation must recognize this complexity, explaining both the relation between the causative and noncausative variants and the contextual conditions that determine which variant is chosen when, in principle, both might be possible. Rappaport Hovav's (2014) study of contextual conditions that license—and even require—an agent is an important step in this direction.

6. FINAL WORDS

The earliest syntactic accounts of argument alternations analyze them in a uniform manner, for instance, by giving them all transformational treatments. As argument alternations have become better understood, it has become clear that no single account can cover all alternations. The account of any one alternation has various components, and although there may be some shared elements in the accounts of diverse alternations, the accounts may also differ in some respects. Thus, the dative alternation as it is manifested by *give* is attributed to the availability of two alternate realizations of the arguments of caused-possession verbs by Rappaport Hovav & Levin (2008). In contrast, recent accounts of the causative alternation attribute it to a rule that allows the addition of an external cause with change-of-state verbs, a set of verbs that simply select for a patient argument. Precisely how much similarity and diversity are involved is a matter for continued exploration that encompasses the whole range of argument alternations.

As noted at the beginning of this review, the pairs of syntactic contexts that constitute an argument alternation have been taken to be privileged in that certain verbs may be found in both, while preserving their core meaning and most if not all their arguments, even if the arguments are expressed differently in each context. The evolving accounts of argument alternations reflect different understandings of why such pairs of syntactic contexts are privileged. The transformational accounts of the 1960s and the earliest lexicalist accounts that followed them attribute this privileged status to a direct syntactic relation between the contexts. Later work generally argues that the pairs of syntactic contexts are not directly related, but shows that the relation between the contexts is more complex: It is a matter not only of syntax, but also of semantics and pragmatics. Further investigations reveal that the alternate syntactic realization of arguments that make up an argument alternation are not as interchangeable as the earliest syntactic accounts might implicitly assume: For both the dative and causative alternations, sometimes one variant and not the other may be available for certain choices of arguments or in certain discourse contexts. Analyses are now being developed that acknowledge this facet of argument alternations, which clearly will figure prominently in continuing work on this topic.

DISCLOSURE STATEMENT

The author is not aware of any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

ACKNOWLEDGMENTS

I thank Barbara Partee, Malka Rappaport Hovav, and Judith Tonhauser for discussion of the material in this review and for valuable comments on earlier drafts.

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Annual Review of Linguistics

Volume 1, 2015

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