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"Cause" and Affect:
Evaluative and emotive parameters of meaning among the
periphrastic causative verb in English

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"Cause" and Affect:

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This dissertation investigates the so-called periphrastic causative verbs in English – verbs such as *cause, make, have, force,* and *let* – and distinguishes them with respect to their selectional behavior and inferential properties. I suggest that these verbs are primarily differentiated in terms of the evaluative and affective dispositions of participants in the speech act and the caused eventuality. The empirical basis for this claim incorporates corpora as well as experimental elicitation and judgment tasks. Based on these findings, it is proposed that the selection of periphrastic causative verb in the expression of a directive causative event is governed by the evaluative stance of the patient of the causative verb. I argue that the English verb *cause* in particular is less general than has previously been assumed, that it has at least two different senses, and that its primary sense is restricted to cases of negative speaker sentiment.

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Chapter 1:   Introduction

This thesis is an examination of the periphrastic causative verbs in English and their behavior with respect to the evaluative and affective dispositions of participants in the speech act and encoded causal relation. The sources of data include corpora and controlled elicitation and judgment tasks, as well as a sentiment-encoded lexicon. I argue that the selection of periphrastic verb in the expression of a directive causative event is governed by the evaluative stance of the patient of the causative verb and that the English verb *cause* in particular has a more restricted meaning than has previously been appreciated, that it is polysemous, and that its primary sense is sensitive to the affective state of the speaker.

The domain of interest is the collection of words like *cause, make, have, force,* and *let* – the periphrastic causatives – which differ in meaning except insofar as they all seem to encode causative semantics of some sort. In general, causative meaning has a variety of different expressions in natural language, as well as a number of effects on grammar and lexicalization. While often intuitively present, however, it is not always clear how to diagnose causation. In English, the presence of causation is sometimes signaled by the ability to take a progressive *by*-phrase, which specifies something about the causative event, such as the means of causation (see e.g. Neelman and van de Koot 2010, 81):

(1)   a.   John killed Bill by shooting him with an arrow.
          b.   John wounded Bill by shooting him with an arrow.
          c.   John radicalized Bill by shooting him with an arrow.
          d.   John made Bill run away by shooting him with an arrow.
          e.   ?? John hit Bill by shooting him with an arrow.[1]

However, this simple test is not always felicitous with non-agentive causative constructions and depictive *by*-phrases:

(2)   a.   ? The painting frghtened the children by being unusual.
          b.   ?? The storm made the dog nervous by being so loud.

Furthermore, progressive *by*-phrases can occur with unaccusative verbs to introduce causation, rather than as an indicator of its presence in the unmodified version:

(3)   a.   Little Orson grew into a big man.
          b.   Little Orson grew into a big man by eating John McCann's Steel Cut
               Irish Oats.   (Neelman and van de Koot, 2010, 81)

In general, reliable and universal syntactic criteria for causative constructions are difficult to come by. Although the periphrastic constructions with agentive subjects are generally acceptable with progressive by-phrases – e.g. *John made Bill leave by pushing him through the door* – in this thesis, more reliable semantic criteria will be examined and adopted.

Even beyond the periphrastic causative verbs, causation seems to be an important component of lexical meaning with several grammatical consequences that will be explored in detail herein. In Charles Fillmore's 1970 paper "The Grammar of *Hitting* and *Breaking*", for example, a comparative examination of the behavior of two verbs that initially appear to be grammatically identical reveals

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[1] Note that this sentence is not intended to include a parenthetical *by*-phrase. In other words, the relevant reading is not the same as *John hit Bill with an arrow by shooting it at him*, but the felicity of that sentence reveals complications with the diagnostic.

interesting differences rooted in the nature of and meaning associated with their arguments. The verbs *hit* and *break* are both transitive and both allow instrumental prepositional phrases (Fillmore 1970, 123ff, exx. 6,9):

(4)   a.   John hit the vase with a stick.
          b.   John broke the vase with a stick.

Both can occur with an instrumental subject (Fillmore 1970, exx. 7,10):

(5)   a.   A stick hit the vase.
          b.   A stick broke the vase.

But only *break* can occur intransitively (Fillmore 1970, exx. 5,12):

(6)   a.   *The vase hit.
          b.   The vase broke.

One important difference is that *break*, but not *hit*, in the intransitive sentence (6b) entails a change of state (Fillmore 1970 120ff). Consequently, *break*, but not *hit*, in the transitive sentence (4b) is causative.

        Intransitive change of state verbs can generally be used as causatives (unless blocked by the existence of a morphologically unrelated variant, or "suppletion": *die/kill*, *learn/teach*), and alternations of this kind, between homophonous change of state and causative verbs, are often called Causative/Inchoative alternations and they are remarkably productive among change-of-state verbs (Levin 1993), extending easily to novel inchoatives:

(7)   a.   The right-wing Trumpified during the presidential primaries.
          b.   The presidential primaries Trumpified the right-wing.

There exist some intransitive verbs that have neither morphologically identical zero-causatives nor suppletive causatives and require periphrasis:[2]

(8) a. John sauntered across the room.
 b. *Bill/happiness sauntered John across the room.
 c. The children laughed.
 d. *The clown laughed the children.

Even some change of state verbs tend to resist causativization:

(9) a. The flower blossomed.
 b. *The gardener blossomed the flower.[3]

Most intransitive verbs in English, however, have a causative variant. Indeed, the Causative/Inchoative alternation is just one of several systematic causative alternation seen in English. Another causative alternation involves the expression of induced action by the transitivization of a motion verb:

(10) a. The horse jumped over the fence.
 b. Sylvia jumped the horse over the fence.

(Levin 1993, 31)

There are similar alternations involving verbs of emission (*bang*, *shine*, *squirt*), verbs of spatial configuration (*dangle, hang, perch*), so-called "suffocation verbs" (*choke, drown, suffocate*) and others (Levin 1993, 31-32):

(11) a. The baby burped.
 b. I burped the baby.

(Levin 1993, 32)

The addition of causal semantics, then, has the consequence of altering verbal adicity in English.

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[2] This is an instance of Baker's Paradox: (i) there is a productive generalization, (ii) there are (apparently) arbitrary exceptions, and (iii) there is no negative evidence available to the language learner (see Coppock 2008). There are various attempts to explain the gaps (e.g. Levin & Rappaport-Hovav 1991, 1995, Koontz-Garboden 2009).

[3] There are exceptions to this restriction on *blossom* for subjects of natural forces, as noted by Wright (2002).

As suggested, natural language provides a number of resources for the expression of causation. In many languages, including English as described, causal semantics can be encoded as a part of otherwise idiosyncratic verb meaning. Verbs that directly encode causative meaning in this way are typically called "lexical causatives" and they include words like *kill*, *melt*, and *break*, as well as the causative variants of the alternating verbs mentioned above. These verbs can be roughly paraphrased by means of explicit reference to the causative component of their denotation (see e.g. Lakoff 1965, Talmy 1975, Shibatani 1976, Comrie 1976):

(12) a. John killed Bill.
          'John CAUSED Bill to become dead'.

      b. John melted the ice.
          'John CAUSED the ice to become liquid'.

      c. John broke the window.
          'John CAUSED the window to become broken'.

These are in contrast with transitive verbs like *kick*, *watch*, and *hit* which do not include causation as a part of their meaning.[4] English also provides several semi-productive suffixes that introduce inchoative meaning to otherwise non-inchoative forms – especially adjectives and nouns – producing change-of-state intransitive verbs, thereby forming the "morphological causatives" in their transitive variant (see Keyser and Roeper 1984 for discussion of *-ize*):

(13) a. John blackened his boots.
          'John CAUSED his boots to become black.'

      b. John vaporized the liquid.
          'John CAUSED the liquid to become vapor.'

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[4] Ignoring here the trivial sense common to agentive predicates for which *kick* might be paraphrased as ?*cause to be kicked*, which lacks a necessary result state.

Additionally, English and many other languages make available specialized words that function solely (or primarily, as will be claimed) to introduce causation. These words are variously called "analytic," "syntactic," or "periphrastic causatives:"

(14)   a.   John **caused** Bill to mail the letter.
       b.   John **made** Bill mail the letter.
       c.   John **had** Bill mail the letter.
       d.   John **forced** Bill to mail the letter.
       e.   John **let** Bill mail the letter.

I adopt the term "periphrastic causatives" here. These verbs serve to isolate and make explicit the causative component of meaning that is common among the sentences in (12) and (13) and, as such, represent an abstraction of an important class of predicate meaning.

Lexical causatives and their corresponding periphrastic forms are not fully synonymous, however. In particular, the appropriate range of denotations of lexical causatives appears to be a subset of the denotations of the periphrastic variants. This is revealed by the asymmetry of acceptability for conjunction with the negated verb (Shibatani 1976):

(15)   a.   John didn't break the vase, but he caused it to break.
       b.   #John broke the vase, but he didn't cause it to break.

The possibility of a felicitous conjunction of the type in (15a) – in a scenario in which John places the vase in a precarious location, but someone else knocks it over, for example – demonstrates that the two predicates *break x* and *cause x to break* are not fully synonymous. This pair can be contrasted with the unacceptability of conjunction for synonymous active/passive pairs:

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(16) a. # John loves Mary, but Mary isn't loved by John.
      b. # John doesn't love Mary, but Mary is loved by John.

<div align="right">(Shibatani 1976, 28)</div>

That only one variant of the conjunction of causative sentences is acceptable – (15a) but not (15b) – demonstrates that the relationship between the two sentences is one of inclusion. An analogous relationship holds between a general verb of motion and a verb of manner of motion:

(17) a. John didn't walk to the park, but he went to the park.
      b. # John walked to the park, but he didn't go to the park.

In a non-synonymous, non-inclusive meaning relationship, either conjunction is acceptable:

(18) a. I didn't drive to school, but I walked to school.
      b. I didn't walk to school, but I drove to school.

<div align="right">(Shibatani 1976, 30)</div>

One interesting claim that has been made regarding this distinction (see, e.g., McCawley 1968, Shibatani and Pardeshi 2002, Beavers 2006, *inter alia*) is that natural language encodes different "degrees" or "intensities" of causation. Furthermore, this "degree" of causation, often called "directness," is morphologically iconic. Roughly, the closer the encoding of the causative morpheme to the verbal root (the "compactness" of the verb), the more direct the causative event. In particular, lexical causatives are more direct than periphrastic causatives:

(19) a. John caused Bill to die on Sunday by stabbing him on Saturday.
      b. # John killed Bill on Sunday by stabbing him on Saturday.

<div align="right">(Fodor 1970, 433)</div>

This "directness" manifests as a difficulty in separating the causing event and result state, resulting in infelicity when the causing event (targeted by the *by*-phrase) is

marked as temporally distinct from the resulting event. The lexical construction encodes direct causation, but the periphrastic causative does not. In general, modification of a periphrastic construction results in an ambiguity that is not present for lexical causatives, suggesting that causative scenarios encoded by periphrastic causatives are (potentially) bi-eventive, while those encoded by lexical causatives are conceived as a single event:

(20) a.   John caused Bill to die slowly.
       b.   John killed Bill slowly.

While (20a) allows a reading in which the dying event occurs slowly, but not necessarily the causing event, (20b) has no such reading for many speakers.

Causal directness and morphological iconicity is a cross-linguistically regular phenomenon (Van Valin and Wilkins 1996, Shibatani and Pardeshi 2002) and so causal directness is a good candidate for a cognitively universal distinction, insofar as language is an indicator of thought. But directness is not the whole story as concerns the verbal expression of causation. Even among themselves, the periphrastics seem to show differences in meaning:

(21) a.   She let him mail the letter.
       b.   She had him mail the letter.
       c.   She forced him to mail the letter.

Intuitively, these sentences are not appropriate descriptions of the same kinds of causing events. It will be argued here that the sentences – in addition to whatever other meaning differences might be present – represent points on a potential continuum with respect to how cooperative the patient is in mailing the letter, with *let* corresponding to the most cooperative and *force* the least. In each case, the agent "causes" the patient to mail the letter, but there is nevertheless a difference in terms

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of how much (perhaps patient-internal) resistance must be overcome to do so (see e.g. McCawley 1968, Beavers 2006). I argue in this thesis that these differences are properly analyzed as differences in the causee's inclination to act based on their evaluative stance toward the caused sub-event.

Furthermore, it seems that some periphrastic causatives are best when the caused sub-event is intuitively negative or unpleasant:

(22) a. "You caused me to weep, you caused me to moan, you caused me to leave my home."   ("In the Pines", traditional)
     b. #You caused me to rejoice.

(23) a. It drove him to commit suicide.
     b. ??It drove him to improve his life.

I argue that these verbs are sensitive to the speaker's sentiment toward the event or situation encoded by the non-finite complement clause. As is the case for patient inclination, speaker sentiment is a factor beyond those explored in previous analyses of the periphrastic causative verbs in English.

The thesis is organized as follows: chapter 2 gives background for the study of the periphrastic causative verbs in English, including the philosophical tradition and historical development of the understanding of causation, contemporary theories, the grammatical effects of causation in English, and the historical development and syntactic properties of the periphrastic causatives. Chapter 3 presents prominent linguistic accounts of the periphrastic causatives, and develops the criterion of patient inclination as deterministic in the selection of the verb, supported by corpus examples. Chapter 4 discusses social and affective influences on verb selection, including speaker sentiment and register, including both corpus studies and experimental elicitation and judgment tasks, and chapter 5 concludes.

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Chapter 2:   Background

This chapter gives some background to a study of periphrastic causatives, which will motivate and set the scene for the analysis in subsequent chapters. In particular, the history of the philosophical understanding and treatment of the causal concept is given in section 1, followed by an overview of contemporary theories of causation in section 2. Although in the following chapters causation will be treated essentially as an unanalyzed univocal primitive (i.e. monosemous and non-disjunctive), with variation across causative verbs encoded as constraints above and beyond this core concept,[5] this is a dramatic simplification, as the first two sections of this chapter will make clear. Section 3 is a summary tour of the grammatical properties of causation in English, and section 4 is a discussion of the historical development of the English periphrastic causative verbs as well as their most salient contemporary syntactic features.

A useful starting point for the discussion of causation in this chapter is the description of a very simple example of causation. The scenario is that of a boy pushing a lamp off a table followed by the lamp falling to the ground and breaking. These events might be recounted as *the boy broke the lamp* or *the boy caused the lamp to break*. The former makes use of a lexical causative and the latter a periphrastic causative, but in both cases the description is of a causative event: the

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[5] But see revised conception of causation in the Conclusion.

boy pushing the lamp off the table *caused* the lamp to break.   In this framing,

causation is a relation between two events.   As such, it has several formal

properties. The causation relation is irreflexive (no event causes itself: the lamp

breaking did not cause the lamp to break), antisymmetric (a cause causes an effect,

an effect never causes the cause: the lamp breaking didn't cause the boy to push it),

and transitive (if event A caused event B and event B caused event C, then event A

caused event C: The boy pushing the lamp caused it to fall, the lamp falling caused it

to break, so the boy pushing the lamp caused it to break).   This represents

something of a common understanding of causation and is just about all that is

agreed on by almost everyone, with some hesitation of the designation of causation

as a formal relation,[6] and denial of just about everything by, for example, the

Occasionalists (see below). In any case, it is a rough preliminary characterization of

what is meant here by *causation*.

1.   Early Approaches to Causation

Issues and problems related to causation have been debated by philosophers

since ancient times, and indeed the search for explanations of any kind has often

been conflated with the search for causes.   This identification of scientific

explanation with the discovery of causes is sometimes called the Aristotelean

paradigm (e.g. Kistler 2014), but it appears to have been a more general assumption

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[6] Some theorists believe that causation is better analyzed as the transference of a conserved property
(see below), which accounts for most instances of physical causation, but runs into difficulty in the
cases of social, psychological, causation-by-absence, and otherwise not obviously physical scenarios.

in classical Greek thought. In Plato's *Phaedo*, for example, there is discussion of "the causes of each thing; why each thing comes into existence, why it goes out of existence, why it exists" (96 a 6-10; see also Falcon 2015). But further investigation and reflection on the nature of causation has revealed subtleties and complications that have exposed this intuitive and apparently simple notion as deeply problematic and mysterious.

In this section, a very brief review of the most influential pre-contemporary theories of causation is presented, beginning with the dominant theory from Greek antiquity to the seventeenth century: that of Aristotle.   The highlights are as follows: (i) the existence of causation *per se* is a controversial and contentious issue, (ii) the Aristotelean approach regards causation as a part of an explanatory theory and assumes causes are necessary for their effects, and (iii) Hume claimed that causation cannot be directly observed and is therefore inadequate as an explanation, but is instead only a generalization over regular succession. Contemporary approaches, as well as the Hume-inspired counterfactual analysis of the semantics of causal language that will be adopted here, are discussed section 2.

1.1   Aristotle

Aristotle's writings on causation distinguished four varieties of cause: Material, Formal, Efficient, and Final (*Physics* II 3), which he explicates via the examples of a bronze statue and silver bowl. A statue is made out of some material, and made into some structure by some sculptor with some purpose in mind. The

material the statue is made of – bronze in this example – is the Material Cause. The structure or form of the statue as conceived by the sculptor is its Formal Cause. The action of the sculptor in making it is the statue's Efficient Cause. And the purpose for creating the sculpture is its Final Cause. We would probably refer to the Final Cause today as a "reason" or "purpose" rather than a "cause" – indeed, his "health is the cause of walking" (*Metaphysics* 1013 a.24 – 1014 a.25) is nearly impossible in contemporary English – but both can be answers to a "why" question. Of the four causes, only Efficient Cause conforms to modern notions of causation, but Aristotle's notion of Final Cause has had a lasting influence on subsequent conceptions of causation.

Aristotle seems to assume (in *Physics* and *Metaphysics*) that all nature is governed by purpose; that there is an intended end ('telos') that serves as Final Cause. This is closely related to his idea of first causes: Aristotle claims that nothing is its own cause, but he explicitly rejects the idea of infinite causal regress (*Metaphysics* 994 a. 1 – b. 31), and he proposes therefore that everything has a first (or unmoved) mover (*Physics* 258 b. 10 – 259 a. 20) or a first (ultimate) cause. This is often read as being synonymous with God, but that is not made explicit in Aristotle (see Broadie 2009 , 34). Crucially, though, Aristotle claims that the causal chain must terminate, which had a strong influence on Medieval philosophy (see the following section).

For Efficient Cause, which best corresponds to causation as it is currently conceived, the most important notion is that of necessity. The idea of efficacy, that there is a real causal connection existing in the world and that connection

represents a necessary relation between cause and effect – that a cause is necessary

for the effect[7] – seems to be not at all problematic for Aristotle (see Broadie 2009,

32) and it was mostly taken for granted by anyone who took seriously the idea of

causation up and until the empirical critique of Hume (see below).

1.2 The Medievals and Early Moderns

Thomas Aquinas' treatment of causation was closely tied to his theological

beliefs and his conception of God (see Marenbon 2009, 41). Aquinas, too, argues

against infinite causal regress and explicitly identifies first cause with God: "It is not

possible to proceed to infinity in efficient causes" so there must be some first

efficient cause "which everyone calls God" (*Summa Theologiae* I q. 2 a. 3). To

strengthen the argument (and justify his rejection of the infinite regress) he

distinguishes accidental from essential causation. Aquinas found compelling the

argument that there might be an infinite regress of fathers starting from any one

individual, and allowed that each father would be an efficient cause of his son, but

claimed that the relationship between a father and son is accidental causation,

while, for example, "a stone moved by a stick, and a stick by a hand" is essential

causation (*Summa Theologiae* I q. 46 a. 2 and 7). His explanation of this difference is

obscure, but seems to hinge on whether the effect is wholly predictable.

An alternate medieval theory, and one that Aquinas criticized, was that of

Occasionalism. Occasionalists held that there is no cause other than God and that no

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[7] "When the agent and patient meet suitably to their powers, the one acts and the other is acted on of necessity" (*Metaphysics* book 9, chapter 5; see also Anscombe 1971)

regularities perceived in nature can be relied upon (see Marenbom 2009, 47). They claimed that God cannot do what is impossible, but only that which is logically contradictory is impossible, and outside that restriction there is no real causal connection between perceived events. To account for causal assumptions, some held that God only interrupts the expectations that the world will follow a regular order (an expectation that, of course, he had given us) in the case of miracles.

Descartes, who was mostly concerned with physical processes, believed that the effect was essentially contained in the cause: that "There must be at least as much in the efficient and total cause as in the effect of that cause" (Descartes 1985, i. 285). Elsewhere, he claims that the effect must be somehow similar to the total cause, which led him to "the transference conception" of causation, in which there is the transfer of some quality (e.g. motion) from the causal body to the effected body[8] (see Clatterbough 2009, 58). In other places, however, Descartes essentially identifies himself as an Occasionalist and claims that God continually recreates the universe from moment to moment (Descartes 1985, ii. 33; and see Clatterbough 2009, 59). This is in harmony with the growing popularity of Occasionalism in the early modern period.

The other dominant idea of causation at this time was Materialism. In *Leviathan* and *Concerning Body*, Thomas Hobbes identified cause and effect with agent and patient (see Clatterbough 2009, 63). The properties of the agent are explanatory causes and the properties of the patient are the effects.[9] Ultimately, these notions are circular, since the definitions of agent and patient include causal

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[8] Cp. Transmission theories of causation, described in the next section.
[9] This is reminiscent of the causer and affectedness criteria of modern proto-roles (Dowty 1991).

relationships. Hobbes' materialism often relies on the idea of stronger and weaker forces interacting (Clatterbough 2009, 64),[10] which, like his agent and patient criteria, fails to be explanatory since the concept of a force is usually defined in terms of causal efficacy; it is a reified causal connection.[11]

There were accounts of causation by many of the prominent philosophers of the early modern period (see overview in Clatterbough 2009). Spinoza attacks the vestigial remains of final causes and proposes an inferential interpretation of causation, but much of his writing is confusing and contradictory on this issue. Leibniz essentially denies that causal interactions exist and claims instead that things in the world act in harmony with one another in a way that is indistinguishable from causal interaction, which seems to be a distinction without a difference. It is perhaps not surprising that scientists had much success at this time by simply ignoring the question of final cause and motive force (by e.g. Robert Boyle and Isaac Newton), but problems of causation reared their head even amidst the revolutions in physical science. Newton struggled with the non-mechanical character of gravity (see Clatterbough 2009, 68), which seemed to some people an "occult power" (Newton 1953, 125) and to only highlight the mystery of efficient physical causation.

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[10] Cp. the force-dynamic approaches to causation described in chapter 3.

[11] Besides which, as David Hume puts it, "I begin with observing that the terms of *efficacy, agency, power, force, energy, necessity, connexion,* and *productive quality*, are all nearly synonymous; and therefore 'tis an absurdity to employ any of them in defining the rest" (*Treatise* Book 1, Part III, Section XIV).

1.3   Hume

Probably the most famous and influential non-Aristotelian theory of causation (and the one that most challenged traditional Aristotelian notions on the subject) was that of David Hume. He applied a skeptical empirical approach to the notion, which is "suppos'd to be founded on intuition, and to be one of those maxims, which tho' they may be deny'd with the lips, 'tis impossible for men in their hearts really to doubt it" and found "in it no mark of any such intuitive certainty" (*Treatise* Book 1, Part III, Section III).   He goes on to claim that "every demonstration, which has been produc'd for the necessity of a cause, is fallacious and sophistical" and proceeds to demolish the Aristotelian necessity that had so dominated the thinking on causation till that time. Elsewhere:

> When we look about us towards external objects, and consider the operation of causes, we are never able, in a single instance, to discover any power or necessary connexion; any quality, which binds the effect to the cause, and renders the one an infallible consequence of the other. We only find, that the one does actually, in fact, follow the other. The impulse of one billiard-ball is attended with motion in the second. This is the whole that appears to the *outward* senses. The mind feels no sentiment or *inward* impression from the succession of objects: Consequently, there is not, in any single, particular instance of cause and effect, any thing which can suggest the idea of power or necessary connexion.   (*Enquiry*, 41)

Hume denied the necessary connection between cause and effect, and provided a new reduced conception of cause making use of the features of constant conjunction and regular succession.[12] Indeed, he seemed to extend his skepticism to

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[12] In fact, Hume gave two non-equivalent definitions for *cause*, but it seems likely that one should be read as a definition of the kinds of relations that are called causes, while the other definition was, in part, an attempt to give a psychological explanation for why they are so called: "so united [...] that the idea of the one determines the idea of the other" (see, e.g. Robinson 1962, Richards 1965)

the entire inductive enterprise: "Let men be once fully perswaded of these two principles, *That there is nothing in any object, consider'd in itself, which can afford us a reason for drawing a conclusion beyond it;* and, *That even after the observation of the frequent or constant conjunction of objects, we have no reason to draw any inference concerning any object beyond those of which we have had experience*" (*Treatise* Book 1 Part III, Section XII). In denying necessity, he claims of cause and effect that "I immediately perceive, that they are *contiguous* in time and place, and that the object we call cause *precedes* the other we call effect. In no one instance can I go any farther, nor is it possible for me to discover any third relation betwixt these objects." (*Treatise* Book 1, Part III, Section XIV). Hume's skepticism proved hard to dissolve and it has had an enormous influence on subsequent conceptions of causation.[13]

1.4   Kant

In the introduction to his *Prolegomena to Any Future Metaphysics*, Immanuel Kant wrote "I openly confess my recollection of David Hume was the very thing which many years ago first interrupted my dogmatic slumber and gave my investigations in the field of speculative philosophy a quite new direction" (*Prolegomena*, pg. 8). Kant seemed to be deeply troubled by Hume's claims about cause and effect, but allows that "He demonstrated irrefutably that it was perfectly

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[13] Among the later proponents of Hume's regularity theory, as well as his rejection of the necessity of causation on empirical grounds, was John Stuart Mill, who made it popular to define causal connections in terms of necessary and sufficient conditions (see Wilson 2016). One such definition will be discussed in the next section.

impossible for reason to think *a priori* and by means of concepts such a combination [of cause and effect], for it implies necessity" (*Prolegomena,* pg. 5). Kant maintains the notion of *cause*, however, and insists that it, like other metaphysical notions, is in fact *a priori*, even while denying that reason alone can derive it.

Kant claims that causation is "knowledge lying beyond experience" (*Prolegomena*, pg. 13), a "transcendental" notion.[14] To get around Hume's objections to the possibility that it can ever be known as real, Kant makes use of the distinction of the analytic and the synthetic. Analytic statements (logical truths, tautologies) are statements that "express nothing in the predicate but what has been already actually thought in the concept of the subject" (*Prolegomena*, pg. 14). He includes as analytic statements like "all bodies are extended" since extension is part of the meaning of "body". Synthetic statements (or judgments, as Kant has it) are those that are not analytic. He notes that "Judgments of experience are always synthetical" (*Prolegomena*, pg. 15), which is the class of the *synthetic a posteriori*. Furthermore, analytic statements are *a priori*, but Kant claims that "Metaphysical Judgments, properly so called, are all synthetical" and thus claims the existence of a third category, the *synthetic a priori*, which includes the knowledge that all events have causes. In this way, Kant carves a new metaphysical niche for causal necessity, safe from the skepticism of Humeans (or the vulnerability of potential falsification): it is not derivable from reason or observable by experience, as was convincingly argued by Hume, but nonetheless real and true.

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[14] Perhaps a precursor to semantic primitives (Goddard 1998, 306).

1.5   Causal Eliminativism

Under the metaphysical morass of Kant and his disciples, and given his style of thought, it is perhaps not surprising that Nietzsche took a dramatic, somewhat reactionary stance on causation: "One should not reify 'cause' and 'effect' [...] one should use 'cause' and 'effect' only as pure concepts, that is to say, as conventional fictions for the purpose of designation and communication – *not* for explanation." (*Beyond Good and Evil* sec. 21). But in the early 20th century, Bertrand Russell, too, found the concept of causal law outdated and, ultimately, illusory: "The law of causality, I believe, like much that passes muster among philosophers, is a relic of a bygone age, surviving, like the monarchy, only because it is erroneously supposed to do no harm" (Russell 1913, 1). He believed that all of causation could be reduced to functional dependency, as is often the practice in physical sciences. Wittgenstein also seemed to have no use for causation in terms of necessary law "The hypothesis [of causation] is well-founded if one has had a number of experiences which, roughly speaking, agree in showing that your action is the regular sequel of certain conditions which we then call the causes of the action" (Wittgenstein 1958, 15). In earlier work, he was blunter: "We *cannot* infer the events of the future from those of the present. Superstition is nothing but belief in the causal nexus" (*Tractatus* 5.1361). There seemed to be a taste among some thinkers around this time for the complete removal of causation from the metaphysical ontology.

Russell, for his part, later softened his position of causation. In 1948 he advocated a view of "causal lines" (c.p. causal processes, causal chains – see the

following section) that seemed to allow for the idea of efficient cause in some guise. Indeed, philosophers – and even Russell's venerated physicists – have found it difficult to eliminate the concept of causation completely. The notion seems to exist as part of the background for thought and speech (see, e.g., Searle 1998) and it is questionable whether a coherent conception of reality is even possible without the causal relation.

2.   Contemporary Approaches

Following Hume's skeptical assault on the necessity of the causal relation, John Stuart Mill, a Humean regularity causal theorist, popularized the description of apparently causal events in terms of necessary and sufficient conditions (e.g. Anscombe 1971).[15]   A very influential modern approach to causation in that vein was that of Mackie (1965) who noted that most things we call causes of events are neither necessary nor sufficient for their effect, but are rather a species of conditions he called INUS conditions: "the so-called cause is, and is known to be, an *insufficient* but *necessary* part of a condition which is itself *unnecessary* but *sufficient* for the result" (Mackie 1965, 16).   He provides the illustrative example of investigators concluding that a fire was caused by a short-circuit. In this case, the investigators are not claiming that a short-circuit was necessary for the house catching fire at that time, since any number of other things – a bolt of lightning, an overturned candle, etc. – could have set it on fire. Nor are they claiming that the

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[15] According to the empiricist Mill, there is no objective necessity, despite the need for a logic that included necessity. For Mill, all necessity is verbal (see e.g. Wilson 2016).

short-circuit was sufficient for the house catching fire, since if the short-circuit had occurred and there was no flammable material nearby, for example, the house would not have caught on fire. Rather they are claiming that the short circuit was a necessary part of a complex of conditions,[16] which were together sufficient, but not necessary, for the fire. This seems very different from the Aristotelean account of causes.

Many contemporary approaches are motivated by the need to account for the intuitions of necessity surrounding causation, combined with the empirical difficulties associated with it. The dominant approach in cognitive linguistics is force-theory, which is discussed in the following chapter. In this section, some other prominent contemporary approaches to causation are presented, including the approach – that of counterfactual dependency – that is adopted here.

2.1   Probabilistic Theories

If I am told that smoking causes cancer, I infer that if I smoke I am more likely to get cancer than if I do not.[17] The cause (smoking) raises the probability of the effect (cancer).[18] Probability theorists of causation often claim that this increased (or decreased) probability of an effect is all that causation really is (see Williamson 2009, on which this subsection heavily relies) even beyond inferences from causal

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[16] Determining just what those other conditions might be and distinguishing them from non-contributing properties is, of course, sometimes a problem all its own.

[17] Note that, while this is true of a generic statement, it is not always true of specific statements: "smoking causes cancer" means something different than "smoking caused his cancer". Probability theorists of causation are not always careful about this distinction.

[18] Ignoring here that the use of the lexical causative *raise* ultimately makes this circular as an account of causation. The relation can be restated in terms of correlation.

statements, and that therefore causation should be defined in terms of probabilistic

dependencies.

Probably the earliest serious probabilistic account of causation was that of

Reichenbach.[19] Most famously, he noted that causation could not be reduced to

functional relationships since they are symmetric, while causation is not, and he

analyzed the direction of time in terms of the asymmetric direction of causation

(Reichenbach 1956). Reichenbach introduced the familiar directed graphs often

used to visualize causation, and proposed the Principle of Common Cause, which

allowed him to derive the direction of causation based on the increased probability

of two otherwise independent events given the occurrence of some other event,

their common cause (see Williamson 2009, 189). Good (1961), unlike Reichenbach,

appeals to time in his probabilistic account of causality. He also developed the

notion of causal nets using directed acyclic graphs (see below). Suppes (1970) also

appeals to time in his definition of cause. He defines two event-types, prima facie

cause and spurious cause (Williamson 2009, 191ff). Where A and B are both events:

(24)   *prima facie cause*: (i) $t' < t$, (ii) $P(B_{t'}) > 0$, (iii) $P(A_t|B_{t'}) > P(A_t)$
        spurious cause: for all elements $C_{t''}$ of some prior partition that screens off $B_{t'}$
        from A_t, a *prima facie* cause of $B_{t'}$, (i) $P(B_{t'}C_{t''}) > 0$, (ii) $P(A_t|B_{t'}C_{t''}) = P(A_t|C_{t''})$.

In other words, spurious causes are those "causes" for which some prior event (or

events) is a common cause to both spurious cause and effect, but given the

occurrence of the common cause, the spurious cause does not alter the probability

of the effect. Real causes are all *prima facie* causes that are not spurious causes. For

the case in which a falling barometer might be thought to cause a subsequent storm,

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[19] Reichenbach's earliest accounts were epistemological, rather than metaphysical (see Willaimson 2009, pg 188), but he later offered an analogous metaphysical account.

Suppes' account discounts this as a spurious cause since it is "screened off" from the storm, by the preceding atmospheric conditions (see Salmon 1980).

Causal Nets are Bayesian networks in which the conditionalities of the conditional probability distributions are interpreted to be causal relationships. A Bayesian network, in turn, is a directed acyclic graph whose nodes are variables with probability distributions dependant on their parents. An important assumption, known as the Markov condition, is that each variable is probabilistically independent of its non-descendants, conditional on its parents. Then, the probability of some set of events occurring is the product of the conditional probability of each event occurring, given the occurrence of the parents. So, assume a Bayesian network consisting of the acyclic graph below and the probabilities: P(A) = .3, P(B) = .9, P(C|AB) = .4, P(C|A'B) = .5, P(C|AB') = .1, P(C|A'B') = .8, P(D|C) = .8, P(D|C') = .7.
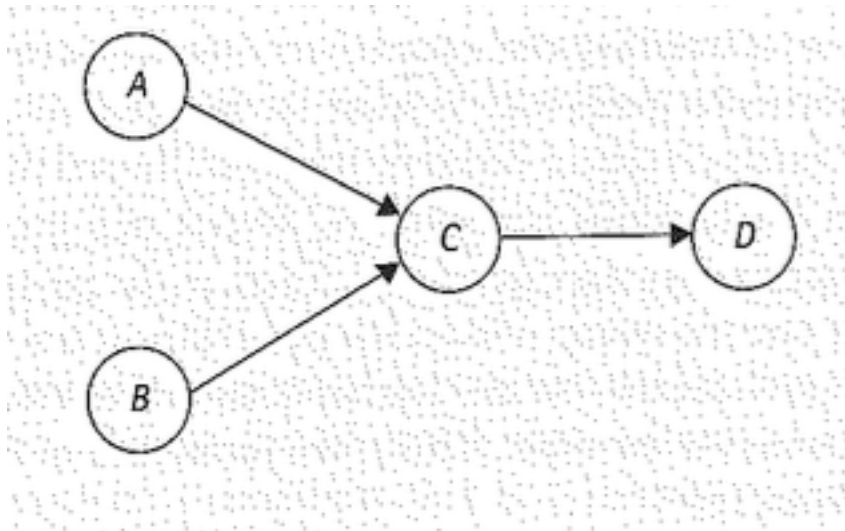
Figure 1: Directed Acyclic Graph

Then, for example, P(AB'CD) = P(A)P(B')P(C|AB')P(D|C) = .3 * .1 * .1 * .8 = .0024 (this example from Williamson 2009, 194). Interpreted causally (The Causal Markov Condition), the Markov condition states that each variable is independent of anything that is not its effect, conditional on its direct causes. It is typically assumed that this condition holds for causation. Necessity clearly plays no role in probabilistic theories of causation.

A related approach to causation is that of the Manipulation theories. Manipulation (or Agency, or Intervention) theories propose that what is characteristic of causal relationships is that they are relationships that can be manipulated with an associated change in outcome. If a relationship is causal, then if the cause is changed in some appropriate way, there will be a change in the effect (see Woodward 2009, 234).[20] Some of the most detailed implementations of this approach to causation are those of Judea Pearl (see, e.g., Pearl 2000). This theory of causation is often implicit in scientific experimental design. An attractive feature of manipulation theories is that they seem to offer a simple and intuitive way of eliminating spurious causes. They, like probabilistic theories, however, run into difficulty in accounting for how causation is recognized in normal cases, when knowledge of conditional probabilities and the effects of manipulation are unknown (but see Pearl & Verma 1991). In some interpretations, Counterfactual theories of causation (see below) are essentially manipulation theories.

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[20] This approach is suggestive in light of Piaget's (1930) claim that a child's first, most primitive concept of causation is of the manipulative "push/pull" variety.

2.2   Transference and Process Theories

A group of approaches sometimes called transference (or production) theories assume that causation involves the transmission of some conserved quantity, like energy (e.g. Dowe 2000), or the interactions of some power, like force. Although these definitions are in danger of circularity depending on how the conserved quantity or power is defined (see discussion of Materialism and footnote 11 above), some proposals along this line have been popular and useful as modeling tools in linguistic theory (see Copley & Wolff 2013). One such prominent view in linguistics and cognitive science is the force-dynamic theory of causation, which will be discussed in the following chapter.

Related to transference approaches to causation are Process theories, which have their root in the later work of Bertrand Russell (see section 1.6) and view causation as essentially a process, rather than a relation. One important view within this approach is that of Wesley Salmon's (1984; and see Dowe 2008) which involves propagation of what he calls a "mark":

> Let P be a process that, in the absence of interactions with other processes would remain uniform with respect to a characteristic Q, which it would manifest consistently over an interval that includes both of the space-time points A and B. Then a mark (consisting of a modification of Q into Q*), which has been introduced into process P by means of a single local interaction at a point A, is transmitted to point B if P manifests the modification Q* at B and at all stages of the process between A and B without additional interactions.
> (Salmon 1984, 148)

He combines this definition with a Reichanbachian probabilistic theory to arrive at his theory of causation. As do other conserved quantity approaches, this account

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fails to handle prevention or causation by absences (see Copley & Wolff 2013): *lack of water caused my thirst.* Furthermore, as concerns causation, a major problem in terms of explanatory adequacy for the transference accounts, and for the production accounts, is a lack of empirical evidence for the proposed quantities beyond their causal efficacy.[21]

2.3 Causal Pluralism and Anti-Reductionism

There are two ways to maintain the existence of causation, and yet deny the possibility of a univocal, non-disjunctive explanation. The first is to deny that it is univocal, and the other is to deny that it can be explained. These are the approaches of Causal Pluralism and Anti-Reductionism, respectively.

There are several causally pluralistic theories, but what they have in common is the shared view that the apparently singular notion of causation is actually a diverse collection of concepts that cannot be reduced to each other (see, e.g., Godfrey-Smith 2009, Psillow 2008). The simplest of these approaches is that there are two concepts of causation: a dependence cause and a production cause (Hall 2003). The first of these corresponds to the counterfactual analysis of causation (see the following section) and the second is essentially the transference theory in the previous section. Hall (2003) argues that there are some situations of which

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[21] Something else these theories have in common is their restriction to physical causation. Some researchers treat abstract and social causation (*She made me do my homework*) as basically metaphoric for physical causation (see Copley & Woolf 2013 pg. 23 for discussion). This thesis resists that approach to non-physical causation and, in fact, I suspect that the opposite approach might even be more fruitful.

properties of counterfactual dependency are true and the properties of transmission of some conserved quantity is false and some situations of which counterfactual dependency is false and conserved quantity transmission is true, but that we call both situation-types *cause*. Not surprisingly, in other theories the causes multiply. Another theory that is interesting for the present purpose is that of Elizabeth Anscombe (1971), who made reference to word meaning. For her, the fact that the periphrastic causative *cause* is more general than lexical causatives like *burn* and *scrape* suggests that the notion of causation might be a very general one that is parasitic on some, possibly huge, number of specific relationships that share some properties and get lumped together as causes. Whether or not some minimal lexical entry for *cause* can be given that corresponds to whatever it is (if anything) that is shared by all these particulars, or whether the only condition on causation is that some lexical causative can be used to describe it is not made clear.

Anti-Reductionists hold that causation cannot be reduced to a non-causal definition, that there is no non-circular completion of a statement like "e caused r if and only if …" (Carroll 2009). Importantly for the treatment of causation in decompositions and other linguistic treatments of that sort, while people who believe that causation is primitive are Anti-Reductionists, not all Anti-Reductionists believe that causation is primitive. The most plausible alternative to this approach, however, would seem to require that causation is in some way observable or accessible via introspection (Carroll 2009, 281), which immediately runs aground of the empirical doubts expressed by Hume.

2.4   Counterfactual Dependency

The semantics of causation are irreducibly modal. If I say that X *caused* Y, I am not only saying that X happened and then Y happened.[22] I am saying that Y happened as a result of X; I am claiming (whether or not such a claim is epistemically or metaphysically justified) that there is some essential connection between X and Y. In other words, I am making a claim not only about the utterance world, but about all possible worlds (see, e.g., Stalnaker 1968).[23] It is perhaps not surprising, then, that the modal construction *par excellence*, conditionals, often express causation. Of course, conditionals can be used to express relations that are not causal.   For example, sometimes the *if*-clause expresses epistemological conditions – what must hold to infer the consequent:

(25)   a.   If the ground is wet, it (must have) rained.
        b.   If her car is out front, she's at home.
        c.   If he's smiling, he won the bet.

Sometimes conditionals express deontic dependence:

(26)   a.   If we're having fish, we should order white wine.
                                                        (McCawley 1981, 49)
        b.   If you're tired, sleep.

And there are even uses of the conditional – sometimes called "biscuit conditionals" – for which the antecedent gives conditions for the relevance of the utterance of the consequent:

(27)   a.   There are biscuits on the sideboard if you want some.
                                                        (Austin 1970, 212)

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[22] *Pace* Hume.
[23] Or rather about all "sufficiently similar" worlds. See discussion below.

b.   If you're interested, there's a documentary about biscuits showing.

But many uses of the conditional express a causal relation:

(28)   a.   If you're boiled in oil, you'll die.
       b.   If Mike straightens his tie once more, I'll kill him.
       c.   If butter is heated, it melts.

                                        (McCawley 1981, 49)

Causal relations can also be expressed via counterfactual conditionals, which is of course a large part of the motivation for the counterfactual dependence analysis of causation:

(29)   a.   If I hadn't heated the butter, it wouldn't have melted.
       b.   If I had heated the butter, it would have melted.

But there can be complications with attempts to test for causation using negative counterfactuals, as suggested by the following attested example:

(30)   I'm gonna die if you touch me one more time. Well, I guess that I'm gonna die no matter what.

                                        ("I've Got a Match", They Might Be Giants)

Denying the antecedent is a fallacy even for causal conditional inferences. It is still somewhat mysterious how (A) *if you shoot me, I will die* can be a logical consequence of the true statement (B) *I will die no matter what*, and yet (A) can seem not to be vacuous (see also footnote 29 below).

One of the more appealing and often repeated definitions of causation makes direct use of the counterfactual conditional (Stalnaker 1968; Lewis 1973): individual or event X caused event Y if Y would not have occurred if not for X.[24] This can be restricted, and absurdities of distance and time avoided, by appealing to

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[24] This definition is tantamount to claiming that X is a necessary condition for Y. Strictly speaking, most of the intuitive candidates for causes of events are neither necessary nor sufficient conditions, but are rather INUS conditions (Mackie 1988), as discussed above.

causal chains[25] and minimal differences between possible worlds (see, e.g., discussion in Dowty 1979). For example, it is straightforwardly true that if a particular window had not been manufactured then it could not have been broken when John happened to throw a ball, but it seems odd to suggest that the manufacture of the window caused it to be broken (or, even worse, *broke it*). There is, however, an arguably "less different" possible world from the actual world in which John doesn't throw the ball and the window is consequently not broken. Since this possible world is more similar to the actual one but the caused subevent still does not occur, John throwing the ball is a better candidate for a cause of the window's breaking than is the manufacture of the window. Roughly, there is a chain of events or conditions between both (i) the manufacture and the breaking event, as well as (ii) the throwing of the ball and the breaking event, but the (ii) chain is shorter than the (i) chain.

This perspective on causation is far from transparent or unproblematic. For one thing, it is not always clear which, if any, world with some particular sufficient condition omitted is less different from the actual one than the worlds with some other omitted.[26] Furthermore, there seem to be more similar preventative possible worlds than those that unhesitatingly get characterized as causative, such as that in which John throws a ball at a slightly different angle or the ball is prevented from striking the window, and there is no clear criterion for how similar is similar

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[25] Or, equivalently, a series of Dowty's (1979, 108) "causal factors."

[26] This is closely related to the so-called "frame problem" in artificial intelligence. Lewis acknowledges the difficulty of this problem: "…the vagueness of over-all similarity will not be entirely resolved. Nor should it be. The vagueness of similarity does infect causation, and no correct analysis can deny it." (Lewis 1973, 560).

enough. Counterfactual approaches also face the difficulty of accounting for causal transitivity. As mentioned above, the causal relation is often said to be transitive (e.g. Lewis 1973, Hall 2000): If X caused Y and Y caused Z, then X caused Z. However, counterfactual conditionals are in general not transitive: it is possible to accept "If J. Edgar Hoover had been a communist, then he would have been a traitor" and "If J. Edgar Hoover had been born a Russian, then he would have been a communist" and yet deny "If J. Edgar Hoover had been born a Russian, then he would have been a traitor" (Stalnaker 1968, 106). Despite these difficulties, entailment and counter-factual dependency are adopted here as a conceptual heuristic for causation.[27]

Caused eventuality entailment can be incorporated into a semantic acceptability judgment by identifying core[28] periphrastic causatives and other causative statements by result entailment and consequent generation of contradiction when the resultant state or event is negated:

(31) a.   # The blast caused the boat to heel, but the boat didn't heel.
      b.   # John made Bill leave, but Bill didn't leave.
      c.   Mary begged Bob to marry her, but he didn't marry her.

<div align="right">(adapted from Wolff and Song 2003, 286)</div>

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[27] Although much of the following discussion will assume that causation is a relation between an individual and an event, rather than between propositions, events, or individuals and propositions, this assumption is not crucial and the approach is compatible with the other formulations.

[28] Included exceptions are the let/allow causative types with sentient patients: *She let him leave, but he didn't leave* (Wolff and Song 2003, 286).

This criterion, however, does not exclude other factive verbs, such as *watch* or *notice*, and so counterfactuality must also be included in the linguistic characterization of causation.[29]

(32) a.   John caused the lamp to break, and if he hadn't done so it wouldn't have.

      b.   #John saw the lamp break, and if he hadn't done so, it wouldn't have.

Note that this subsection focuses more on the semantics than the metaphysics of causation. Some researchers (e.g. Lewis 1973) have seen in the counterfactual approach a correct account of the ontological character of causation, but it has also been adopted by linguists with no such ontological commitment (see especially Dowty 1979). Given the skeptical critique of Hume, in fact, perhaps this kind of conflation is appropriate. The semantics of causation for the constructions of interest – the periphrastic causative verbs in English – are discussed further in subsequent chapters. The general expression of causation in English – beyond conditional expressions – is the topic of the following section.

3.   Causation in English

As discussed in chapter 1, the causal concept[30] has several different expressions in natural language, as well as a number of effects on grammar and

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[29] But note that, strictly, counterfactuality is a sufficient but not necessary condition on causation: while it is true that being shot caused Abraham Lincoln to die, it is clearly not true that if Abraham Lincoln had not been shot he would not have died (see also discussion of INUS conditions above for related subtleties of sufficiency and necessity). Nonetheless, it suffices to target the verbs of interest.

[30] Or concepts, see above.

lexicalization. As a reminder, the presence of causation is often signaled by the ability to take a *by*-phrase (Neelman and van de Koot 2010):

(33) a. John killed Bill by shooting him with an arrow.
   b. John wounded Bill by shooting him with an arrow.
   c. John radicalized Bill by shooting him with an arrow.
   d. John made Bill run away by shooting him with an arrow.
   e. ?? John hit Bill by shooting him with an arrow.[31]

But some not-clearly-causative events can appear in by-phrases while some non-agentive causers cannot:

(34) a. John saw Bill by looking at him through binoculars.
   b. John signaled Bill by waving his hand.
   c. ? The painting frightened the children by being unusual.
   d. ?? The storm made the dog nervous by being so loud.

In general, it seems that reliable purely syntactic criteria for causative constructions are elusive.[32] This is due in part to the variety of ways that causation can be expressed in languages. In this section, some of the expressions of causation in English and the grammatical effects of causal expressions are catalogued and the most common approach to causation in grammar is summarized.

Specifically, a widespread linguistic model of causation in English and other languages involves treating causation as a semantic primitive, with a causative event structure that can be decomposed and is a part of the lexical entry of causative verbs. The decompositional analysis of causative verbs is the topic of the following section, and some types of grammatical evidence for this structure are presented in those that follow.

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[31] Note that this sentence is not intended to include a parenthetical *by*-phrase. In other words, the relevant reading is not the same as "John hit Bill with an arrow by shooting him."

[32] There are indeed exceptions even to the counterfactual tests in the previous section and discussed in the following chapter, such as for causation involving enablement.

3.1   Predicate Decomposition

Predicate meaning is often modeled with primitive aspectual operators in some kind of an event structure (see, e.g., Rappaport-Hovav and Levin, 1998). This allows a sentence like *John got angry* to be modeled in such a way that the aspectual information can be abstracted for the inchoative verb *get*:

(35)   'John got angry.'
          [BECOME [John < ANGRY >]]
          get: [BECOME [x <STATE>]]

Inchoatives and causatives are related by embedded structure in such decompositions, with a primitive CAUSE operator introducing causative semantics:

(36)   a.   Inchoative: [BECOME [x <*STATE*>]]
       b.   Causative: [[x ACT$_{<MANNER>}$] CAUSE [BECOME [y <*STATE*>]]]

Models of this sort easily and naturally capture entailment relations between causatives, inchoatives, and associated stative sentences via embedded sub-structures representing containment of meaning:

(37)   'John made Bill shut the door.'
               → 'Bill shut the door.' → 'The door shut.'→ 'The door was shut.'

       [John CAUSE [Bill CAUSE [BECOME [the-door < SHUT >]]]]
               → [Bill CAUSE [BECOME [the-door < SHUT >]]]
               → [BECOME [the-door < SHUT >]]
               → [the-door < SHUT >]

       Causative: [John CAUSE [BECOME [the-door < SHUT >]]]
       Inchoative: [BECOME [the-door < SHUT >]]
       Stative: [the-door < SHUT >]

These models give a clear and intuitive representation of various ambiguities that will be discussed in more detail in the following sections:

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(38) a.   John opened the door again.   (repetitive: John previously did it)
            [{modifier-again} John CAUSE [BECOME/BE [the door <open>]]]
      b.   John opened the door again.   (restitutive: it was previously open)
            [John CAUSE [BECOME/BE [{modifier-again} the door <open>]]]

They can also model the result state temporal modifier phenomena in sentences discussed in the following sections as well as those like the following:

(39). a.   John gave Mary his car for a week.
       b.   John borrowed the book until next week.

Here, the modifiers *for a week* and *until next week* are not modifying the events of giving, but the result state sub-events of having. These might be represented in event schemas as follows:

(39') a.   [John CAUSE [HAVE [{modifier-for a week} Mary John's car]]]
       b.   [John CAUSE [HAVE [{modifier-until next week} (John) the book]]]

Here, as elsewhere, modification can scope over a result state (see below). In these structures, the similar structure of change of state, location, and possession predicates is made explicit:

(40) a.   Change of State predicates:
            {modifier}[x CAUSE [BECOME/BE[{modifier} y <result-state>]]]

      b.   Change of Location predicates:
            {modifier} [x CAUSE [BE-AT [{modifier} y <location>]]]

      c.   Change of Possession predicates:
            {modifier} [x CAUSE [HAVE [{modifier} y z]]]

Predicate decomposition also allows for a structural account of aspectual classes, which reveals the important role that causation plays in the characterization of the accomplishment class:

(41) Activities -> "John swept the table" [x ACT <manner>]]
      States -> "The table was clean" [x <state>]
      Achievements -> "The sky cleared" [BECOME [x <state>]]
      Accomplishments ->
            "John swept the table clean"
                  [x ACT <manner> [CAUSE [BECOME y <state>]]]
            "John cleaned the table"
                  [x CAUSE [BECOME [y <state>]]]

Aspectual class membership is one way of accounting for the difference between *hit* and *break* – the former is an activity verb, while the latter is an accomplishment verb, which crucially includes causative meaning.

There are problems with decompositional approaches to predicate meaning that are not mentioned here (see e.g. Beavers & Francez 2006), but they are illuminating and suggestive models when it comes to the phenomena discussed. Most importantly for the present purposes, they highlight the central importance of causation for predicate meaning in English and other languages. These approaches are also supported by the adicity-increasing alternations discussed in the previous chapter, as well as effects of causative meaning on argument structure more generally.

3.2 Argument Realization

Causation has a number of effects on argument realization in English in addition to the valence-increasing operation of the causative alternations. The hypothesized causative semantic primitive and associated event structure discussed above are supported by these effects. In general, causative events have special realizations in argument structure, especially in combination with psych verbs that

take an experiencer argument. Many of these intransitive verbs have causative

variants for which the experiencer is an object and the erstwhile object stimulus is

realized as a subject (e.g. Chomsky 1970, Grimshaw 1990, Wechsler 1995). In these

pairs, the same semantic role is realized in different argument positions, which is a

possible challenge to the Uniformity of Theta Assignment Hypothesis (UTAH, Baker

1988) and the Universal Alignment Hypothesis (UAH, Perlmutter and Postal, 1984)

(Cheung & Larson 2014):

(42) a. The child feared the noise.
      b. The noise frightened the child.
      c. I enjoy horror movies.
      d. Horror movies please me.

The challenge that causative psych-verbs pose for semantic accounts of

argument structure is dramatically illustrated by the different role assignments in

the causative and non-causative reflexive sentences:

(43) a. I fear/enjoy myself.
      b. I frighten/please myself.

The difference between (43a) and (43b) is minimal, except the latter is causative

and the former is apparently not:

(44) a. *I fear/enjoy myself by contemplating the future.[33]
      b. I frighten/please myself by contemplating the future.

Relatedly, for some verbs, a missing object can be understood as underlyingly

reflexive, with the causer subject co-referential with an understood object:[34]

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[33] Excepting the idiomatic *enjoy myself* reading, as in "I enjoy myself by playing the guitar."

[34] The causative alternations in English (see previous chapter) make the analysis of some of these sentences unclear.

(45)   a.   He shaved.   (cf. The barber shaved him)
       b.   He sat at the table.   (cf. He sat his guests at the table)
       c.   He turned around.   (cf. He turned his daughter around)

                                                      (Croft 2010, 7-16)

In general, causal semantics pays an important role in subject realization in English and other languages. Causal semantics are a central part of the proto-role entailments associated with subjects, while causal affectedness is a proto-object entailment (Dowty 1991). In fact, it seems that causation is more important than any other entailment when it comes to selecting subjects (Davis & Koenig 2000), outranking even sentience, which accounts for the experiencer subject/object alternation in (42).

Although causers are typically realized as subjects, they can also appear in prepositional phrases. *By*-phrases can introduce causers in passive voice sentences (46) and, arguably, in *by-Xself* adverbial phrases (47) (e.g. Levin & Rappaport-Hovav 1995) as well as those mentioned above:

(46)   The vase was broken by John.

(47)   The door opened by itself.

Non-agentive causers can also be introduced in *from*-phrases:

(48)   The car was wet from the rain.

Although a full account of all the interesting interactions of causation and argument realization is beyond the scope of this work, many researchers have seen causation as the key to the whole enterprise of argument realization via event conceptualization (e.g. Croft 1990, DeLancey 1984, Jackendoff 1990, Langacker 1987, Talmy 1988). Talmy's approach to causation is explored in more detail in chapter 3.

3.3 Result States

A necessary consequence of a canonical causative event is a result state. A result state is licensed by *break*, but not *hit*, which is precisely that state entailed by the change-of-state intransitive variant. The result state, as product of causation, also has a number of realizations and grammatical effects in English. Furthermore, the decompositional structure associated with causal predicates is justified by robust sublexical scope phenomena involving result states.

In English, participles can almost always function adjectivally (Bresnan 1995, 8). Thus, we have *a smiling child*, formed from the present participle of *smile*, *wilted lettuce*, from the past participle of *wilt*, and *an opened can*, from the passive participle of *open*. The latter verbs are often referred to as adjectival passives and they are overwhelmingly associated with result states. For example, *hit* and *break* differ with respect to the behavior and meaning of their adjectival passives: *the broken vase* can refer to a vase that either was, or currently is, broken, while *the hit vase* has only the past event reading. It seems that for almost any predicate that entails a result state and that can be made passive, the passive participle of that predicate can function as a result state adjective. "An opened can" is a can that is in the result state of the event encoded by *open*, "a wrapped present" is a present that is in the result state of having been wrapped, "a broken lamp" is a lamp that has been broken, and so on. In fact, the verbs that encode events without result states

are often those whose passive participles seem to be unable to used adjectivally:

The thanked woman (Bresnan 1995, 14).

An interesting and puzzling phenomenon of English grammar implicating result states involves the apparent sublexical modification of a class of non-static complex event verbs, in which modifiers can sometimes target a specific component of a verb's meaning while leaving the rest of its semantic structure out of its scope. This is demonstrated in (49) below:

(49) a.   The Sheriff of Nottingham jailed Robin Hood for four years.
                        (McCawley 1974, 94; attributed to Robert I. Binnick)
       b.   John left his bicycle at Bill's house until tomorrow.
                                                            (Dowty 1979, 254)
       c.   John went upstairs for a few minutes.
                                                            (Dowty 1979, 255)

In the most natural reading[35] of (49a), *for four years* modifies the sub-event of Robin Hood being in jail, but not the event of The Sheriff of Nottingham putting him there. Similarly for (49b-c), in which the bicycle being at Bill's house, but not John leaving it there, and John being upstairs, but not John going there, are respectively modified by *until tomorrow* and *for a few minutes*. Modification, here, targets a result state. Temporal modification targeting result states can be used for caused change of state, caused change of location, and caused change in possession:

 (50) a.   John opened the door for a few minutes.

       b.   John went outside for a few minutes.

       c.   John borrowed the wrench for a few minutes.

---

[35] I ignore here the iterative reading, in which The Sheriff of Nottingham repeatedly jails Robin Hood over a four-year span, and the durative reading, in which he spends four years bringing about Robin Hood's imprisonment (see Dowty 1979, 251 for discussion).

Result states play a role in several scope phenomena involving causative sentences. One of the more interesting of these is the apparently ambiguous reading of some predicates when modified by *almost*. The sentence (51) below has at least two[36] distinct readings (as glossed in (51i) and (51ii)):

(51) John almost killed Harry.
      i.   'John almost did something to cause Harry to die.'
      ii.   'John did something that caused Harry to be almost dead.'

While in (51i) *almost* scopes over the entire event of killing, in (51ii) it scopes over the result state, i.e. Harry being dead. The sentence (51) can felicitously describe either an event in which John does (or intends to do) something that has no effect on Harry at all, or an event in which, for example, Harry is seriously harmed but survives.

Almost scope ambiguity seems to be related to a larger phenomenon of negation ambiguities, which provide a diagnostic for sublexical semantic structure (Koontz-Garboden & Beavers 2009). This diagnostic probes for which parts of the event structure negation can scope over. Their diagnostic of the verb *drown* is repeated below:

(52) a.   ¬Manner: Bob didn't drown Ponyboy — he electrocuted him instead!

      b.   ¬Cause: Bob didn't drown Ponyboy — he held his head under, but he really died of a heart attack due to shock!

      c.   ¬Result: Bob didn't drown Ponyboy — he choked on the water and some got in his lungs, but he miraculously survived!
                                              (Koontz-Garboden & Beavers 2009)

---

[36] It has sometimes been claimed that (51) has three or more distinct interpretations, but I agree with (Dowty 1979, 244) that it is hard to convince oneself that the proposed readings are, in fact, distinct.

Under the reasonable assumption that the result state of the manner of killing verbs is death, (52a) negates the manner of killing, but not the result state. (52c), on the other hand, negates the result state, but not the manner component of the predicate *drown Ponyboy*, and (52b) represents a negation of the causal semantics.

For many change of state/location/possession verbs, there is a difference in interpretation when they are modified by the so-called repetitive or restitutive *again* (see above), which hinges on whether *again* is modifying the matrix predicate or the result predicate (Beck & Snyder 2001):

(53)   John opened the door again.

Under the repetitive reading of (53), John had previously opened the door and then opened it again, while under the restitutive reading, the door had previously been open and John caused it to again be open. The ambiguity of change of state predicates modified by *again* is analogous to the ambiguity of predicates modified by *almost* or negation.

It is clear from the temporal modification phenomena in (49) and the various semantic scope ambiguities that, at least in some cases, the result states of predicates are singularly accessible for modification. There is even further evidence for this in the behavior of the prefixes *re-* and reversative *un-*, which usually modify not the entire event, but the result state of the event encoded by the verbs they attach to. For example, (54a) is felicitous even if the satellite has never before entered, but only been in, the atmosphere, and (54b) contains a typical use of *unwrap*, in which the agent is not the individual who performed the original wrapping:

(54) a. The satellite reentered the earth's atmosphere at 3:47 p.m.
                                        (Dowty 1979, 256)
       b. John unwrapped the present from his grandmother.

Reenter, then, describes another instance of the result state of entering, "being in," and *unwrap* refers to a reversal of the result state of wrapping, "being wrapped." For verbs that can take these prefixes, the result state is accessible even to morphologically dependant modifiers.

Finally, resultative constructions provide a clear demonstration of the ability of result states in English to have, in principle, some measure of linguistic independence from the activities that cause them. As Wechsler (1997) has pointed out, the resultative secondary predicate *flat* is only associated with the result state of the event. This is in contrast to depictive secondary predicates, which are associated with the entire event:[37]

(55) a. John hammered the metal flat.   (resultative)
       b. John hammered the metal drunk.   (depictive)
                                        (Wechsler 1997, 318)

Since the result state applies to the direct object in (55), an intransitive variant disallows a resultative predicate while allowing the depictive:

(56) a. # John hammered flat.
       b. John hammered drunk.

Resultatives can also frequently allow durative modification of the result state, and they are often ambiguous with modifiers like *almost* and *again*. The availability of result states for modification and predication, as well as the robust effects of

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[37] Depictives can also be associated with the object rather than the subject: *John drank the soda warm*. But these depictive constructions, too, hold over the entire event.

causation on argument structure discussed above, is a large part of the motivation for the decompositional approach to predicate meaning.

Historically, the phenomena illustrated in (49) represented a compelling prop for the theory of Generative Semantics (GS). Proponents of GS proposed that elements of meaning are structurally present in the syntax and then combined prior to lexical insertion (c.f. McCawley, 1974). For the examples in (49), in such a theory, the result state is represented by a constituent in the syntax of a causative sentence and scope of modification is a straightforward consequence of c-command. GS has experienced a revival of sorts[38] with the abstract syntactical components P_{HAVE} (Harley, 1999) and 'little *v*' (see Wechsler 2005 for discussion).

As has been pointed out (Dowty, 1979; Wechsler 2005, 2008), however, GS and its successors do not predict, and are often inconsistent with, the facts about adverbial scope, agent selectional restrictions, and idiom formation. Nonetheless, a version of this approach – one that assumes that predicates can be decomposed into structured event schemata including a primitive CAUSE operator that are relevant for semantic scope phenomena, but that sublexical structure is not represented in the syntax (c.f. Chierchia & McConnell-Ginet 2000, 441-448 for a summary of this approach) – can be very useful for modeling the causative and result-state phenomena discussed above, as well as abstracting over grammatically significant predicate classes.

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[38] More accurately, P_{HAVE} and 'little *v*' represent a variant of a central claim of GS, that complex lexical meaning is syntactically encoded.

Regardless of the syntactic theoretical commitments, then, it seems that, whether or not causation is a metaphysically "real" relation, languages sometimes treat CAUSE as a semantic primitive with very real grammatical consequences.

4. English Periphrastic Causatives

The focus of this thesis is on the periphrastic causative verbs in English. In later chapters, their meaning and distribution will be examined in detail. In this section, their historical development is discussed, including valence patterns and some salient semantic changes, followed by a discussion of their synchronic syntactic behavior.

4.1 Historical Development

Periphrastic causatives as a syntactic structure derive from Indo-European and were present in Old English, albeit with a more restricted use than morphological causatives (Baron 1977, 64). This is consistent with comparatively restricted use of verbal periphrasis in general during this period (Baron 1977, Royster 1922). Based on the written record – which is inevitably restricted to formal register and generally incomplete, especially prior to widespread literacy – the only periphrastic causatives currently in use that had causative meaning in Old English are *make* and *let*. There were other periphrastics that have no current causative cognates, as well as non-causative usages of verbs like *have* and *get* during this period.

The only thorough diachronic study of the English periphrastic causatives that I am aware of is the 1972 dissertation of Naomi S. Baron, republished as "Language acquisition and historical change" (Baron, 1977). This book examines only the verbs *have*, *make*, and *get*, but for study of a limited set, this is an ideal selection, since these are the most polysemous and consequently most difficult to trace of the English verbs examined here. These verbs also developed causative meaning after having other, primary non-causative interpretations. In 4.1.1, 4.1.2, and 4.1.3, I rely on Baron's (1977) account. Section 4.1.4 attempts to fill out the historical record for the other periphrastic causatives examined here and is based on the cited usages in the Oxford English Dictionary.

4.1.1   *Make*

Make precedes both *have* and *get* in its use as a periphrastic causative, but the older verb *macian* wasn't prominent until Late Old English and Early Middle English. Other verb forms were more commonly used to express its common non-periphrastic transitive "create" or "build" meaning. Additionally, other periphrastics, including *læten* (*let* – see section 4.1.4 below) were more common as causatives. The earliest complement patterns for *make* were [(noun) + clause] (*make it that*...), [noun + noun], and [noun + adjective]. The infinitive, which is the most common complement in modern usage, is not documented until late in the 12th century (see Baron 1977, p. 72). *Make* + [noun + infinitive] structures occurred in

both the bare and *to*-infinitive forms. The *to*-infinitive was common through Early

Modern English, and some usages were even found in 19th century:[39]

(57) "Making the dust to fly in all directions"
                          (F. E. Paget, 1859, "Curate of Cumberworth" pg. 153, OED)

The use of *make* with a resistant patient does not seem to have been common

until the end of the 16th century. A past participle verb form complement is

documented in the early 13th century (*made the hours brought*). Instrumental

subjects with passive complements appear in Early Modern English:

(58) "His generosity made him courted by many dependants"
                          (Johnson, 1759 "Rasselas" xvi, OED)

The passive complement without *be* auxiliary persist in some phrases (*he made his

wishes known*). Locative prepositional phrase *make* complements were not ever

productive in English, but are sporadically documented and can be seen

idiomatically in contemporary English (*Make yourself at home*). Attested examples

of the argument realization patterns from Baron (1977) are given below, only some

of which have grammatical analogs in contemporary English. Note that throughout

this discussion, I use Baron's labels for complements, while recognizing that the

word labels (e.g. "Noun") are better thought of as abbreviations for their full phrases

(e.g. "NP"):[40]

(59) a. Clause: Þa he gemacode eac Þurh drycræft, Þæt hy agunnon,
                       swylce hy owice wæron. (= then he made each through
                       sorcery, that they begin [to act] as if they were alive)
                       (Wulfstan, Homilies, I 98, 25, from Baron 1977, 71-2)

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[39] In fact, there is more variation in infinitive form than is reflected by the Baron study or by the Oxford English Dictionary citations. See section 4.2 below.

[40] For the subsequent periphrastic verbs, constructed examples will be given to illustrate the relevant pattern.

b.   Noun: ic macige ðe mycelre mægðe. (= I shall make you a great people) (Genesis xii, 2, from Baron 1977, 72)

c.   Adjective: and heora lufiȝendne ȝemaciaÞ weliȝne ecelice. (= and of them lover make prosperous forever, i.e. and make their lover prosperous forever) (Ælfric, Homilies II 88, 28, from Baron 1977, 72)

d.   Infinitive: Swa makeð Þe halie gast Þe Mon bihalden up to houene. (= So makes the holy ghost the Man command up to heaven, i.e. command the Man up to heaven) (c1175 Lamb. Hom. 159, from Baron 1977, 72)

        Þe deuel... makeð Þe unbilefulle man to leuen swilche wiȝeles. (= the devil makes the unbelieving man to believe such deceits) (c1200 Trin. Coll. Hom. 11, from Baron 1977, 74)

e.   Past part.:   The greke Synon With his fals forswerynge... Made the hors broght in-to troye. (= The Greek Sinon with his false oaths... made the horse brought into Troy) (c1384 Chaucer, H. Fame, I.155, from Baron 1977, 75)

f.   Locative PP: Now hath delthe made vs two at debate for your loue. (= Now death has made the two of us in debate for your love) (1470-85 Malory, Arthur XVIII.xx.761, from Baron 1977, 77)

        Noe yoman of this office... to bere or make oute of this office any breade but by knowledge of the brevour. (a1483 Liber Niger in Househ. Ord., from Baron 1977, 77)

A summary table from Baron (1977, 78) is reproduced below.   A checkmark indicates emergence and an "x" indicates obsolescence of the form:

| | Complements: NP + | | | | | |
Approximate date	Clause	Noun	Adjective	Infinitive	Past. Part.	Locative PP
1000	✓	✓	✓			
1100				✓: bare inf		
1200				✓: 'to' inf		
1300					✓: passive	✓: fig. (pos.)
1400						✓: lit. (dir.)
1500						
1600						
1700						
1800						
1900				✖: 'to' inf	rare: passive	✖: lit.

Figure 2: Historical development of complement-patterns of *make.*

4.1.2   *Have*

The ancestor of *have* (Old English *habban*) did not exist as a causative in Old English. It originally occurred most commonly in its possessive use. Its use as an auxiliary appeared by the 8th century, but was absent from earliest Old English record. There are arguments linking its emergence as a causative with its use as the perfective auxiliary. Semantically, both are resultative. The possessive with past participle (*I have a cup broken*) might have been reanalyzed along two different paths with (1) focus on the resultative meaning becoming the perfective (*I have broken a cup*) and (2) focus on the passive meaning becoming the causative (*I had a cup broken*) (Baron 1977, 80). Other lines of examination, however, suggest that the developments of the two uses were distinct. However, ambiguity in historical examples – as in contemporary examples – make definitive statements about origins difficult.

Causative *have* is cited with clausal complement by the late 12th century, but it was then in limited use and is only currently seen in some somewhat marginal idiomatic expression (*Luck/fate would have it that he succeed*). Locative complements emerged around the same time and were more frequent through late 19th century:

(60)   "There I was had into a whole room full of women."[41]

                    (Fielding 1749 "Tom Jones" XVII.iii)

Adjectival complements with resultative meaning appear around the same period and persist (*He had the game ready*). Similarly, past participle complements emerged late in the 12th century and persist (*I had a man killed*). Noun complements with resultative meaning are cited in 15th century, but are currently marginal (??*He had me a fool*). Infinitives appear in late 14th century. Constructed examples of the argument realization patterns are given below, most of which are grammatical in contemporary English:

(61) a.   Clause: ? John had it that his children would be cared for.
      b.   Noun: Training had the boy a soldier (in no time).
      c.   Adjective: The long walk had John hungry.
      d.   Infinitive: John had Bill (*to) leave the room.
      e.   Past part.:   John had his dog summoned.
      f.   Locative PP: John had his dog into the room.

 The following chart is reproduced from Baron (1977, pg. 88):

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[41] Note also the passive voice, which is impossible (or very restricted) for contemporary *have*. See section 4.2 below.

Approximate date			Complements: NP +			
	Clause	Noun	Adjective	Infinitive	Past. Part.	Locative PP
1000						
1100	✓				✓	
1200			✓			✓
1300				✓: 'to' inf		
1400		✓		✓: bare inf		
1500						
1600						
1700						
1800						
1900				✘: 'to' inf		

Figure 3: Historical development of complement-patterns of *have.*

4.1.3   *Get*

Get has many contemporary meanings and uses. It can be used transitively to mean "acquire" or "receive" – to possess with or without causative meaning – as in *he got a new truck*. It has possessive meaning in the perfective aspect: *He's got a new truck*. It is also used as a resultative or passive auxiliary (*It got destroyed*), to introduce deontic modality (*He has got to maintain it*), as a change of state verb (*He got free*), and as a causative (*he got it fixed*, *John got Bill to leave*), which is of course the focus of this account.

Get emerged as a causative after both *make* and *have*. The verb itself, with any meaning, did not enter English until 12th century, as a borrowing from Old Norse, and didn't occur as causative until 14th century. Prior to that, it occurred with locative constructions (*he should get away*, *get out of the house*) indicating

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motion.[42]   Subsequently, the verb allowed locative complements with causative

meaning (*he got the hillside at his back*).[43]

Infinitive complements of *get* are first cited in the early 15th century, with

optional *to*. Participle complements with causative reading emerged in 16th century,

but the non-intentional "happenstance" reading is not recorded until 1787:

(62)   "I got my right wrist dislocated."
                                          (T. Jefferson, 1787, "Writings", II 249, OED)

Around this period, *get* began being used as a perfective auxiliary (*I got finished last*

night). *Get* was also used as possessive around the end of the 16th century (*I have*

got a car). *Get* + [noun + adjective] (*get it ready*) complementation patterns are

recorded in the late 16th century. It was also used as inchoative late 16th century

(*the strap got loose*), perhaps deriving from a deleted reflexive object. In the mid

17th century, it occurs with "become" meaning with a past participle complement

(*get acquainted*). The *get* passive, meanwhile, is not documented until 19th century.

A causative *get* + [noun + noun] pattern never developed in English **the army will*

get you a soldier (Baron 1977, 98).   Constructed examples of the argument

realization patterns are given below, only some of which are grammatical in

contemporary English:

(63)   a.   Clause: *John got it that his children would be cared for.
       b.   Noun: *Training got the boy a soldier.
       c.   Adjective: The long walk got John hungry.
       d.   Infinitive: John got Bill *(to) leave the room.

---

[42] This origin is suggestive in light of the semantic analysis that will be developed for this verb. See chapter 2.

[43] Jesperson (1961) claimed that the locative derived from the reflexive (*I got myself down -> I got* *down*), which would suggest a prior causative meaning, but this usage occurs after the *get* + [noun + locative] (c1350), which itself occurred after *get* + [locative] (c1300).   The reflexive complement form was not cited until mid 15th century (Baron 1977, .91)

     e.   Past part.:   John got his dog washed.
     f.   Locative PP: John got his dog into the room.

The following summary chart is reproduced from Baron (1977, pg. 101):

Approximate date	Complements: NP +					
	Clause	Noun	Adjective	Infinitive	Past. Part.	Locative PP
1000						
1100						
1200						
1300						✓
1400				✓: 'to' inf		
1500			✓	✓: bare inf	✓	
1600						
1700						
1800						
1900				�✘: bare inf		

Figure 4: Historical development of complement-patterns of *get.*

4.1.4   Cause, force, let, allow, and drive

The noun *cause* was borrowed from French in the 13th century and did not emerge as a verb until the middle of the 14th century. Verbal *cause* occurs with a variety of now-defunct complement patterns, but it is not clear when these became obsolete. Constructed examples of the argument realization patterns are given below, few of which are grammatical in contemporary English:

(64) a.   Clause: *John caused it that his children would be cared for.
      b.   Noun: The fall caused the boy pain.
      c.   Adjective: *The long walk caused John hungry.
      d.   Infinitive: John caused Bill *(to) leave the room.
      e.   Past part.:   *John caused his dog summoned.
      f.   Locative PP: *John caused his dog into the room.
      g.   (none):   John caused pain.

A summary of complements based on first citations in the Oxford English Dictionary is given in the table below:

Approximate date	Complements: NP +						
	Clause	Noun	Adjective	Infinitive	Past. Part.	Loc/Dir PP	(none)
1000							
1100							
1200							
1300							✓
1400	✓			✓: 'to' inf			
1500		✓	✓			✓	
1600				✓: bare inf			
1700							
1800							
1900							
current	✖		✖	✖: bare inf.		✖	

Figure 5: Historical development of complement-patterns of *cause.*

Like *cause*, verbal *force* is historically preceded by a nominal form. As a transitive verb, *force* historically occurs with a variety of idiosyncratic meanings. As a causative, it sometimes appeared with a NP complement, which persists in some limited uses (*The police forced a confession*). More commonly, it was used with the persisting locative or directional PP complement or an infinitive, of which only the *to*-form remains:

(65) a. Clause: *John forced it that his children would be cared for.
       b. Noun: *The fall forced the boy pain.
       c. Adjective: * The long walk forced John hungry.
       d. Infinitive: John forced Bill *(to) leave the room.
       e. Past part.:   *John forced his dog summoned.
       f. Locative PP: John forced his dog into the room.
       g. (none):   John forced a retraction.

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	Complements: NP +						
Approximate date	Clause	Noun	Adjective	Infinitive	Past. Part.	Loc/Dir PP	(none)
1000							
1100							
1200							
1300							
1400				✓: 'to' inf			
1500							✓
1600				✓: bare inf	✓		
1700							
1800							
1900							
current				✖: bare inf.			rare

Figure 6: Historical development of complement-patterns of *force.*

Causative *drive* occurs historically with a restricted set of complementation patterns, the earliest of which is the [NP + PP] causative locative or directional structure. No bare infinitives are recorded in the OED and all recorded constructions – [NP + Adjective], [NP + *to* VP], and [NP + PP] – persist. Constructed examples of all periphrastic complementation types are below:

(66) a.   Clause: *John drove it that his children would be cared for.
       b.   Noun: *The fall drove the boy pain.
       c.   Adjective: The long walk drove John crazy.
       d.   Infinitive: John drove Bill *(to) leave the room.
       e.   Past part.:   *John drove his dog summoned.
       f.   Locative PP: John drove his dog into the room.

Approximate date	Complements: NP +					
	Clause	Noun	Adjective	Infinitive	Past. Part.	Loc/Dir PP
1000						✓
1100						
1200						
1300				✓: 'to' inf		
1400						
1500						
1600						
1700						
1800			✓			
1900						
current						

Figure 7: Historical development of complement-patterns of *drive*.

Early usages of *allow* included a transitive construction that meant "to approve of". There is also the persistent usage with a clausal complement, which means "to grant the truth of (some proposition)". The causative constructions include a contemporary somewhat limited [NP + NP] complement (*He allowed them a break*) and a surprisingly late emerging [NP + PP] complement. The infinitive bare complement emerged early but is currently uncommon in American English varieties, while the currently common *to*-infinitive is attested in the 15th century:

(67) a. Clause: *John allowed it that his children would be cared for.
     b. Noun: *Training allowed the boy a soldier.
     c. Adjective: *The long walk allowed John hungry.
     d. Infinitive: John allowed Bill *(to) leave the room.
     e. Past part.:   *John allowed his dog summoned.
     f. Locative PP: John allowed his dog into the room.
     g. (none):   John allowed a retraction.

Approximate date				Complements: NP +			
	Clause	Noun	Adjective	Infinitive	Past. Part.	Loc/Dir PP	(none)
1000				✓: bare inf			
1100							
1200							
1300							
1400				✓: 'to' inf			✓
1500							
1600							
1700							
1800						✓	
1900							
current				✖: bare inf.			

Figure 8: Historical development of complement-patterns of *allow.*

Causative *let* is found in early Old English and is among the oldest of English periphrastic causatives. For much of the history of English it existed as an auto-antonym, like contemporary *cleave* or *literally*, with a co-existing periphrastic frustrative usage meaning to prevent or hinder. The complementation patterns with the exception of the *to*-infinitive persist today, but the bare NP complement (*he let a groan*) is limited and mostly idiomatic (*let blood*, *bloodletting*), and the [NP + Adjective] pattern is limited to expressions like *let alone* and *let free*.

(68) a.   Clause: *John let it that his children would be cared for.
      b.   Noun: *Training let the boy a soldier.
      c.   Adjective: * The long walk let John hungry.
      d.   Infinitive: John let Bill (*to) leave the room.
      e.   Past part.:   * John let his dog summoned.
      f.   Locative PP: John let his dog into the room.
      g.   (none):   * John let a retraction.

Approximate date	Clause	Noun	Adjective	Complements: NP + Infinitive	Past. Part.	Loc/Dir PP	(none)
1000			✓	✓: bare inf		✓	✓
1100							
1200							
1300				✓: 'to' inf (prob.			
1400				Earlier)			
1500							
1600							
1700							
1800							
1900							
current			limited	✗: 'to' inf.			limited

Figure 9: Historical development of complement-patterns of *let.*

4.2   Syntactic Properties

The English periphrastic causatives in the complement patterns of interest here take an NP or otherwise nominal subject and a non-finite clausal complement (usually a full clause *John caused Bill to leave*, *John made Bill leave* – but sometimes a small clause *John caused Bill pain*, *the announcement made the plans irrelevant*). For full clause complements, the periphrastics differ in whether they select for the auxiliary/infinitive marker *to* or whether they take a bare infinitive. Among the verbs examined here, the following judgments are robust for most standard dialects of American English:

(69) a.   John caused Bill *(to) leave.
      b.   John made Bill (*to) leave.
      c.   John drove Bill *(to) leave.
      c.   John forced Bill *(to) leave.
      d.   John had Bill (*to) leave.
      e.   John got Bill *(to) leave.
      f.   John let Bill (*to) leave.
      g.   John allowed Bill *(to) leave.

There are attested exceptions to these generalizations, but in most cases they are so

infrequent that they might be performance errors or stylistic flourishes.

Nonetheless, a corpus search reveals the following:

(70) And so what happened was, he ended up not being inducted into the Army
      but doing just what DC Comics would have **had** **him** **to** **do**, which was he
      stayed home, he rallied everybody against saboteurs on the home front.[44]

                                                              (NPR_FreshAir, 2012)

(71) I thought it was me. I thought I was just- everything I did was what **made** **me**
      to **have** to leave.

                                                              (ABC_Turning, 1994)

(72) We left Paris shortly after. For years we wandered. Greece, Egypt, And there,
      a technological wonder **allowed** **me** **see** sunrise, for the first time in two
      hundred years...

                                                      (Interview with the Vampire, 1994)

(73) He caught her helping me. The punishment was **forcing** **me** **watch** him... "

                                                              (Bk: Kiss of darkness, 2009)

However, at least one variant from the judgments above – the *to*-infinitive with *let* –

is frequent enough to warrant consideration as a dialectical variant. One example is

below:

---

[44] Note that construction is ambiguous with a possessive *have* and a *to*-phrase specifying purpose or
reason: *I have him to help (with the gardening)*. The story being told in this example makes this
reading unlikely here.

(74) **Let me to go** to a specific. During the campaign, I happened to be travelling with the President for a little bit...

(CNN_Crossfire, 1990)

The non-canonical complement form for *let* is robust enough (at least on CNN), that it is even seen in passive constructions:[45]

(75) No, I'm sure they were stopped and questioned on their way out, but my understanding is they **were let to leave** the property.

(CNN_Burden, 1996)

In general, though, it seems to be relatively difficult for *let* to passivize:[46]

(76) a.   John let Bill leave.
     b.   ?Bill was let leave by John.
     c.   John let Bill know.
     d.   ??Bill was let know by John.

The periphrastics differ with respect to the ease with which they can occur in the passive. Some periphrastics passifize easily and productively while some are somewhat awkward in the construction, and others nearly impossible (see, e.g. Hollmann 2006):

(77) a.   John was forced to leave.
     b.   John was made (to) leave.
     c.   John was allowed to leave.
     d.   ?John was caused to leave.
     e.   ?John was let (to) leave.
     f.   ??John was got/gotten to leave
     f.   *John was had (to) leave.

Have does not seem to allow the passive, but passive *get* sentences are somewhat common in corpora (more so with *gotten* than *got*) despite their awkwardness out of context:

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[45] The *to*-infinitive seem to be allowed more frequently in the passive than the active in general (Steve Wechsler, p.c.). This is certainly true of the periphrastics: *John was made to leave*.
[46] Outside of the frequent idiom *let go* meaning *fire from a position*.

(78)   "'Gross misuses of it for political and sectarian purposes are bound to crop up, and might destroy it; but with periodic sanitary efforts it can probably **be got to** continue in a sturdy, placid way, as is needed.'"
            (Kermode, Frank, 1998, Explorations in Shakespeare's language)

The verb *cause* is a raising-to-object – or Exceptional Case Marking (ECM) – verb. It occurs naturally with pleonastic objects and with idiom chunks and the passive complement is a paraphrase of the active:

(79)   a.   John caused it to rain.
        b.   John caused there to be a shortage.
        c.   John caused the cat to be out of the bag.
        d.   John caused the shit to hit the fan.
        e.   The villain caused his henchmen to kill the hero
                = The villain caused the hero to be killed by his henchmen.

Allow, on the other hand, is a good candidate for an object control verb:

(80)   a.   ? John allowed it to rain.
        b.   ?John allowed there to be a shortage.
        c.   # John allowed the cat (to be) out of the bag.
        d.   # John allowed the shit to hit the fan.
        e.   The villain allowed his henchmen to kill the hero
                =/=   The villain allowed the hero to be killed by his henchmen.

The status of the other periphrastic causatives is less clear. Except *have*[47] and possibly *force*,[48] they all allow pleonastic objects:

(81)   a.   John made it (be) cooler in the room.
        b.   ?John forced it to be cooler in the room.
        c.   John got it to be cooler in the room.
        d.   John let it be cooler in the room.
        e.   * John had it be cooler in the room.

But many are bad with idiom chunks:

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[47] This is explained by a causee animacy requirement for *have*. See chapter 3.

[48] *Force* seems to be better with pleonastic objects in more elaborate contexts: *John forced there to be seats available by dragging the passengers off the train*.

(82) a.   ?John let the cat be out of the bag.
      b.   ??John made the cat be out of the bag.
      c.   ?? John forced the cat to be out of the bag.
      d.   ??John got the cat to be out of the bag.
      e.   *John had the cat be out of the bag.

And only *have* (and possibly *make*) has paraphrasal active and passive complement

clauses:[49]

(83) a.   The villain had his henchmen kill the hero
           =   The villain had the hero be killed by his henchmen.
      b.   The villain made his henchmen kill the hero
           =?=   The villain made the hero be killed by his henchmen.
      c.   The villain forced his henchmen to kill the hero
           =/=   The villain forced the hero to be killed by his henchmen.
      d.   The villain got his henchmen to kill the hero
           =/=   The villain got the hero to be killed by his henchmen.
      e.   The villain let his henchmen kill the hero
           =/=   The villain let the hero be killed by his henchmen.

A summary of this section in given in the table below,[50] where ✖✝ indicates

the presence of some corpus occurrences but general prohibition, % indicates that

the number of occurrences warrants the status of dialectical variation, and ??

indicates uncertain status:

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[49] More accurately, the passive and active complement counterparts are paraphrases for almost all the periphrastics when there is a difference in animacy between the subject and object of the complement clauses. The interesting cases are those for which the subject and object are both animate due to the unique meaning of the periphrastics in these cases, as will be seen in chapter 3.

[50] It is perhaps worth mentioning one final interesting syntactic quirk of the periphrastic causative verbs in English, which is that they, like some psych-verbs, allow so-called "backward binding": *The picture of himself bothered John*, *The picture of himself caused John to change the way he dresses*, and likewise for the other causatives (with the possible exception of *have*). However, this is most likely not real backward anaphora, since the reflexive is not actually an argument of the causative verb. Since the reflexive is not outranked in an argument structure list, it is not subject to the binding principles, which is probably also what is going on in the putative backward anaphoric examples with psych verbs. Such cases do seem a little more difficult when the main verb is neither a psych or causative verb (?*The picture of himself hit Bill in the head*) so perhaps the phenomenon is significant.

	Infinitive		Passive	Control/Raising		
	bare	*to*		Dummy	Idiom chunk	Pass. Paraph.
cause	✖	✔	✔	✔	✔	✔
make	✔	✖†	✔	✔	??	??
force	✖†	✔	✔	✔	??	✖
get	✖	✔	??	✔	?	✖
have	✔	✖†	✖	✖	?	✔
let	✔	%	?	✔	✔	✖
allow	%	✔	✔	??	✖	✖

Figure 10: Some syntactic properties of the periphrastic causatives in English.

The complementation patterns vary widely among the periphrastic causatives, and complementation for these verbs appears in general to be lexically idiosyncratic and historically variable. The remainder of this thesis deals only with [NP + {*to*|bare} infinitive VP] complements and, in particular, the semantics and pragmatics of these constructions, which seem to be more regular.

Chapter 3:   The Parameter of Causee Inclination

1.   Defining Causation and Identifying Periphrastic Causative Verbs

A periphrastic causative is understood here as a verb that "controls a non-finite complement clause and [whose constructions] express a causal relation in which the occurrence of the effect is entailed" (Gilquin 2010, 1).[51] The exact nature of causation, or of a "causal relation," is not entirely straightforward or easily expressible, as was demonstrated in the previous chapter, but it is here understood as a relation between an event – specifically, in the cases of most interest here, the actions of an individual directing another individual – and another event, in which the second event is counterfactually dependant on the first.

As discussed in the previous chapter, the caused eventuality entailment can be incorporated into a semantic acceptability judgment by identifying core[52] periphrastic causatives by result entailment and consequent generation of contradiction when the resultant state or event is negated:

(84)   a.   # The blast caused the boat to heel, but the boat didn't heel.
        b.   # John made Bill leave, but Bill didn't leave.

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[51] But see footnote 52.

[52] Included exceptions are the let/allow causative types with sentient patients: *She let him leave, but he didn't leave* (Wolff and Song 2003, 286).

  c. Mary begged Bob to marry her, but he didn't marry her.

<div align="right">(adapted from Wolff and Song 2003, 286)</div>

This criterion, however, does not exclude other factive verbs, such as *watch* or *notice*, and so, indeed, counterfactuality must also be included in the linguistic characterization of causation.[53]

(85) a. John caused the lamp to break, and if he hadn't done so it wouldn't have.

   b. #John saw the lamp break, and if he hadn't done so, it wouldn't have.

Based on these criteria, the causatives examined here include *cause, get, force, make, set, drive,* and *have,* plus the exceptional *let* and *allow*, which are felicitous when the result is negated in some instances, but are intuitively causal enough to nevertheless warrant inclusion. Verbs not considered, which are causative but are restricted or specialized in some way, include *persuade, convince, wreak* (havoc, destruction), *bring about, result in, give rise, lead to, induce*, and *render.* Due to the difficulties suggested above, the causal notion itself will be left undecomposed and assumed here to be primitive (while obeying the factive and counterfactual conditional heuristics). In particular, a CAUSE connective will be used as shorthand for this concept in the discussion of directive causation (described below): CAUSE(x,e) is true iff individual x is the cause of event e.[54]

  Causation as it is expressed in natural language is not uniform. In particular, English periphrastic causatives are not typically interchangeable without an

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[53] But note that, strictly, counterfactuality is a sufficient but not necessary condition on causation: while it is true that being shot caused Abraham Lincoln to die, it is clearly not true that if Abraham Lincoln had not been shot he would not have died (see also footnote 24 above for related subtleties of sufficiency and necessity). Nonetheless, it suffices to target the verbs of interest.

[54] As noted above, strictly speaking causation is a relation between events. But since the focus here is on directive causation, which is always agentive, this abbreviation simplifies the account.

alteration of meaning, even when such a substitution results in an acceptable sentence:

(86) a.   She let him mail the letter.
     b.   She got him to mail the letter.
     c.   She forced him to mail the letter.

Intuitively, these sentences are not appropriate descriptions of the same kinds of causing events. It will be argued here that the sentences in (86) – in addition to whatever other meaning differences might be present – represent points on a potential continuum with respect to how cooperative the patient is in mailing the letter, with (86a) corresponding to the most cooperative and (86c) the least. In each case, the agent "causes" the patient to mail the letter, but there is nevertheless a difference in terms of how much (perhaps patient-internal) resistance must be overcome to do so (see e.g. McCawley 1968, Beavers 2006). Whatever the characterization of the differences might be, however, it is clear that there are differences in the meaning of different periphrastic causative verbs.

In the following sections, intuitions regarding meaning differences are explored within Talmy's (1988, 2000) force-dynamic model of causation. These intuitions are further explored and refined in section 2.2 by appealing to the framework of Natural Semantic Metalanguage from Wierzbicka (1998), and finally they are interpreted in terms of the semantic parameter of causee inclination that I propose. In particular, I will argue that for animate patients, the causee's psychological and emotional disposition toward performing the caused sub-event partially determines the choice of periphrastic causative verb, and that inanimate causee constructions are parasitic on animate cases, modulo the nature of the

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disposition. Sentences in which the causee is obeying the instructions of the causer, sometimes called "directive" causation (Talmy 1976) will be the primary empirical domain of this chapter.

2. Previous Analyses

2.1 The Force Dynamic analysis of causation

In the framework of cognitive semantics, Leonard Talmy's (1988, 2000) treatment of "force dynamics" has been influential as a tool for the analysis of causation (Jackendoff 1990, Pinker 1997, Copley & Harley 2010, Wolff & Song 2003, Wolff 2007). In his presentation of conceptual force dynamics, Talmy (2000) identifies the primary conceptual-semantic elements as an agonist (causee) and antagonist (causer). Each has an intrinsic force tendency – either toward motion or rest – and there is a resulting balance of strengths, with either the causer or causee as the stronger entity. Together, these result in a force interaction outcome of either motion or rest (Talmy 2000, 414). This allows him to model not only the causative scenario in terms of physical forces, but also to similarly model the notions of prevention (which has its own inventory of periphrastic verbs, the "frustratives" such as *prevent*, *hinder,* and *inhibit*) and enablement.

According to Talmy's models, *make, force, get*, and *have* are all examples of "effectuating" causation, in which the causer exerts a more powerful force on the causee than vice-versa, resulting in motion in the direction of the intrinsic force tendency of the antagonist. The verbs *make* and *force* differ from *get* and *have* in

whether the causee's intrinsic force tendency is in the opposite direction of the causer's (for *make* and *force*) or toward rest (for *get* and *have*). The co-categorical pairs might then differ in the strength of their causee – to one plausible intuition, then, the causee of *force* is stronger than that of *make* and the causee of *get* stronger than *have*,[55] but in all cases it is ultimately weaker than the causer and therefore subject to the direction of its inherent force tendency.
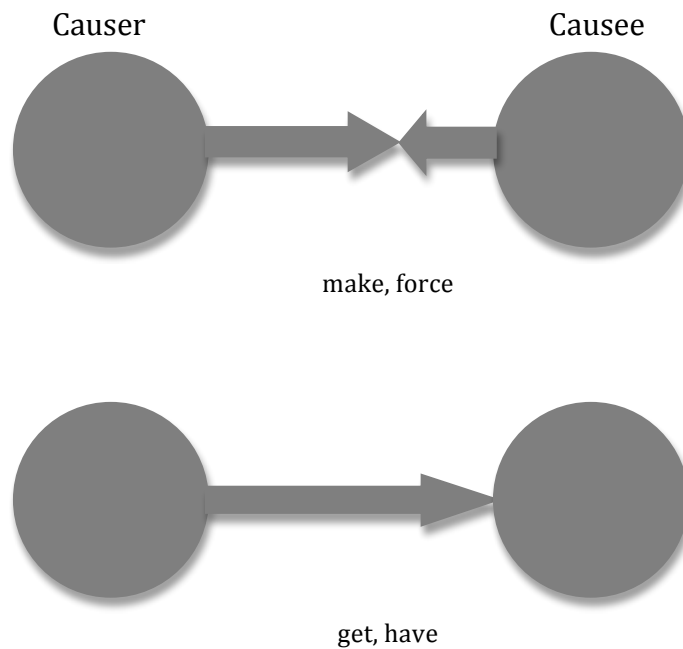
Figure 11: Illustration of Talmy's force-dynamic model for *make* & *force* versus *get* & *have*.[56]

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[55] See section 3 below for some motivation and supporting evidence for these intuitions, but ultimate challenge to their accuracy as a characterization of the different meaning of these verbs.

[56] In the force-dynamic literature, a more detailed schematic convention is used for illustration. The extra information is not directly relevant to the discussion here. In Talmy's (2000) notation, *make/force* and *get/have* would be schematized respectively as follows:

and

Contrasting with the effectuating causative verbs are the enabling causatives like *let* and *allow.* For these verbs, the causer does not necessarily exert a force on the causee, but rather removes an impediment – whether that be the causer itself or some other entity – to the causee's desired action or state. If the potential impediment is the causer itself, the causer causes by failing to impede. The distinction is illustrated by the following different depictions of a water-draining event:

(87)   a.   The piston squeezing down (made the water drain/drained the water) from the tank.
         b.   *The plug coming loose (made the water drain/drained the water) from the tank.[57]
         c.   The plug coming loose (let/allowed) the water (to) drain from the tank.

<div align="right">(Talmy 2000, 505)</div>

In (87a), an external device exerts a pressure on the patient (the water), which pushes it through the drain. Since this is an example of effectuating causation (a strong causer acting on a weaker causee), the *make* and the lexical causative patterns are appropriate. In (87b), however, the event of the plug coming loose does not represent the exertion of a force on the water, but rather the removal of a force (the seal) that was preventing the desired/intrinsic result of the patient (downward motion). This satisfies the counterfactual definition of causation – the water would not have drained from the tank if not for the loosening of the plug – but introduces an additional participant that the causer must act on to bring about the result state.

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[57] This sentence might be felicitous in the case of a poorly installed plug being identified as the cause of a water draining event, as pointed out by John Beavers (p.c.).

Although Talmy does not concentrate on such scenarios, his model might be extended to the directive case of enabling causation with human causer and causee, for which the verbs *let* and *allow* represent an authority that removes an (often unstated and social) obstacle, which frees the causee to exercise her will. These behaviors are reflected in the verbs' use:[58]

(88) a. "Let the meat rest 20 to 30 minutes after cooking to let the juices
         settle in the meat."   (Washington Post 1990)
     b. "Please let me stay. I'll behave. No profanity. I swear."
                                                                 (Esquire, 1998)
     c. "I let my kids decorate their rooms any way they want."
                                                                (Parenting, 1999)

In (88a), there are two instances of *let*, each with an inanimate object. In each case, the complement of the verb describes the natural tendency of the patient – if undisturbed, meat will "rest" and juices will "settle" – so *let* seems to mean "remove (or don't create) any obstacles." In (88b), the speaker is pleading for the addressee to remove what is likely a force, probably implied, toward his or her removal, and in (88c) a parent describes the removal or non-enforcement of what might otherwise be considered a normatively default rule governing child behavior. In each case, the cause is an instance of removal of (or non-creation on the part of an authority to create) an impediment on – to use force-dynamic terminology – the "agonist's intrinsic force." Social causation of this type, in which the causee is human, is the focus of Wierzbicka's (e.g. 1998) approach to periphrastic causative verbs, which is the subject of the next section.

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[58] All collocation data and example sentences where not otherwise cited are from the Corpus of Contemporary American English (COCA), maintained by Mark Davies at Brigham Young University.

Although Talmy's framework is attractive in its simplicity and flexibility, it fails to account for all – or even what are arguably the most interesting and important – of the meaning differences between the periphrastic causatives. For example, according to Talmy's model, both *get* and *have* are appropriate in causative events in which the causer overcomes the causee's intrinsic force tendency toward rest. However, these verbs are not synonymous, as demonstrated in the difference in acceptability of the sentences below:

(89) a. The police got the protesters to disperse by meeting their demands.

   b. ??The police had the protesters disperse by meeting their demands.

In both sentences, the intrinsic force tendency of the causee (protesters) is toward rest and they are opposed by the force tendency of the causer (the police), but nothing in the force-dynamic system explains why (89a) is felicitous, and (89b) is not. To account for these differences, the desires and motivations of the causee must be represented. The Natural Semantic Metalanguage approach of Wierzbicka (e.g. 1998) is one attempt to represent these kinds of meaning distinctions.

2.2 Wierzbicka's (1998) analysis of English periphrastic causative verbs

2.2.1 Introduction

Wierzbicka (1998) models the differences between the effectuating causative verbs *have, get, make,* and *force* in terms of short lists detailing the conditions and role bearer attitudes that she claims make each verb felicitous in context. Her

approach is lexically idiosyncratic and, in general, she rejects the notion that there exist *a priori* or otherwise extra-linguistic types of causation that are represented by the English periphrastic causatives (Wierzbicka 1998, 117). In this section, I posit some preliminary descriptive observations and provide corpus sentence examples to introduce and motivate her Natural Semantic Metalanguage approach to the particular verbs of interest here, beginning with causative *have.*[59]

2.2.2   *Have*

The causative verb *have*, as in (86a) above, *She had him mail the letter*, seems to occur most felicitously with animate, agentive patients. In the cases for which it does not, as for sentences containing passive participles like *he had his car fixed*, an unexpressed agent who did the action leading to the state expressed is understood. The verb does not select for an animate or animate-like patient if it is conceived as non-agentive or somehow unwilling:

(90)   a.   ?? She had the cat drink the milk

        b.   ?? He had the washing machine wash the clothes.

Wierzbicka recognizes this feature of causative *have* and claims that use of the verb suggests a hierarchical relationship, but not one in which the causer has unlimited power over the causee, but rather the causee is "a cooperative performer of the

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[59] I should note that, although I do not have any major disagreements with Wierzbicka's semantic intuitions, except for those regarding the verb *make*, I believe the periphrastics are much less idiosyncratic than she suggests, as will be explicated below.

causer's will" (Wierzbicka 1998, 121).[60] She represents the *have* predicate with the following scenario outline:

(91) *Person X had Person Y do Z =*
    a.   X wanted Z to happen (to W)
    b.   because of this X wanted Y to do Z (to W)
    c.   because of this, X said something to someone
    d.   because of this Y did Z
    e.   X could think that when X says something like this (about something like this) Y can't say: "I don't want to do this"

                               (Wierzbicka 1998, 120)

The cooperative nature of the causee in performing the causer's will, in combination with the lack of explicit causee desire with respect to the performed event is an important component of the meaning of this verb, as will be discussed below.

2.2.3   *Get*

The causative verb *get*, on the other hand, suggests cooperation of a less enthusiastic sort, at least initially. Like *have*, when *get* occurs with a human patient it signals compliance, but does not require that the patient be interested specifically in performing the causer's will. Similarly, there is no necessary power or authority that the causer has over the causee; rather the causer must do something that somehow influences the causee's desires and behavior. In general, since the causee must be made to want to do whatever is caused, the requirement that the causer simply wants the causee to do something is insufficient for *get* causation. This is presumably the reason for the manipulative tone that often accompanies these constructions, as in a sentence like *he cleverly got the suspect to admit his*

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[60] For a pragmatic account of similar phenomena, see McCawley (1968)

involvement in the crime. Get can also take nonhuman complements, as in *I got the cat to drink the milk,* with the implication that the agent did something to make the animal want to, or otherwise be willing to, perform the desired action. With *get*, the patient has the right of refusal and is operating according to its own will. Sentences in the corpus are consistent with these intuitions, as the examples in (141) suggest:

(92) a. "…that's the best way to get them to come forward."
                                                            (CNN – AM, 2006)
      b. "…a number of us have been trying for years to get the government to recognize it."   (PBS Newshour, 1990)

Wierzbicka represents the behavior of *get* as follows:

(93) *Person X got person Y to do Z =*
      a. X wanted Y to do Z
      b. X knew that if Y didn't want to do it Y would not do it
      c. X thought that if Y wanted to do it Y would do it
      d. because of this X did (said) something to Y
      e. because of this after this Y wanted to do Z
      f. because of this Y did Z
      g. because of this X could think: "I wanted something to happen. It happened"   (Wierzbicka 1998, 124)

The cases for which the patient is inanimate, as in the examples below, likely represent a metaphoric extension of this scenario – or, as will be argued, involving a different kind of "wanting".

(94) a. I got the sauce to thicken
                                        (Wierzbicka 1998, 123)
      b. I got the car running

In most such cases, the patient, though inanimate, is conceived as having some volitional property, and in particular a stubbornness, which must be manipulated or

overcome.[61]   This is reflected in the oddness of *get* when it occurs outside of a

context of effort or resistance, as in context-neutral ?*I got the book open.*[62]

2.2.4   Force

Force encodes direct compulsion. The patient of a *force* causative is non-

cooperative, but has no right of refusal, and causation is typically direct. In the case

of inanimate patients, the distinction is again highlighted when compared to the

lexical causative:

(95)   a.   Bill opened the door.
        b.   Bill forced the door open.

In (95b), there is an implication of resistance that is not present for (95a): #*Bill*

forced the door, which easily relented, open. The pattern is extended for animate

patients, for whom the resistance is often internal – emotional or cognitive.

(96)   a.   "…dry leaves will inevitably lead to huge fires, forcing displacement of
              deer, elk, and upland birds…"   (FieldStream, 2007)
        b.   "…a new military campaign to force Muslims from their homes and
              villages…"   (ABC_Jennings, 1993)
        c.   "The court forced the district to integrate."   (DenverNews, 2010)

The resistance of the causee is likewise represented in Wierzbicka's explication:

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[61] A possible exception is the idiom *get the ball rolling*, for which resistance is not obvious. Part of
the meaning of this idiom plausibly relies on a relative difficulty of overcoming inertia in initiating
some process, which would accord with the generalization given, but this is not straightforward.

[62] There is a usage of *get* that occurs in sentences like *I just need to get my shoes on and I'll be ready to
go*. These present a challenge for the generalization made here. One possible analysis of these
usages might claim that in sentences of this type something (a task) is preventing or delaying a
desired outcome, which might then invest the task with a sort of figurative resistance and thereby
make *get* felicitous, but the details of such a proposal are not yet clear to me. Thanks to Steve
Wechsler (p.c.) for pointing out these constructions.

(97) *Person X forced person Y to do Z (e.g. to apologize). =*
    a.   X wanted Y to do Z
    b.   X knew that Y didn't want to do Z
    c.   X thought that if X did something to Y, Y would have to do Z
    d.   because of this X did something to Y
    e.   because of this Y had to do Z
    f.   because of this Y did Z
    g.   Y wouldn't have done Z if X had not done this to Y
    h.   when Y was doing Z, Y thought: "I don't want to do this"

<div align="right">(Wierzbicka 1998, 141)</div>

The desire of the causee, unlike in the case of *have*, is an explicit component of the meaning of *force.*

2.2.5   *Make*

According to Wierzbicka, there are several distinctive uses of the verb *make*, differing both in terms of verb complement and subject properties. Typical corpus sentences containing causative *make* and animate patients include the following:

(98) a.   "When they were far enough away not to make the strange horses
          nervous…"[63]   (Analog, 2000)
     b.   "I wanted to make her feel better."   (US Catholic, 1998)

Common to sentences of this type is the emotional or otherwise cognitive nature of the caused event or state.   For these *make* constructions, Wierzbicka offers the following explication:

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[63] Although here the collocate *nervous* is an adjective rather than a verb, and adjectival collocates were not collected for causative verbs in this study, the generalization that animate complements of *make* select for cognitive features, discussed below, seems to hold for this example. In any case, I presume the relevant details are consistent with an elided verb *feel* preceding the adjective.

(99)   *Person X made person Y think/feel/want something =*
        a.   X did something
        b.   because of this Y thought something
        (b'   because if this Y felt something)
        (b''   because of this Y wanted something)
        c.   Y wouldn't have thought/felt/wanted this if X had not done this
                                        (Wierzbicka 1998, 130-134)

Another *make* causation construction type is that for which the verb *do* or another

action verb occurs in the complement clause:

(100)   a.   "I'll make you dig the most."   (Bk: Salem Falls, 2002)
        b.   "It may make him pay for the actual harm caused by…"
                                        (EnvirAffairs, 1998)

For these sentences, which I will call "make do" constructions, there is a coercive

reading resulting from a power differential, which Wierzbicka represents as in

(101):

(101)   *Person X made person Y do Z =*
        a.   X wanted Y to do Z
        b.   Y knew this
        c.   X knew that if X didn't do something to Y, Y wouldn't do Z"
        d.   because of this X did (said) something to Y
        e.   because of this, Y thought "I have to do it"
        f.   because of this Y did Z
        g.   Y wouldn't have done Z (at that time) if Y had not thought this
                                        (Wierzbicka 1998, 136)

For the "make do" pattern, the right of refusal present in *get* is absent or diminished.

Substitution of *make* in a sentence like *I tried to get him to do it, but he refused* – ?*I*

tried to make him do it, but he refused – is less felicitous.

        The causer of a "make do" construction need not be agentive. Non-agentive

causers occur in sentences like the following:

(102)   a.   The weather made us cancel the event.
        b.   The noise made the guests leave.

These kinds of scenarios are directly analogous to that depicted in (101), absent

only the will of a causer:

(103) *Something (X) made person Y do Z =*
    a.   person Y was in place P
    b.   something (X) happened in P (e.g. it started to rain)
    c.   because of this Y thought: "I have to do something"
    d.   because of this Y did Z (go inside)
    e.   Y wouldn't have done Z if X had not happened
                                          (Wierzbicka 1998, 138)

Finally, the object of a *make* periphrastic causative need not be animate. The

significant meaning component in these sentences is made salient when compared

to lexical causatives:

(104) a.   Henry shattered the window.
        b.   Henry made the window shatter.

Example (104b), in contrast with (104a), indicates indirect causation, as discussed

in chapter 2. While (104a) could describe a scenario in which Henry punched and

broke a window, (104b) would be dispreferred in such a context. "Make do"

causatives of this kind are most felicitous when something happens due to some

action, but nothing is done directly to the patient, with an oftentimes-unexpected

result:

(105) *Person X made Z happen to thing Y (e.g., open, go off)*
    a.   X did something
    b.   because of this something (Z) happened to thing Y
    c.   Z wouldn't have happened to Y if X had not done this
    d.   X didn't do anything to Y
    e.   because of this people could think that Z would not happen to Y
                                        (Wierzbicka 1998, 147)

This, however, does not seem to be the whole story as concerns the "make

do" causative construction, as revealed by corpus examples. The causative is also

felicitous when the means of causation are unknown or otherwise unexpressed:

(106) "Who can make the disc soar highest, furthest, or longest?"

<div align="right">(ChildDigest, 1998)</div>

Contra (105), (106) is appropriate even when the agent acts directly on the disc. In fact, (106) seems to be appropriate for nearly any kind of effectuating causal interaction. Although *make* typically signals a less direct causative event than do other ways of expressing causation, such as lexical or morphological causatives, that is a general feature of periphrastics and is common to all the verbs treated in this section, as discussed in the previous chapter. If these explications are taken together, then, the periphrastic causative *make* requires the internal (if animate) (99), coercive (101), indirect (105), or unspecified (106) compulsion of a patient. When it is expressed in this way, it is difficult to envision an effectuating causative scenario for which *make* would be obviously inappropriate. It is consequently tempting to treat *make* as a general causative. Despite this temptation, there is some evidence for polysemy:

(107)   ??John made Mary happy and Bill leave.

There is a zeugma effect for (107), which is typically the result of mixing senses. This suggests that there are at least separate entries corresponding to adjectival and verbal predicates of the small clause,[64] lending some plausibility to Weirzbicka's multiplicity of explications. Among the directive effectuating periphrastic causatives, in any case, *make* seems to be the least marked of the set and is probably best treated as a general causative in that domain. Furthermore, although the point will not be argued in detail here, this verb will be treated as a general effectuating

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[64] Perhaps the different senses are better characterized semantically than syntactically: ?*John made Mary feel better and Bill go home.* Although this sentence might be better than (26), there is possibly also a zeugma effect here.

causative even beyond the directive domain (with some noted exceptions and complications) below and in the next chapter.

A more serious complaint than the lack of empirical coverage for *make* is with the Natural Semantic Metalanguage approach to the periphrastic causatives in general, and what that approach suggests about the structure (or lack of structure) of their meaning differences. Despite the intuitive appeal and initial plausibility of Wierzbicka's approach to the meaning of the periphrastic causative verbs, there is some evidence that these verbs can be differentiated from one another more systematically, without stipulating *ad hoc* explications. In particular, the degree of resistance on the part of the causee – or, conversely, that of causee inclination – appears to predict the choice of periphrastic causative verb without necessitating the more cumbersome and lexically idiosyncratic Natural Semantic Metalanguage scripts outlined above. This can be seen most clearly in the cases for which the causee is animate, although it can in principle be extended to the general case.

2.3 Summary

Talmy's analysis of the periphrastics causatives distinguishing the enabling causatives, for which the intrinsic force tendency of the causee (antagonist) is in the same direction of the causer (agonist), from the effectuating causatives. Among the effectuating causatives, causatives for which the causee's intrinsic force tendency is

toward rest are distinguished from those for which the intrinsic force tendency opposes that of the causer. This approach is summarized in the table below:

	Enabling	Effectuating	Opposed Causee
Let	+	-	-
Allow	+	-	-
Get	-	+	-
Have	-	+	-
Force	-	+	+
Make	-	+	+

Table 1: Force-dynamic characterization of the periphrastic causative verbs.

Wierzbicka treats the causative verbs as lexically idiosyncratic and, as such, does not distinguish them in terms of features or paradigms. Despite this, the description of the verbs can be distilled into a number of distinguishing properties based on the causee's right of refusal, the particular form of causing action on the part of the causer, and the desires of the causee. One possible characterization is given below:

	Distinguishing properties
Get	Causee has right of refusal, Causer does or says something to make causee want to perform sub-event.
Have	Causee has no right of refusal, Causer says something to make causee perform sub-event
Force	Causee does not want to perform caused sub-event, Causer does something to causee which results in causee having to perform the sub-event
Make 1	Causer does something that makes causee think/feel/want something
Make 2	Causer does or says something that makes causee feel that causee has to perform sub-event
Make 3	Something happens that makes causee feel that he/she has to perform sub-event
Make 4	Causer does something that makes something happen to causee

Figure 12: Summary of main features of the Natural Semantic Metalanguage characterization of the periphrastic causatives.

In the following section, a more streamlined and predictive treatment of these verbs will be proposed.

3.   Patient Inclination as a Feature of Periphrastic Causative Verbs

3.1   The inclination continuum

A feature that enriches the force-dynamic approach and allows for the systemization of the intuitions behind the Natural Semantic Metalanguage divisions of the periphrastic causative verbs in English is that of patient inclination. This is related to a property that Wierzbicka notes in her explication for *force*: "when X was doing Z, Y thought 'I don't want to do this'" (97h). By "inclination," what is meant here is one particular variety of a disposition, or a default tendency of the causee:

what the causee would do or experience absent interference or impediment. In this way, inclination is the social variant of an abstraction of Talmy's forces, which are themselves essentially physical dispositions:

```
              Disposition
               /      \
         Physical    Social
            |           |
          forces    inclination
```
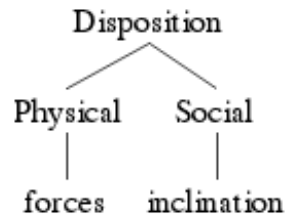
In the case of directive causation, inclination manifests as the willingness and eagerness – sometimes expressed as the degree of hesitation or apprehension, as discussed below – with which the causee performs or participates in the caused event or state. These notions – willingness, eagerness, hesitation, apprehension – do not define inclination, but they are all more salient and measurable symptoms of preference over the performance of or participation in some eventuality, which does define it:

(108)   **Definition**:
          Inclination is a scalar measure of the disposition of the patient in a
          directive causative event, measuring the relative evaluative stance
          toward the performance of the caused subevent.

The linguistic consequences of inclination and other varieties of dispositions are discussed in the following sections.

Inclination is a gradable concept that may admit of borderline cases for which judgments regarding the felicity of certain causatives can vary. Nevertheless, there exist clear cases and distinctions that can be made in terms of inclination that reliably predict the behavior of the causative verbs examined here. By treating inclination as Boolean, in fact – with values at polar extremes of the scale – the

meaning differences among the four primary directive periphrastic causative verbs can be parameterized. In this section, inclination is motivated and described in terms of its relevance to the periphrastics and it is shown that, in at least one possible typology, the primary directive periphrastic causative verbs exhaust the logical possibilities of this parameter. Evidence will include relative felicity under embedding by certain clausal complements which seem to track evaluative stance toward some future event (*fear* and *hope*), modification of the caused event targeting hesitation or resistance (*despite his reluctance*) and modification of its head by inclinational adverbs (*eagerly* and *grudgingly*), and the choice of the causee, extending the discussion somewhat beyond directive causation to inanimate causees. Evaluation methodology includes both traditional acceptability judgments and corpus data, beginning with the former.

To motivate the discussion of inclination and its effect on the periphrastic causatives examined here, it is useful to look at the most salient division among the verbs discussed here in terms of that parameter: the "enabling" and "effectuating" causatives (see, e.g. Talmy 2000), as introduced in section 2.1 above. The enabling periphrastic causatives include *let, allow,* and of course *enable.* These verbs are used when the causee removes or fails to erect an obstacle to the prior inclination of the causee. In the case of animate causees, this suggests an authority or power differential between causer and causee:

(109) a. "Please let me stay. I'll behave. No profanity. I swear."

(Esquire, 1998)

b. "I let my kids decorate their rooms any way they want."

(Parenting, 1999)

The causative events described by the sentences in (109) can be satisfied by the causer failing to perform any action whatsoever.[65]   In contrast, the effectuating causatives require positive action on the part of the causer. For the latter verbs, the caused event is not in alignment – and in some cases, is in dis-alignment – with the causee's inclination.

Further distinctions can be made among the effectuating causatives using more traditional terminology that can then ground a discussion in terms of inclination. Among these effectuating causatives (the periphrastics other than *let* and *allow*), a distinction can be made between causation that involves the manipulation of a causee's will (coercive causation) and the exercise of authority or force (compulsive causation), for which the causee's will is either irrelevant or explicitly opposed. Effectuating causatives include *get, have, make, drive,* and *force*. Among these, *get* is the clearest exemplar of coercive causation. For *get*-causation, the causee must in some sense be a willing participant in the action, and it is this willingness that the causer effectuates. This is most apparent when the caused state involves the causee's desire itself:

(110) a.   John got/??drove[66]/#allowed/#forced Bill to want to do it.

   b.   John #let/#had Bill want to do it.[67]

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[65] In fact, due to the presence of the free choice quantifier *any* in (109b), even the causee need not do anything to satisfy this sentence. This illustrates the exceptional nature of causatives *let* and *allow* with respect to the definition of causation requiring entailment of the caused subevent. See footnote 52.

[66] Verb phrases like *drove him to want to succeed* are felicitous. The participle *driven*, which idiomatically means something like "ambitious" when applied to people, seems to be part of what makes these sentences possible. There are also many Google examples from fiction describing romantic passion for which the causee seems to be swept away or otherwise not in control: …*drove him to want to possess/conquer her*, etc. These constructions are not inconsistent with the account given here, but a detailed analysis is left to future research.

For coercive causation, then, it is the will that is being acted upon by the causer. This "will", it will be seen, is more fruitfully thought of the patient's inclinational status. A summary of the characterization of the periphrastic causatives thus far is given below:

	Enabling	Effectuating	Compulsive	Coercive
Let	+	-	-	-
Get	-	+	-	+
Have	-	+	-	-
Force	-	+	+	-

Table 2: Preliminary and partial analysis of periphrastic causatives.

It is argued below that these divisions can be simplified and their differences can be subsumed under the notion of patient inclination. Reliable tests for this notion are somewhat difficult to construct, however. As a first approximation, the notions of patient desire, apprehension, and willful opposition offer landmarks along an inclinational scale, but there are several complications that will be outlined and, to the extent possible, met below.

3.2   Embedding contexts for inclined and resistant causation

In the case of enabling causatives, animate causees appear to be eager and non-apprehensive, which manifests in felicitous embeddings under *hope* and infelicitous embeddings under *fear:*

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[67] Note that *make* is felicitous in this construction. This verb will be discussed in more detail below.

(111) a. Bill hoped Mary would let him do it.

  b. # Bill feared Mary would let him do it.

The verbs *hope* and *fear* indicate, respectively, positive and negative sentiment toward an anticipated future eventuality. As such, in most cases they track eagerness or resistance regarding that eventuality, insofar as individuals will typically be eager to perform an action toward which they have positive sentiment and resistant in the performance of negative events. The proposed reason for the eagerness and non-apprehension as reflected in the judgments with *hope* and *fear* above is that causee of *let* is an inclined patient, which means that *let* represents one extreme on the inclinational scale:

(112) **Definition:**
An *inclined* causee prefers performing or participating in an eventuality to not performing it. An *inclined* periphrastic causative verb is a verb whose use presupposes an inclined causee.

That sentences embedded under *hope* are compatible – and those embedded under *fear* incompatible – with an agent who in general prefers performing an event to not performing it can be seen in sentences that do not include a periphrastic causative verb:

(113) a. Bill hoped he would win the race.

  b. # Bill feared he would win the race.

Barring some conflicted feelings about winning the race (see discussion below) and assuming Bill prefers winning to losing, *(Bill) will win the race* is incompatible with *fear*. None of the other periphrastic causative verbs examined here show the same

behavior with *hope* and *fear*. They are either felicitous (in the case of *have*) or marginally felicitous (as for *get*) in either construction, or anomalous for *hope* and felicitous for *fear* (*force*).[68]

At the other extreme, force-causation involves causees that are apprehensive, and non-eager:

(114) a.　# Bill hoped Mary would force him to do it.
　　 b.　 Bill feared Mary would force him to do it.

The causee of *force* is a resistant patient.

(115) **Definition:**
A *resistant* causee prefers not performing or participating in an eventuality to performing it. A *resistant* periphrastic causative verb is a verb whose use presupposes a resistant causee.

In general, *hope* is incompatible, and *fear* compatible, with dispreference:

(116) a.　# Bill hoped he would step on a tack.
　　 b.　 Bill feared he would step on a tack.

Except in the case of a truly bizarre preference structure, *(Bill) will step on a tack* cannot be embedded under *hope*.

The inclinational relationships targeted by *hope* and *fear* are complicated when an individual can act (and importantly, be cognitively and emotionally inclined; in other words, to feel) in opposition to himself, i.e. when a causee has conflicting desires. For example, in the case of someone with a history of avoiding exercise but a desire to reap its benefits, a sentence like (117a) might be entirely appropriate, and (117b) has a perfectly felicitous reading:

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[68] These tests – as well as complications and subtleties of interpretation – are discussed in more detail below.

(117) a.   Bill hoped his personal trainer would force him to work out.

      b.   Bill feared his advisor would let him procrastinate.

In both (117a) and (117b), Bill's inclinations at one time are at odds with his inclinations at a different time, allowing for non-anomalous mixtures of *let* with apprehension and *force* with eagerness. These scenarios – in which an individual's will is divided – are at the root of many of the subtleties of interpretation for the periphrastic causative verbs.

A distinction can be made between periphrastic causatives for which the patient is inclined and those for which the patient is not inclined. Inclination, as an indicator of preference, as defined in (108), consequently also measures the willingness and eagerness on the part of the causee to perform or participate in the caused eventuality. An inclined patient, insofar as he prefers performing the action to not performing it, is one who is not only willing, but is internally free from hesitation or apprehension. Specifically, a person can be willing to do something even if he is apprehensive or not particularly happy to do so. Most responsible people experience that state of affairs often, in fact. That person would not be an inclined causee in a causing event. The inclined periphrastics include *let,* and, as suggested by (118b), *get.* The periphrastics whose patients are not inclined are compatible with apprehension, as demonstrated in object control constructions with *fear*, as discussed in the preceding paragraph and subject to the complications outlined there:

(118) a.   # Bill feared Mary would let him do it.
      b.   # Bill feared Mary would get him to do it.
      c.   Bill feared Mary would have him do it.
      d.   Bill feared Mary would force him to do it.

As suggested above, there are some complications with these judgments having to do with the possibility that a person can be at odds with himself or his own inclinations. For example, if Bill knows that he is easily manipulated to forget his better judgment and willingly do things he wouldn't do with more reflection, (118b) might be appropriate. Importantly, this case involves a situation for which the patient is conceived as having more than one will, which can be in opposition to one another.[69] In other words, judgments regarding the periphrastics become unstable when the will – and consequent inclination – of the patient can vary or bifurcate. This is predicted by the analysis presented here. Crucially in such cases, there is at least one will that is not contradictory with the desire for or against performing the event under *hope* and *fear*, respectively, allowing felicity. A causee that is conflicted is, in some sense, neither inclined nor resistant.

A further distinction can be made between patients that are resistant and those that are not resistant, which, since inclination is scalar, is not the same as inclined. Causatives whose patients are resistant represent causation in opposition to the desires and preferences of the causee, as defined in (115), and are therefore incompatible with the object control verb *hope*:

(119) a.   Bill hoped John would let him do it.
      b.   #Bill hoped John would get him to do it.
      c.   Bill hoped John would have him do it.
      d.   #Bill hoped John would force him to do it.[70]

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[69] Note also that there is a sense of *get* that means something like "select", for which (32b) is felicitous. For example, Mary is choosing among several candidates to perform a task and chooses Bill. This sense of *get* seems to be focus-sensitive and is the preferred reading when stress is on *him* in (118b) (John Beavers, p.c.).

[70] There is a use of force in which the causation is not necessarily over the desires of the causee, but rather the causee's decision to do something is compelled by the removal of other live options. For

Similar caveats apply to these sentences regarding variation and bifurcation of will as those that were outlined in the *fear* constructions mentioned above. In particular, if there is a split will, then there is no clear preference relation between performing and not performing an event, so the patient is both not inclined and not resistant and therefore neither an embedding under *hope* nor an embedding under *fear* is blocked.

These embeddings provide a four-way distinction among the periphrastic causatives, summarized in the table below:

	hope	*fear*
Let	+	-
Get	-	-
Have	+	+
Force	-	+

Table 3: compatibility of periphrastic constructions under embeddings.

The following section provides more evidence for these distinctions via the behavior of the periphrastic constructions under modification of the caused subevent.

3.3 *Get* and the modification of Inclined and Resistant caused eventualities

Just as non-resistant patients are incompatible with embeddings under *fear*, periphrastic constructions whose patients are not resistant result in semantic anomaly in sentences containing *despite his/her reluctance* modifying the caused

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example, a closed road can force someone to take an alternate route. Although this use is common, it does not seem to be a preferred reading of directive *force*.

subevent. Reluctance, like fear, is a consequence of dis-preference, and therefore is disallowed with non-resistant causees:

(120) a.   # Mary let Bill do it despite his reluctance.
     b.   Mary got Bill to do it despite his reluctance.
     c.   # Mary had Bill do it despite his reluctance.
     d.   Mary forced Bill to do it despite his reluctance.

These judgments are subject to problems depending on when the modifier is interpreted to hold, as in the case when the modifier (120b) is contemporaneous with the caused event rather than with (or before) the causing event. This difficulty disappears, however, when the reluctance is specified as prior to the causing event and suggested to have been assuaged:

(121)   Bill was initially/#ultimately reluctant to do it, but Mary (eventually) got him to.

Indeed, the verb *get* appears to include a temporal component that is not necessarily present in the other periphrastics – it encodes a transition from a resistant to an inclined causee. For that reason, it can be represented as being both inclined and resistant at one time or another. It is possible that an individual can fear manipulation, but nonetheless willfully and even eagerly engage in some eventuality when manipulation is complete. With the introduction of the temporal component and manipulation of the will, complexities abound. Examples such as cognitive predicates – which seem to exist on the border between willed and unwilled – and manipulation into performing illicit activities further illustrate this possibility:

(122) a.   ? Bill hoped John would get him to understand.

     b.   Bill feared John would get him to commit the crime.

For *get*, it is inclination itself that is the target of the causative event. The causer

seeks to make the causee inclined or not resistant.

The dynamic character of *get* also results in complications in cases of

modification of the head verb of the caused subevent. These complications, like

those for (120) above, are contingent on when the modification is interpreted to

hold. In particular, the adverbs *eagerly* and *grudgingly* seem to specifically target

inclined and resistant agents, respectively, of a verb that they modify. In particular

for periphrastic constructions, *eagerly* is felicitous in the complement of inclined

causatives (123) and *grudgingly* in the complement of resistant causatives (124).

Note that these adverbs should be read in the low-scope position, as depicting Bill's

state of mind, not Mary's:

(123) a.   John let Bill do it eagerly.
          b.   John got Bill to do it eagerly.
          c.   # John had Bill do it eagerly.[71]
          d.   # John forced Bill to do it eagerly.

(124) a.   # John let Bill do it grudgingly.
          b.   ?John got Bill to do it grudgingly.
          c.   # John had Bill do it grudgingly.
          d.   John forced Bill to do it grudgingly.

Sentence (124b) has a salient reading in which *grudgingly* is not interpreted as

contemporaneous with the verb it modifies, *do*, but instead refers to the evaluative

stance of the verb's agent, Bill, at some other time prior to the causing event.

Assuming this use is felicitous, this gives another four way contrast, analogous to

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[71] This sentence, as well as the example with *force* is felicitous if, e.g. John is Bill's boss and the appearance of eagerness is part of the job responsibility. In fact, all of these sentences are felicitous, including all of those in (124), if eagerness/grudging is read as being part of what is caused/allowed.

that generated by the embedding behavior, differing only in that these adverbs seem to locate the presence of either inclined or resistant causation, rather than its absence, as illustrated by the reversal of values for *get* and *have* as compared to the embedding typology:

	eagerly	*grudgingly*
Let	+	-
Get	+	+
Have	-	-
Force	-	+

Table 4: compatibility of periphrastic caused sub-events with adverbial modification.

Like *get*, *have* too displays some interesting inclinational properties, which is revealed by the choice of causee DP/NP in the complement clause of the periphrastic causative. Causee selection is the subject of the following section.

3.4   *Have* and the consequences of causee selection

For *have*, while full inclination in terms of preference – resulting in freedom from internal hesitance – is not required, lack of resistance – in terms of willful opposition reflecting dispreference as defined in (115) – seems to be taken for granted. This requires a causee that is capable of suspending his will to perform the will of the causer. The conditions for such a suspension are usually socially complex and are exemplified in the employee/employer contractual relationship. This places an animacy constraint, and in most cases a human constraint, on the causee

argument.[72] It seems that it is only in training contexts, for which the causee can operate as a relatively unmediated performer of the causee's will, is the human requirement relaxed:

(125) a.   The executive had the secretary mail the letter.
       b.   ??John had the cat drink the milk.
       c.   Over many months, John trained his dog to automatically drink from his water dish on command. To show off the feat, John had the dog drink the water in front of guests.

To be the causee in *have*-causation, an entity must be capable of being an unmediated agent of the causee's will.[73] Perhaps even the animacy requirement can be relaxed in cases where the causee is conceived as such[74] (126), but it is clear that the will of the patient is subjugated to that of the causer for *have* (127).

(126)   The programmer had the robot introduce itself.

(127)   The hypnotist had the man cluck like a chicken.

In this way, conversely to the way in which causees of *get* are – at different times – both resistant and inclined, those of *have* are neither resistant nor inclined. To stretch the terminology somewhat, if the patients of verbs like *let* are clearly inclined and those for *force* are resistant, they might best be considered "un-inclined" for *have* (unmarked for inclination or resistance) and "trans-inclined" for *get* (representing a transition from resistant to inclined).

The requirements that an inclinational profile of *have* puts on a patient requires the willful suspension of – at least the display or expression of –

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[72] Note that, since the focus here is on directive causation, all of the relevant sentences examined here have an animacy contraint, but only *have* lacks another usage or sense that allows inanimate causees (except the special usages discussed below).

[73] This feature of *have* makes it a directive causative *par excellence* and is sometimes used to exemplify that causative situation type (Shibatani 1976)

[74] A director can have a lamp break in the third act, for example (Heidi Harley, p.c.). In this scenario, the entire environment is subject to the will of the causer.

inclinational stance.[75] This is usually impossible for non-human animate causees,

but the possibility of a training scenario as in (125c) and other suspensions of will

as in (126) invite the question of whether the animacy requirement can be relaxed

in certain environments of total control even if the causee is not conceived as

animate or under the unmediated control of the causer. Indeed:

(128)   The director had the car explode ten minutes into the chase.

This example still seems to be an instance of directive causation insofar as the

director is presumably not personally manipulating the car, but rather ordering (or

directing) others to do so. The (implicit) causee of the causative verb must be a

volitional agent. The parameter of volition, in fact, seems to track inclination in the

case of directive causation.

The notion of inclination is related to the parameter of volition in that they

are both measures of the will. While the scale that the directive periphrastic

causatives are sensitive to is inclination, as argued, volition is often easier to track

and can perhaps sometimes serve as a diagnostic indicator for the property of

interest. Although volition is grammatically marked in some languages, that is not

the case in English. Nevertheless, there do exist predicates in English for which

volitionality is lexically encoded, as well as adverbs that specify volitional status.

For highly volitional verbs, like *believe*, only causatives with inclined patients seem

to be felicitous:[76]

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[75] Note that, in strict adherence to the definitions above, while a causee of a *have* event might in fact
have some inclinational stance, the use of *have* makes no such presupposition.

[76] There seems to be an interaction here with stativity, as well, as can be seen by the felicity for all
verbs when *believe it* is replaced by *murder Felix* (John Beavers, p.c.). See below for clearer evidence
that the volitionality of these verbs differ.

(129) a.   John let Bill believe it.
       b.   John got Bill to believe it.
       c.   #John had Bill believe it.
       d.   #John forced Bill to believe it.

Inclination is not the same as volitionality, however. In particular, none of the causatives are felicitous in non-volitional sentences (130), while all (with the possible exception of *force*) are appropriate when volition is made explicit (131):[77]

(130) a.   # John let Bill inadvertently/accidently do it.
       b.   ??John got Bill to inadvertently/accidently do it.
       c.   # John had Bill inadvertently/accidently do it.
       d.   ??John forced Bill to inadvertently/accidently do it.

(131) a.   John let Bill purposefully/intentionally do it.
       b.   John got Bill to purposefully/intentionally do it.
       c.   John had Bill purposefully/intentionally do it.
       d.   ?John forced Bill to purposefully/intentionally do it.

It is clear from these examples that volitionality is not a deterministic parameter for the selection of periphrastic causative verb. Rather, the periphrastic causative verbs are sensitive to a finer-grained notion – that of relative resistance versus eagerness – which is what has been referred to here as "inclination" and discussed above. In the following sections, however, it will be observed that volitional predicates sometimes track inclination in measurable ways, vindicating acceptability judgments like those in (129).

    For sentences with an inanimate syntactic causee like (128), then, there still exists some unexpressed causee or causees capable of performing the causer's own

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[77] There is apparently speaker variation regarding the judgment for (130a), but to my intuition this sentence is clearly infelicitous as long as causation is interpreted as being strictly directive. The situation in which you see someone about to accidently step into an open manhole cover and you "let" them do so by not warning them, for example, is not a directive causing event. The crucial notion for a directive *let* causative is that of permission.

will and further capable of suspending their own. As is the case of (125a), the disposition targeted by the choice of periphrastic causative verb is still that of inclination. Or, more precisely, lack of inclination. For other felicitous uses of periphrastic causatives with inanimate causees, however, there is no covert animate agent to perform the caused action, and instead the causer must in some way manipulate the causee, which relaxes requirements on causee selection. These are no longer directive causative scenarios, but manipulative ones, and the relevant parameter for the selection of a periphrastic verb is no longer that of inclination, but some other variety of disposition.

In the case of manipulative causation, it is likely that the relevant disposition is just inherent direction of motion (or rest) as dictated by relevant physical forces (or, to be less blatantly circular as a description of causation, relevant physical fields as described functional-dependently by field equations), whether that be gravitational, magnetic, weak nuclear, van der Waals, etc., as described by physical science. These types of causative scenarios are similar to those described in Talmy's force-dynamic model, absent the focus on the agonist's (causer) inherent force tendency, which is, after all, always in the direction of the sub-event for causative events. Here, as above, it is the disposition of the causee that is relevant for the selection of periphrastic causative verb. So for example, gravitational interactions are responsible for the selection patterns in (132) and magnetic interactions in (133), but in both cases, *let* is used when the caused subevent is in alignment with the causee's disposition, and *force* is used when they are opposed:

(132) a.   John forced the boulder (to go) up the hill.
      b.   #John let the boulder (go) up the hill.
      c.   # John forced the boulder (to go) down the hill.
      d.   John let the boulder (go) down the hill.

(133) a.   John forced the two negative magnetic poles (to go) together.
      b.   #John let the two negative magnetic poles (go) together.
      c.   # John forced the negative and positive magnetic poles (to go) together.
      d.   John let the negative and positive magnetic poles (go) together.

Get is used when a disposition is overcome, usually with an effectuating action followed by self-sustaining activity – as is the case for directive causation, there is a change in disposition:

(134) a.   John got the ball rolling.
      b.   #John got the rock to drop.

In (134a), the static inertia of the ball is overcome, followed by movement inertia, representing a change in disposition, while in (134b) there is no disposition transition and so *get* is infelicitous. Note that this is consistent with cases in which an initial resistance might be followed by a stable result state (like rest), so *John got the boulder up the hill* is felicitous if there is some result state, however brief, of it being on top of the hill. As stated before, *have* is infelicitous in manipulative causation events, since inanimate objects are (usually) incapable of suspending their dispositions in obedience of the will of a causer.

In the sections that follow, directive causation will continue to be the primary empirical domain of study. Furthermore, in the corpus studies below the feature of volition will initially serve as the focus of inquiry as a more identifiable property than inclination and as something that seems to track it, however roughly. This

focus will then shift to more penetrative analyses based on preliminary surveys in which inclination will itself be measured explicitly.

3.5   Summary

The discussion above might be schematized by the following complete, but ultimately potentially misleading typology, to be revised:

	Inclined	**Resistant**
Let	+	-
Get	+	+
Have	-	-
Force	-	+

Table 5: inclination and resistance for representative periphrastics

Although there are, as represented in this table, two inclinational dimensions distinguishing the periphrastic causatives, this is logically inconsistent at any single point in time, since "inclined" and "resistant", rather than being two independent parameters, are gradable antonyms on a single dimension – they cannot both hold simultaneously.   If the periphrastics are assumed to encode values for this parameter statically, this would exclude *get* from the logical typology. Its presence in the typology crucially depends on the two features holding at different times: one before the causing event and the other after it.   For that reason, the typology requires for clarity a distinction in the time that the inclinational measure holds relative to the causing event.   However, a four-way typology with two possible values before the cause and after it now excludes *have*, which is neither inclined nor resistant either before or after the cause, and creates a gap. To include *have*, there

must be an option among the periphrastics for unmarked values,[78] creating even more gaps. This allowance generates the following exhaustive but no longer exhausted while perhaps more transparent typology:

	Before Cause Event	After Cause Event
Let	inclined	inclined
Get	resistant	inclined
Have	(unmarked)	(unmarked)
Force	resistant	resistant

Table 6: revised typology of periphrastic causatives based on inclination and time.

This typology, in turn, reflects points along the single inclination continuum, reflected by the tests given here focusing on the extreme polar values:

let >> get / have >> force

INCLINED   Causee Inclination   RESISTANT
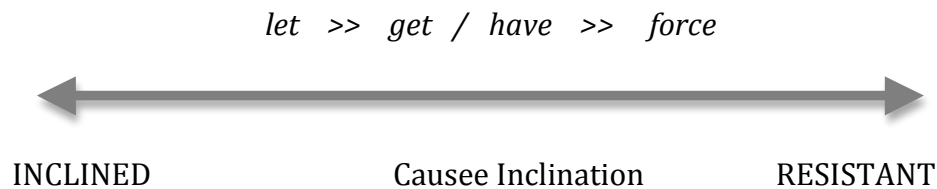
Figure 13: Patient Inclinational hierarchy for selected English periphrastic causatives.

In the following section, an attempt is made to make sense of the distribution of these causative verbs in terms of the head verbs they select for with the hypothesis that inclination will emerge. As a more salient measure on individual lexical items, volition will be the focus of the preliminary observations of the survey in the

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[78] A typology of the sort given in the chart below might also be too strong in its characterization of *get,* which is arguably not necessarily resistant before the causing event, but just not inclined, or not necessarily inclined after the causing event, just not resistant. In this characterization, *get* might be better specified as unmarked prior to the causing event or after it, so long as it represents an inclinational transition of some kind, but this possibility is not pursued here.

following section, with a returned focus on inclination proper, based on these results, in the section that follows it.

4.   Corpus Studies

4.1   Introduction and Methodology

A hypothesis following from the preceding discussion is that a periphrastic causative verb will display selectional biases on the predicate of the caused subevent, insofar as the predicate encodes inclination. A further hypothesis is that these inclinational properties can possibly be tracked by the more clearly identifiable notion of volition as encoded by the selected predicate. To collect data bearing on the selection biases of periphrastic causatives, a latent semantic analysis was performed via a search of right collocates – argument positions – of the verbs in the Corpus of Contemporary American English (COCA). The COCA is a 450 million word balanced corpus, equally divided among spoken, fiction, popular magazines, news texts, and academic publications, as well as by year for each year from 1990-2015 (http://corpus.byu.edu/ coca/).

The data presented here were obtained by searching for verb lemmas following "X me|him|it (to)", where X is one of eight causative verbs.[79] For each verb, the five most frequent verb lemmas among all verbal collocates in the corpus

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[79] Unambiguously singular pronouns were searched in order to keep the frames consistent and avoid potential confounds. *Her* was omitted due to the homophonous possessive pronoun. Note that *it* is included despite the focus in this chapter on directive causation, for which the causee is animate. This is due to a desire for general coverage and for consistency.

were collected, resulting in a list of verb lemmas (the horizontal x-axis in the graphs below). Each of the verb lemmas, then, is among the most frequent collocates of at least one of the periphrastic causative verbs, and the frequency for each member of this list of collocates were collected for each periphrastic causative verb expression, allowing for a stable comparison set of collocates for the verbs of interest. The vertical y-axes of the graphs represent the number of occurrence in the periphrastic frame ({periphrastic} NP (to) [V]) for each word V on the x-axis normalized by the total number of occurrences of that word (or in this case, lemmatized verb, [V]) in the entire corpus. For a given periphrastic causative X and verb y, the frequency F (the value of the y-axis in the graphs below) is given by:

$$(135) \qquad\qquad F_X(y) = \frac{\# \, of \, ([X]me \,|\, him \,|\, it(to)[y])}{\# \, of \, [y]}$$

This normalization will be referred to hereafter as "collocate normalization". The results of this procedure for the periphrastic causative verbs are presented in the following section.

First, though, to get an idea of how certain collocate verbs vary in terms of selection biases of the periphrastic causatives, the frequencies of the representative verbs *be*, *do*, and *ask* are shown here. These data, unlike those in the following sections, are normalized by the periphrastic verb frequency in the corpus to control for frequency biases among the relevant comparison set. In other words, the y-axis values for the graphs in this section are calculated by an equation similar to (135), but with the number of occurrences in the corpus of the relevant periphrastic

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causative verb in the causative frame in the denominator.[80] This will be referred to as "periphrastic normalization". These graphs provide a snapshot of the varying selectional preferences of the periphrastic causative verbs.

{periphrastic} NP to [be]

{periphrastic} NP to [do]

{periphrastic} NP to [ask]
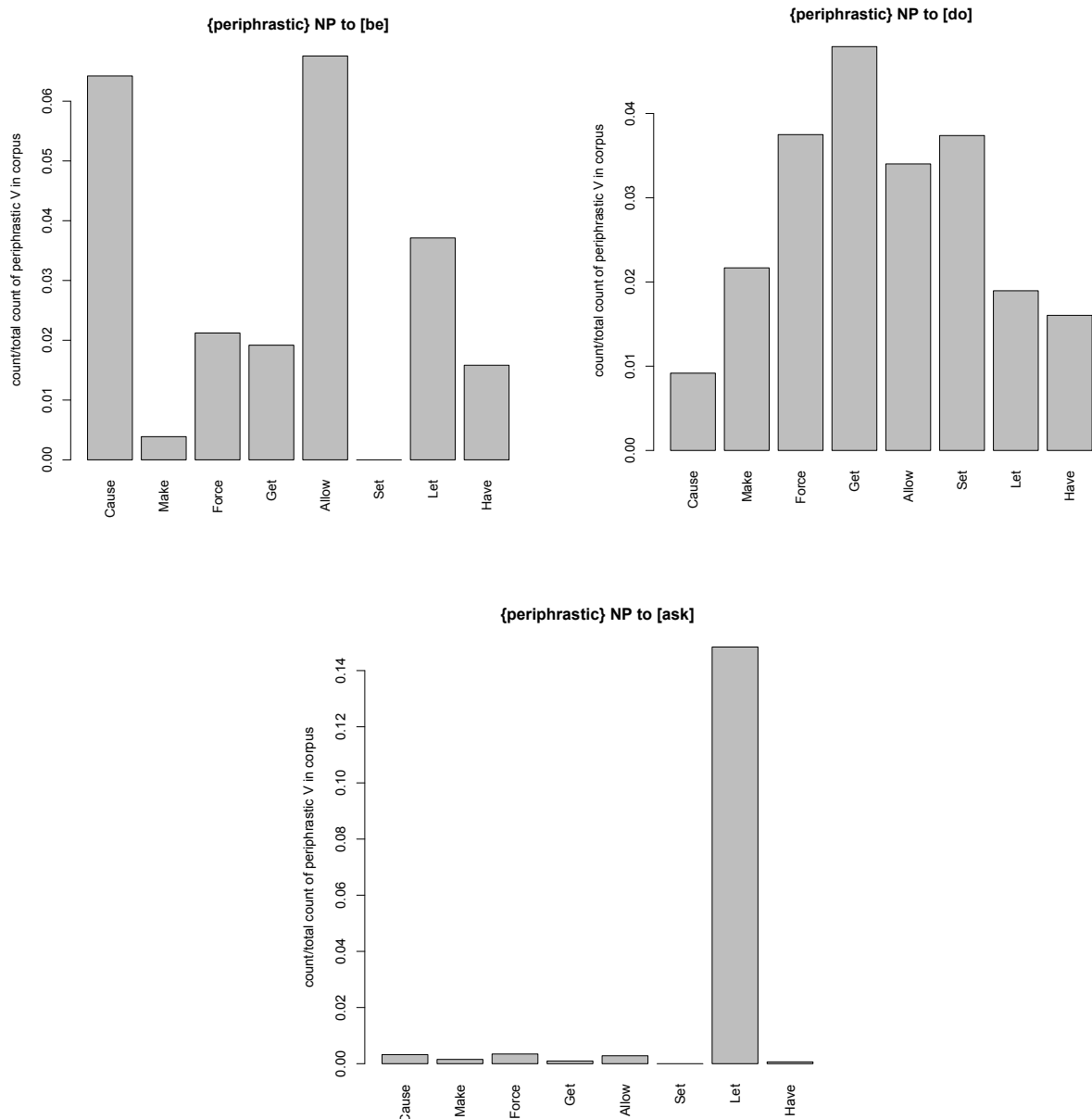
Figure 14: Graphs for frequencies of some verbs with the periphrastics.

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[80] For example, there are 119 occurrences of ([cause] me|him|it to [be]) in the corpus, and 1853 occurrences of ([cause] me|him|it to V) for any verb V in the corpus, resulting in a frequency of 119/1853 = 0.06422, the value for the leftmost bar in the first graph.

As these graphs illustrate, there is wide variation in the selectional preferences for various verbs among the periphrastic causative verbs.

As mentioned, the following data is normalized by the total number of occurrences of each collocate verb in the corpus – so variation in relative frequency rankings is a true reflection of variation in selectional preferences among the verbs and not an artifact of verb frequency. Data and graphs of non-normalized log-frequencies, as well as those normalized by frequency of the causative verb for all periphrastics can be found in the data appendix. In section 4.2, a survey of the corpus results is presented along with some preliminary observations about selectional behavior with respect to volition. In section 4.3, inclination *per se* will be targeted via a narrower analysis of these data.

4.2   Corpus Results and Volition

In the case of directive causation, volition of the causee is assumed here to be encoded by the periphrastic causative verb. In the semantics given below, this will be made explicit via the inclusion of a DO operator. However, volition plays out in different ways for the different verbs, as will be demonstrated, and not all uses or senses of the periphrastics are directive, so frequent verb collocates were collected that seem to be non-volitional. One rough test for non-volitionality is infelicity in the imperative. Below, judgments for that test are given for the collocate verb set:

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(136)   a.   Be quiet!/#Be tall!
          b.   Take a cookie!
          c.   Work harder!
          d.   ??Seem friendly!
          e.   # Know the answer!
          f.   Stay away!
          g.   Lose the jacket!/#Lose your keys!
          h.   Do it now!
          i.   Talk louder!
          j.   # Happen!
          k.   ?See the bird!
          l.   Let me go!
          m.   ? Miss school!/#Miss Mary!
          n.   Leave school!
          o.   Stop doing that!
          p.   Ask me anything!
          q.   Look at that!/??Look pretty!
          r.   Come here!
          s.   ? Fall down!
          t.   Make it happen!/Make a birdhouse!
          u.   Feel better!/#Feel happy!
          v.   Tell me a secret!
          w.   Get a book from the shelf!/Get excited!
          x.   Try harder!
          y.   Think about it!
          z.   Go away!

Based on these judgments, non-volitional or less volitional verbs include *know, happen, be, feel, lose, seem, look* (in one sense), *see, miss*, and *fall*. The volitionality of the collocate verb has measurable effects on selection patterns, as will be seen.

As described in previous sections, the effectuating causatives like *get*, *make*, and *force* differ from the enabling causatives like *let* and *allow*. The enabling causatives involve the removal of an obstacle and so the causer does not oppose the will or tendency of the causee. But *let* and *allow* also seem to have an extended meaning rooted in politeness. It appears that these verbs signal respect by

suggesting that the addressee has the social authority or status to impede the activity denoted by the complement clause. This might be the source of expressions like *let me ask* and its variants, which is typically followed immediately by the question the speaker intended to pose:

(137) a.   "All right, let me go back to the question of the budget…"

(ABC_Brinkley, 1996)

b.   "Let me bring you back in this conversation"   (NPR_Saturday, 2002)

c.   "Let me just touch on the rest of the story"   (NPR_TalkNation, 2007)

There is also a construction involving knowledge, in which the addressee is expected to have some information and the speaker asks her to abstain from withholding it by requesting of her to *let me know*:

(138)   "I tried to let him know how important he was."   (SportingNews, 2009)

These constructions are so common, in fact, that they are dominantly represented in the collocate normalized complement clause distribution:

Let NP V
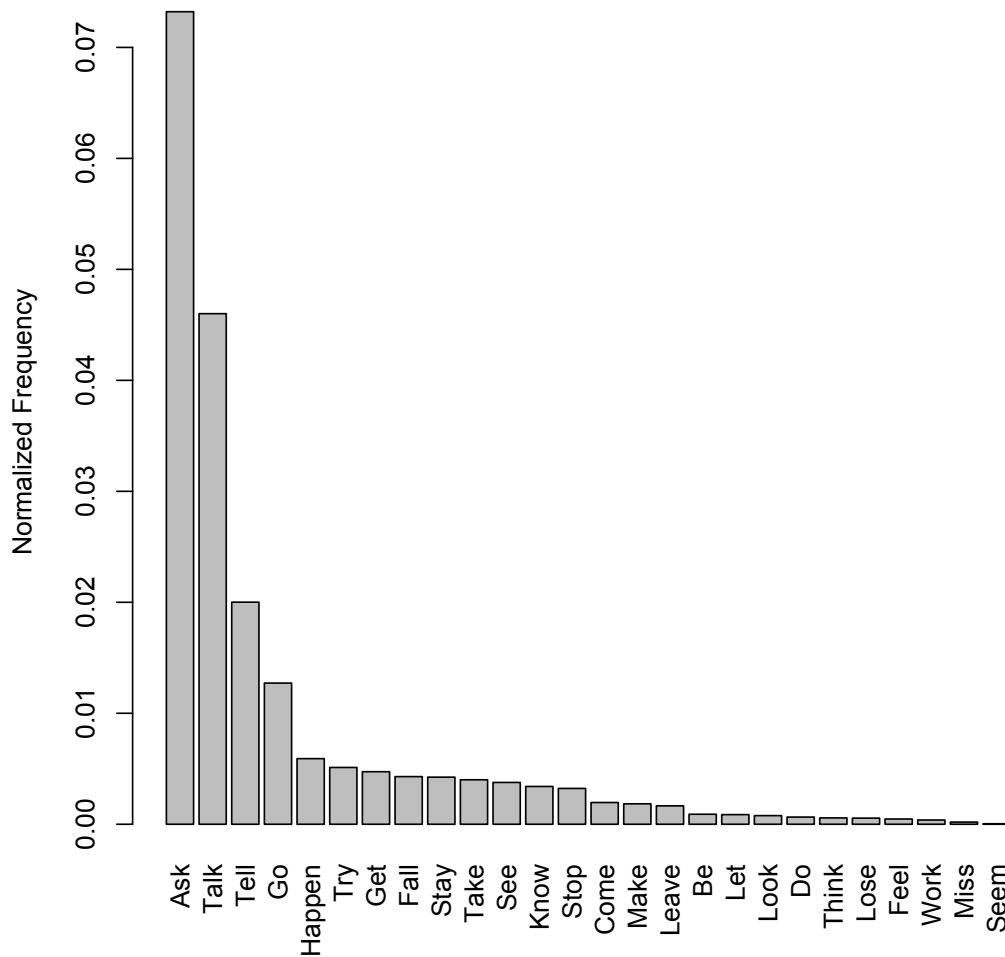
Figure 15: distribution of representative verbs occurring in the complement clause of **let.**[81]

Note that, despite the relatively high frequency of non-volitional *know* due to the "let X know" construction – *let* is still extremely rare with nonvolitionals like *feel* and *seem*. This is predicted by the inclinational status of *let* as encoding an inclined causee and the coarse-grained relation, but robust correlation, between inclination and volition.

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[81] To take this verb and its most frequent collocate as an illustration of method, there are 7000 occurrences of a lemma of *ask* in the "Let NP [ask]" frame, and 95,605 occurrences of *ask* in the corpus, giving a normalized frequency of 7000/95,605 = 0.07322, the value for the leftmost bar. See the data appendix for all raw data.

In order to filter the extended, non-causative uses of *let* from the complement distribution, the idiomatic *know* was removed. Further, since the extended politeness usages are all imperatives, an attempt was made to remove these by searching for only those '[let] NP V' utterances preceded by a noun. The results are shown in the graph below, for which verbs that are infelicitous in the imperative are preceded by a tilde (~):

N Let NP V
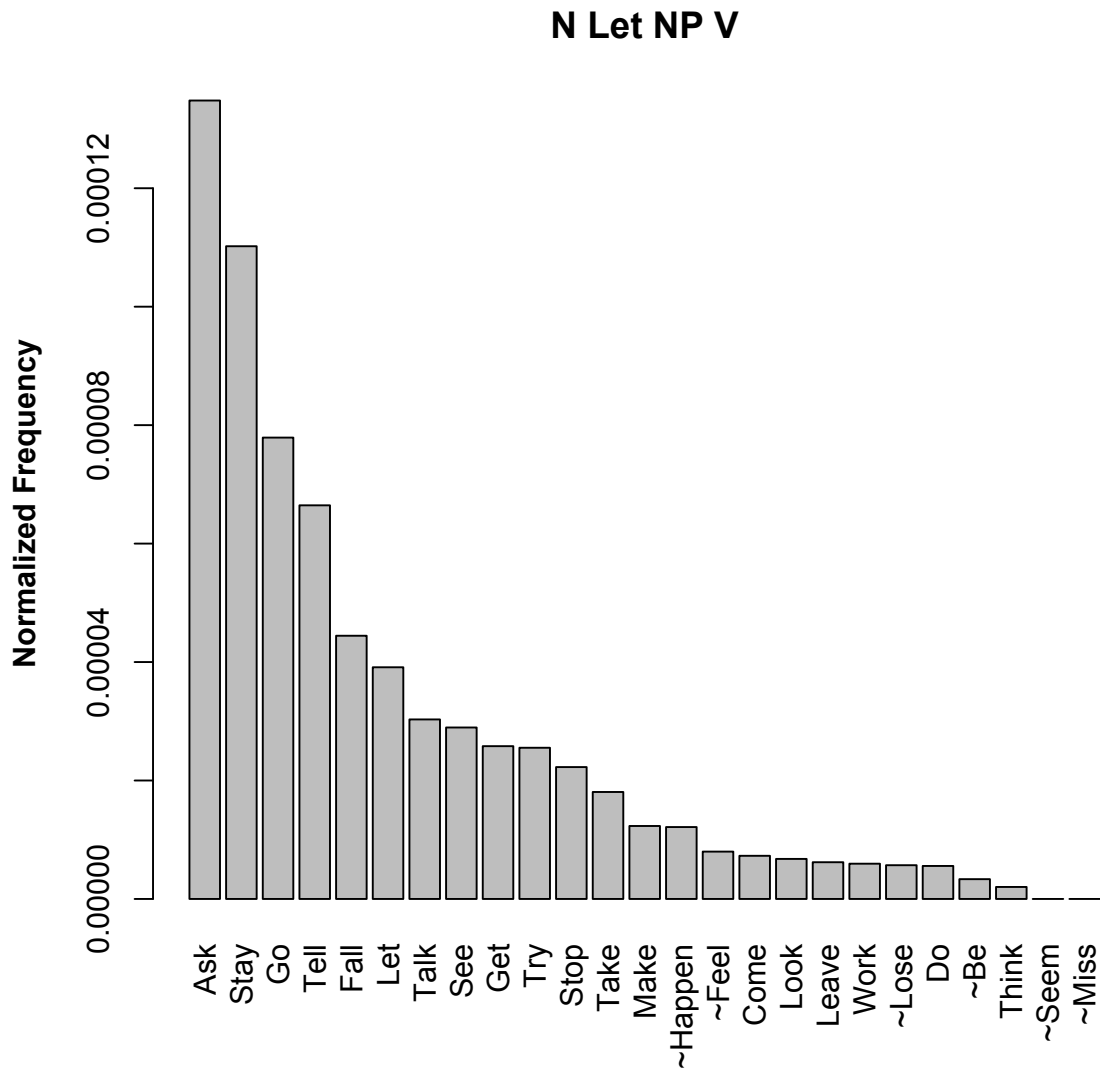
Figure 16: Filtered distribution distribution of representative verbs occurring in the complement clause of
let

Note that this filtering has lessened but not removed the interference with other uses. It has also had unintended consequences, such as depressing the frequency of verbs that commonly occur in imperatives with *let* but might still sometimes be causative, like *talk*. Furthermore, the lack of syntactic structure or semantic role annotation in the COCA means that even those frames preceded by a noun are sometimes the extended usages:

(139) a.   Howie let me ask you….   (Spoken: Fox, 2015)
       b.   Critics let me ask you, I'm not trying to plug any particular movie…
                                                                      (Spoken, 2015)

It should be noted that *ask* can occur with *let* in an imperative, but genuinely directive causative use:

(140) Please let me ask him a question!

Crucially, though, in both distributions above, the most frequent collocates with *let* are the volitional *ask* and *stay*, and the least frequent are the non-volitional or less volitional *seem* and *miss.*

Force, as argued in 2.2, denotes direct causation acting on a non-cooperative patient. Since direct, coercive causation requires volitional control from without, verbs in complement clauses representing cognitive or emotional states, like *feel* and *think*, are comparatively rare, since these things cannot be directly coerced or compelled. Similarly to (non-idiomatic) *let*, non-intentional stative verbs like *seem* and *know* are practically absent:

Force NP to V
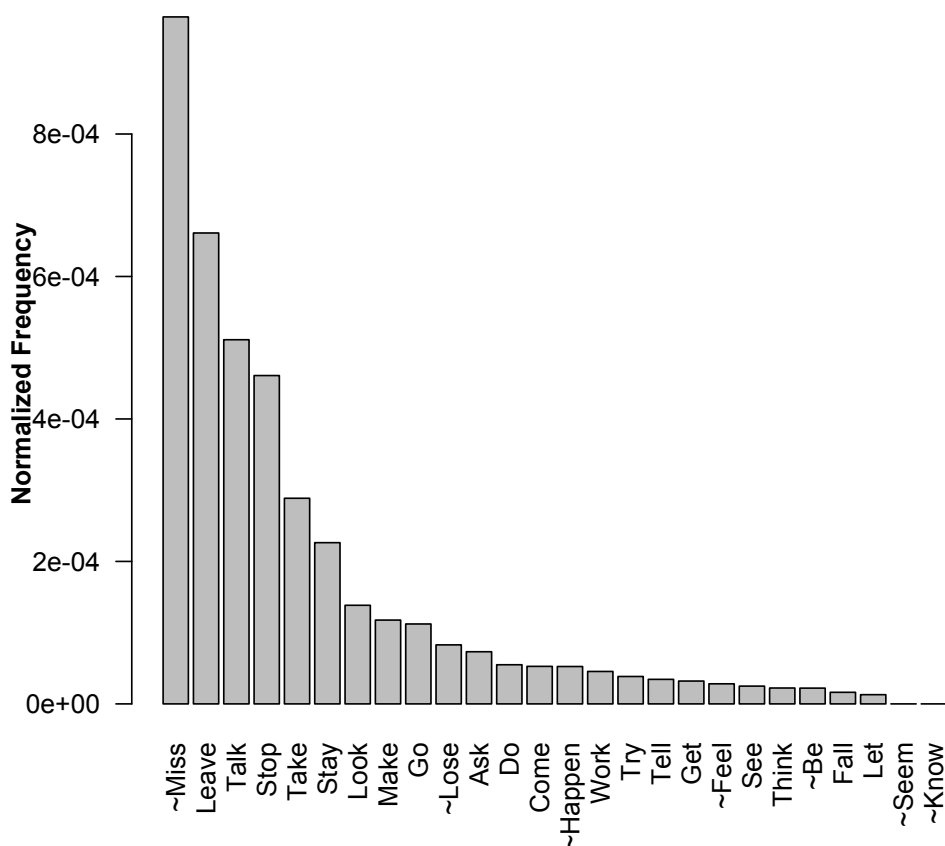
Figure 17: distribution of representative verbs occurring in the complement clause of **force.**

Even when causation is not specifically constrained to directive varieties, then, *force*

seems to select for volition.

    As discussed in section 2.2 above, causative *get* suggests patient cooperation

that is somewhat more resistant than that of patients of causative *have.*[82] *Get* with

an animate patient requires that the causer do something to influence the causee's

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[82] Rampant polysemy makes corpus data collection for causative *have* infeasible. However, I hope
that the stereotypical employee/employer relationship that is evoked by sentences like *she had him
fax the letter*, which seems to include a cooperative patient and a possible causer/causee power
differential, as well as the discussion in the preceding sections, makes the relevant semantic
character of this verb relatively noncontroversial.

will, but she has no direct authority or power. The patient has the right to refuse the

agent's desires, as suggested by the sentences in (141):

(141) a.　　　"…that's the best way to get them to come forward." (CNN – AM, 2006)

　　　　b.　　　"…a number of us have been trying for years to get the government to

　　　　　　　recognize it."　　　　　　　　　　　　　　　　(PBS Newshour, 1990)

Also suggestive is the distribution of verbs that appear in the complements of *get*:

Get NP to V
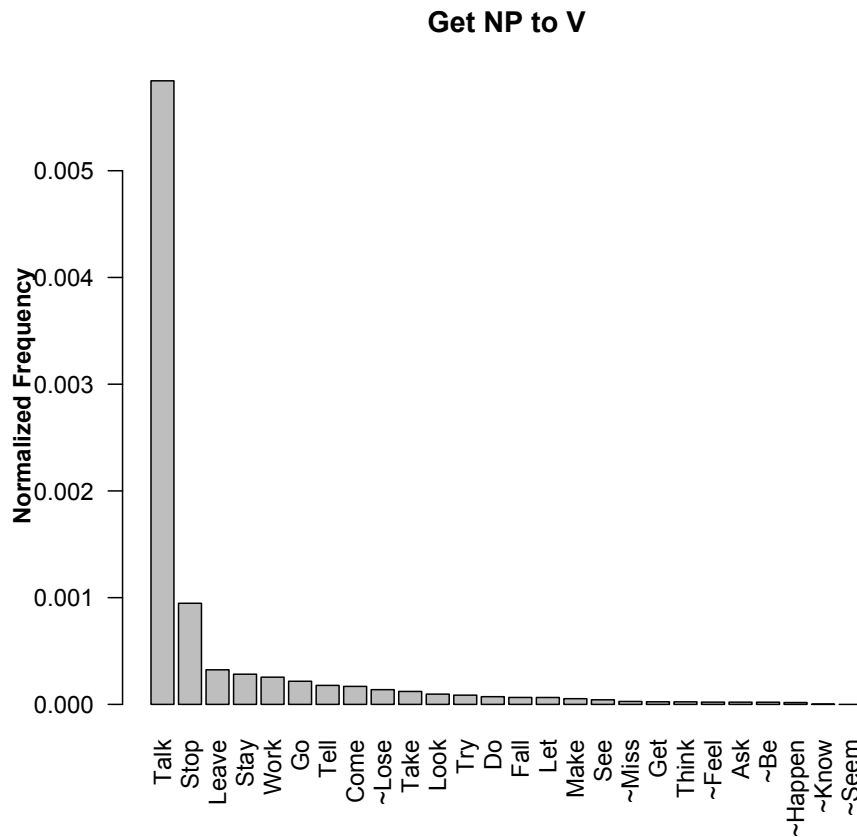
Figure 18: distribution of representative verbs occurring in the complement clause of **get**.

The most frequent verbs, such as *talk, stop, leave, stay, work, go, tell*, and *come*, are

all compatible with a volitional subject when it is animate (and some, like *talk* and

tell seem to preferentially select for a volitional subject), whereas non-volitional

verbs like *seem*, *know*, and *feel* are comparatively rare, similar to the results for *let*

and *force.* While someone can refuse to do something, she cannot similarly refuse to know something. This further supports the claim made in the previous section that *get* causation with an animate patient involves influencing the patient's will, which appears to be a fundamental feature of the meaning of causative *get*.

A summary of these data, including the most and least common collocates with *let, get,* and *force* along with judgments regarding the imperative volition test, is given in the table below:

	Most Common Collocates	Felicity in Imperative	Least Common Collocates	Felicity in Imperative
Let	Ask	✔	Miss	?✘
	Stay	✔	Seem	✘
	Go	✔	Think	✔
	Tell	✔	Be	✔✘
	Fall	?	Do	✔
Force	Miss	?✘	Know	✘
	Leave	✔	Seem	✘
	Talk	✔	Let	✔
	Stop	✔	Fall	?
	Take	✔	Be	✔✘
Get	Talk	✔	Seem	✘
	Stop	✔	Know	✘
	Leave	✔	Happen	✘
	Stay	✔	Be	✔✘
	Work	✔	Ask	✔

Table 7: Summary of most and least common collocates of representative periphrastic verbs.

The most common collocates for all three verbs are volitional or marginal, and the least common tend to be non-volitional. A possible explanation for the partially exceptional *force* is given below.

4.3   Inclination in the corpus data

Not surprisingly, given the nature of directive causation, the corpus data above suggest that periphrastics with pronominal objects preferentially select volitional predicates over nonvolitional ones in general. There is an interesting trend for the most obviously volitional verb that might support the claim in the previous section that inclined causatives are somehow "more volitional" than resistant ones, however. As mentioned in 3.4 above, highly volitional predicates seem to be better with inclined patients. This is reflected in the corpus results for the most unambiguously volitional predicate among the complement verb class: *try.*

{periphrastic} NP (to) [try]
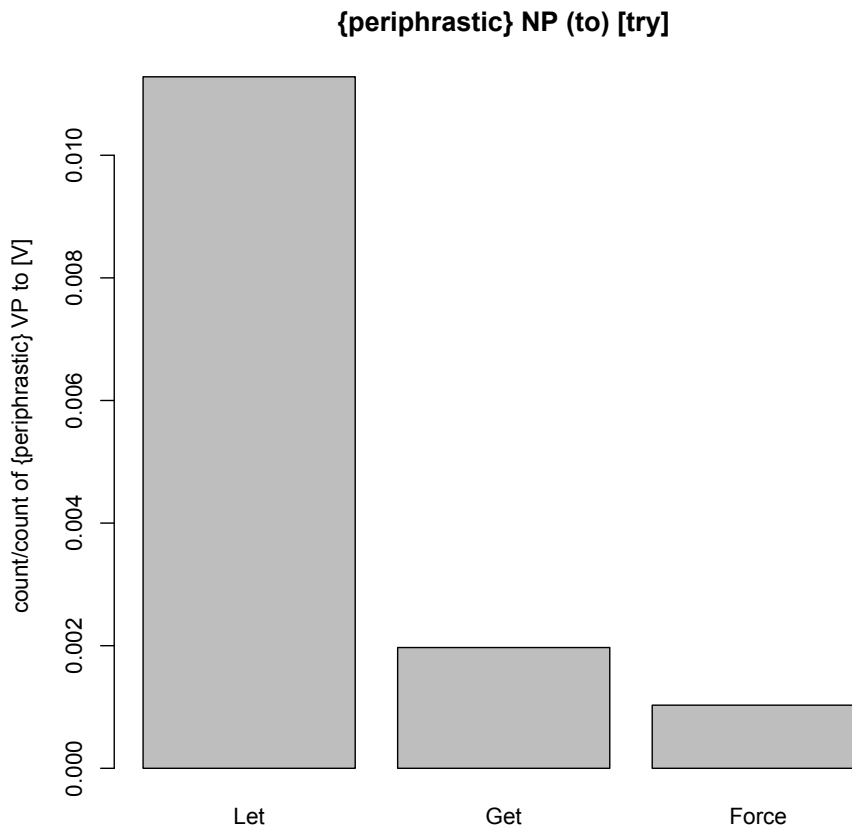
Figure 19: frequency of *try* in the complement of periphrastic verbs.

These data, unlike those presented above, are normalized by the frequency of the periphrastic verb in the causative construction frame (periphrastic normalization), so the differences between these values are not artifacts of the frequency of the periphrastic.

Although it is only a single verb and subject to any number of confounds, this distribution is consistent with the claim that volition (or something like it) roughly tracks the selectional bias differences of the periphrastic causative verbs. Making use of the imperative test for volitionality above, the effect can be seen to be more widely spread. If every verb that is felicitous in the imperative is given a value of 1 and every verb that (in at least one sense) is infelicitous is given a score of -1, while the marginal verbs *see*, *miss*, and *fall* are given a value of 0, and then these numbers are multiplied by their frequency with the three causatives examined above, normalized by the frequency of the periphrastic (since it is the difference between the periphrastics verbs that is being probed here), the effect with *try* is replicated across the complement set:[83]

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[83] These data exclude *know* from the complement set of *let*, as mentioned above. Note, however, that even when *know* is included and all data is non-curated and uniform, *let* has a volitionality score of 0.407760979, which is still by far the highest of the three verbs.

Volition Measure for Periphrastics
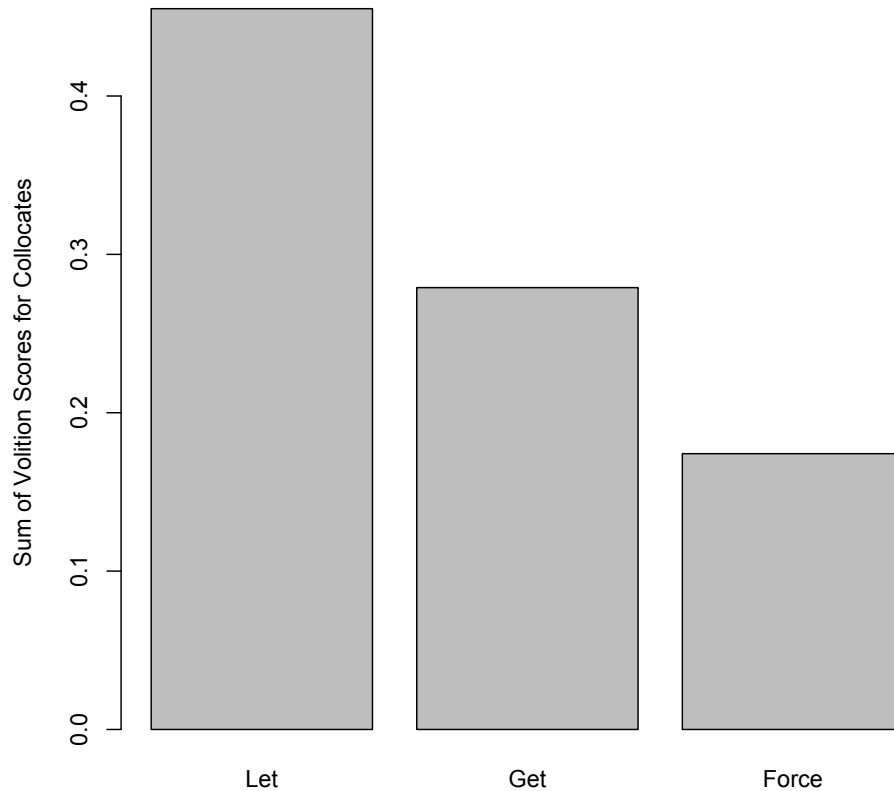
Figure 20: Volition scores for *let*, *get*, and *force* based on felicity of their collocates in imperatives.

These data show higher rates of felicity in the imperative for collocates of *let* than *get*, and higher rates for *get* than *force*, suggesting a difference in the degree of volitionality selected in the causee for these verbs. If the marginally felicitious examples in (136) are assimilated to volitionals, the odds that a complement will be volitional for each periphrastic can be calculated by comparing the counts in the corpus of volitional verb collocates to nonvolitional verbs for each periphrastic causative. Using this measure, the odds that a complement verb of *let* will be volitional is 10.83:1, while for *get* it is 9.08:1, and for *force* it is 5.49:1.

Volition, however, is clearly an imprecise measure of inclination and a not very predictive parameter in determining the selection of a particular verb. Furthermore, felicity in imperatives is only a rough test for volition, and imperatives can be bad if the verb, even if volitional, is associated with negative speaker sentiment (Childers 2013): ??*Inflict damage*!, ??*Do bad things*!, ??*Cause harm*! (see chapter 4 for a discussion of negative sentiment and *cause*). These distributions do reveal differences in inclination, however, but its detection requires more targeted analysis. In particular, the presence of inclination is demonstrated by the frequency with which the complement verbs are modified by the respectively inclined and resistant adverbs *eagerly* and *grudgingly* and then relativized to the distributions given in the preceding section.

For each of the verbs comprising the complement vector, an inclinational measure was obtained by dividing the difference between the frequency of modification by *eagerly* and *grudgingly* by their sum:

$$\frac{(\text{"eagerly v"} + \text{"v eagerly"}) - (\text{"grudgingly v"} + \text{"v grudgingly"})}{(\text{"eagerly v"} + \text{"v eagerly"}) + (\text{"grudgingly v"} + \text{"v grudgingly"})}$$

For a verb that only appeared with *eagerly* but never with *grudgingly*, an inclinational measure of 1 would be assigned, while a verb that is only ever modified by "grudgingly" and never by "eagerly" would have an inclinational measure of -1:

$$\left[\left(\frac{x-0}{x+0}\right)=\frac{x}{x}=1\right]$$

$$\left[\left(\frac{0-x}{0+x}\right)=\frac{-x}{x}=-1\right]$$

In this way, a verb with a higher number in the range [1,-1] represents a greater degree of inclination. For each verb, this inclinational measure weight is multiplied by the frequency that it appears in the complement (as a percentage of all other complement verbs of that periphrastic) of each periphrastic causative and the sum of all weighted complement frequencies provides a degree of inclination for each periphrastic causative verb:

$$C_v = \frac{x_v - y_v}{x_v + y_v}$$

$$\chi_c = \sum_v C_v p_v$$

Based on the analysis in terms of inclination given in the sections above, it is predicted that *let* would score highest on this measure, *force* lowest, and *get* – as both inclined and resistant at one time or another – somewhere between the scores for *let* and *get*. Indeed, $\chi_{let} = 0.256$, $\chi_{get} = 0.117$, and $\chi_{force} = 0.068$.

Inclination Measure for Periphrastics
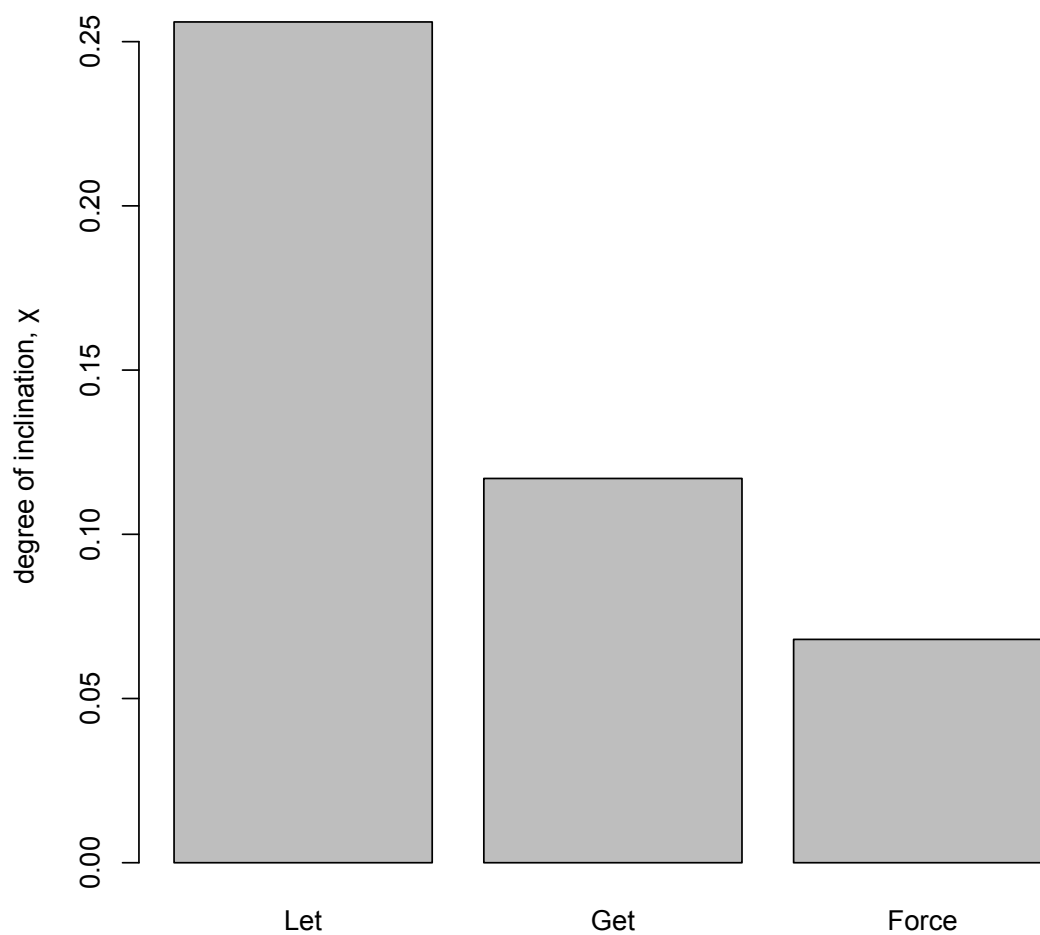
Figure 21: Inclination scores for collocate verbs of *let*, *get*, and *force*.

Although inclination is not categorical due to the influences related to competing wills in context, as discussed above, as well as the likelihood that many of the collocate verbs are general with respect to inclination out of context, the trend demonstrates that the differences in these verbs in terms of inclination manifests as a measurable selection bias.

5.   An Event Semantics for Directive Causation

A formalization of the meaning of the four verb discussed above makes use of events, quasi-aspectual operators CAUSE and DO as employed in Dowty (1979), and preference operators based on a preference relation over the occurrence of events. In particular, let R be the predicate introduced by the embedded verb with meaning R',[84] and ∂ be a presupposition operator (Beaver 2008). Let P_X be individual X's preference relation partially ordering the domain of occurrences (represented by an occurrence operator O where O(e) is the proposition that event e occurs (Lewis 1973, Dowty 1979) and $\sim$O(e) is the proposition that event e does not occur, or the complement of the set of worlds in which it does) such that O(e) P_{John} $\sim$O(e) indicates that John prefers the occurrence of e to the non-occurrence of e, abbreviated as PREFER(John, e) with the opposite ordering $\sim$O(e) P_{John} O(e) abbreviated as DISPREFER(John, e). Finally, assume a standard temporal ordering signaled by number such that for times t0, t1, and t2, and a precedence ordering <, t0 < t1 < t2. CAUSE(x, e_2)(e_1) means that e_1 is the event of x causing event e_2. Example sentences containing the periphrastics are then translated as follows:

(142) "John let Bill dance"

$$\exists e_1 \exists e_2.[CAUSE_{t1}(John, e_2)(e_1) \wedge dance'_{t2}(Bill)(e_2) \wedge DO_{t2}(Bill, e_2)$$
$$\wedge \partial(\exists e_3.[dance'_{t2}(Bill)(e_3) \wedge PREFER_{t2}(Bill, e_3)])]$$

---

[84] Note that the operator DO is used here, rather than just specifying that volitionality is a part of a subject meaning relation R'(x, e) in order to explicitly encode volition in the meaning of the directive causative verbs and distinguish words like *have* from words like *make*. See below for a discussion of the consequences of this distinction.

(143) "John forced Bill to dance"

$$\exists e_1 \exists e_2.[CAUSE_{t1}(John, e_2)(e_1) \wedge dance'_{t2}(Bill)(e_2) \wedge DO_{t2}(Bill, e_2)$$
$$\wedge\ \partial(\exists e_3.[dance'_{t2}(Bill)(e_3) \wedge DISPREFER_{t2}(Bill, e_3)])]$$

(144) "John had Bill dance"

$$\exists e_1 \exists e_2.[CAUSE_{t1}(John, e_2)(e_1) \wedge dance'_{t2}(Bill)(e_2) \wedge DO_{t2}(Bill, e_2)]$$

(145) "John got Bill to dance"

$$\exists e_1 \exists e_2.[CAUSE_{t1}(John, e_2)(e_1) \wedge dance'_{t2}(Bill)(e_2) \wedge DO_{t2}(Bill, e_2)$$
$$\wedge\ PREFER_{t2} (Bill, e_2) \wedge \partial(\exists e_3.[dance'_{t2}(Bill)(e_3) \wedge DISPREFER_{t0}(Bill, e_3)])]$$

Here, as discussed, only *get* includes a grammatically relevant temporal component as a part of its meaning, beyond those included in the formulation of CAUSE and DO.

The lexical meanings can be abstracted from the sentence meanings as follows:

(146)   Let:

$$\lambda x \lambda R \lambda y \lambda e_1 \lambda e_2.[CAUSE_{t1}(y, e_2)(e_1) \wedge R'_{t2}(x)(e_2) \wedge DO_{t2}(x, e_2)$$
$$\wedge\ \partial(\exists e_3.[R'_{t2}(x)(e_3) \wedge PREFER_{t2}(x, e_3)])]$$

(147)   Force:

$$\lambda x \lambda R \lambda y \lambda e_1 \lambda e_2.[CAUSE_{t1}(y, e_2)(e_1) \wedge R'_{t2}(x)(e_2) \wedge DO_{t2}(x, e_2)$$
$$\wedge\ \partial(\exists e_3.[R'_{t2}(x)(e_3) \wedge DISPREFER_{t2}(x, e_3)])]$$

(148)   Have:

$$\lambda x \lambda R \lambda y \lambda e_1 \lambda e_2.[CAUSE_{t1}(y, e_2)(e_1) \wedge R'_{t2}(x)(e_2) \wedge DO_{t2}(x, e_2)]$$

(149)   Get:

$$\lambda x \lambda R \lambda y \lambda e_1 \lambda e_2.[CAUSE_{t1}(y, e_2)(e_1) \wedge R'_{t2}(x)(e_2) \wedge DO_{t2}(x, e_2)]$$
$$\wedge\ PREFER_{t2} (x, e_2) \wedge \partial(\exists e_3.[R'_{t2}(x)(e_3) \wedge DISPREFER_{t0}(x, e_3)])]$$

Note that DO(x, e) means that e is under the unmediated control of the agent x (see Dowty 1979, 118); here it specifies volitionality, which makes its inclusion in the semantics a way of capturing directive (as opposed to manipulative) causation. Given that, *let*, *force*, and *have* differ only with respect to their presuppositions. The difference between *let* and *force* is that the former presupposes that the causee prefers performing the event to not performing it (146), while for *force* the preference relation is reversed (147).

The dynamic character of *get* is captured by the assertion that the patient's preference relation at the time of the caused sub-event (t2) has a *let*-like ordering and the presupposition that the patient's preference relation at some time (immediately) prior to the causing event (t0) has a *force*-like ordering (149). The motivation for putting only the prior preference under the presupposition operator is that it, but not the later re-ordered preference, survives negation and other presupposition-transparent constructions:

(150)   I didn't/couldn't get him to do it. He was #(un)willing.[85]

The causee's previous (and presumably surviving, in the case of negation) resistance is not cancelled by negation, so presupposed, but the inclined status does not project and is likely therefore asserted by *get*.

The verb *have* has no presuppositions with respect to patient inclination, and is as such the unmarked directive causative, as suggested in (148). One immediate question that this formulation invites is how *have*, which, as shown, seems to be

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[85] Metalinguistic negation, with focus-marked *get*, is felicitous: *I didn't GET him to do it. He was willing.* This seems to be a denial of the appropriateness of the utterance, rather than its truth.

quite restricted in its use, could be the unmarked member of the set. It is plausible that, due to the general pragmatic principle that speakers should seek to maximize presuppositions (Heim 1991), it will often be less felicitous than other periphrastics when their presuppositions are satisfied. For illustration, the claim that speakers should maximize presuppositions is clearly demonstrated in cases when something is explicitly in the common ground:

(151)   Max has a dog$_i$. It$_i$/the dog$_i$/his dog$_i$/#a dog$_i$ is always barking.

In this example, it is asserted that there exists a dog and that Max owns it. The discourse is felicitously extended in cases where the existence of the dog is presupposed, as is the case for the pronoun, definite phrase, and possessive phrase, but infelicitous when the dog, which has already been introduced and whose existence is now taken for granted by the interlocutors, is introduced again, as is the case for the indefinite, which doesn't presuppose existence. Similarly for cases involving *have*.

Suppose, for example, that both I and my friend know that his children love to play in the backyard and prefer it to the front yard; but, since they usually tear up the garden, my friend almost always tells them to play in the front. *Let*, but not *have*, is an appropriate description of my friend telling me about a change in this pattern:

(152) a.   I let the kids play in the backyard instead of the front yesterday.
      b.   #I had the kids play in the backyard instead of the front yesterday.

Now suppose I have been petitioning my boss for a raise for months, but he has been unwilling due to budget constraints. I talk about this with my spouse and we commiserate. Then one day I go into his office and give an incredible pitch about my value to the company that leaves him completely dazzled. He is so grateful for my

work and skill, and so eager that I remain at the company, that he enthusiastically offers me a raise. I go home and say to my spouse:

(153) a.   I got my boss to give me a raise.
     b.   #I had my boss give me a raise.

There is an obvious inclinational transition in this scenario, so *get*, which presupposes that transition is appropriate, and *have* is not. Finally, if I have a restaurant that is closing for the night and there are patrons who are still having an animated conversation, laughing and enjoying themselves, and I tell them they have to leave, and they plead to be allowed to stay awhile longer, not to have to go out in the rain and disperse, but I insist it is time to go, even while they continue to beg, the following judgments about a description of that event to someone who knows the facts seem to me to be robust:

(154) a.   I forced the customers to leave.
     b.   #I had the customers leave.

It is clear that the patrons prefer not leaving to leaving, *force* satisfies that presupposition, so *have*, which does not, is infelicitous. In fact, if anything is known about inclinations – and usually something is known since people are very attentive to other people's desires and apparent preferences, especially in directive causing scenarios – then another periphrastic will presuppose more information consistent with the scenario and therefore be pragmatically more appropriate. Therefore, the only time *have* will be felicitous is when the inclination of the patient is unknown or somehow irrelevant. In a causative scenario, this will correspond to exactly those cases in which the patient is seen to be will-less: his preferences aren't relevant since he is a performer of the causer's will. In particular, if the patient's inclinations

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are unknown, but directive causation is still possible, there is typically an authority differential between the causer and causee, which corresponds to the stereotypical use of *have*. But note also that non-authority scenarios that are unmarked for inclinations are also felicitous with *have*, such as telling someone that is looking for or trying to reach an acquaintance *I'll have him call you*, or describing a trivial request of a friend, as in *I had her loan me her pen for a few minutes*. The pragmatic account of the unmarked variant predicts these uses.

6.   Set, Drive, and Make

It is useful to briefly extend the discussion of periphrastic causative verbs and their behavior with respect to inclination to other, apparently more idiosyncratic, or alternatively more general predicates. In particular, one goal of this section is to survey two other, complex periphrastics, *set* and *drive*, to get some preliminary idea of how inclination interacts with other parameters of meaning, like aspect and sentiment. Another goal is to identify the general effectuating causative verb *make*, and to provide some evidence for its status as such, in anticipation of the following chapter.

Set exemplifies an interesting, temporally complex type of causation encoded by an English periphrastic causative that has not yet been discussed to this point. This type combines both an initial effectuation followed by a kind of self-agency on the part of the patient. It is expressed by the verb as it occurs in the following kinds of sentences:

(155) a.   Bob set the bird free.

       b.   Bob set the log on fire.

       c.   Bob set the alarm clock to go off at 6:00 am.

Set, like *make* and *force*, requires some kind of direct action or effectuating force on the patient, but like *let* and *allow*, there is a subsequent kind of self-agency. Although he does not identify *set* as encoding that causation type, Talmy does characterize the notion of onset causation, as illustrated in (156):

(156) a.   I slid the box across the ice by pushing on it (steadily).

       b.   I slid the box across the ice by giving it a push.   (Talmy 2000, 498)

The difference in interpretation between (156a) and (156b) is in the relative mapping of causing event and resulting event. In (156a), the box moving across the ice is "the ongoing result of an extended force impingement without which it would stop," (Talmy 2000, 498), while in (156b), the motion following the initial push is conceived as autonomous and requiring no further force. Interestingly, events of this type are often described as "setting (something) in motion," which reflects the unique causative profile of *set*. The combination of effectuating onset causation and subsequent self-agency can be seen in the sentences below:

(157) a.   "She set him to grazing on clover"   (Bk:ColdMountain, 1997)

       b.   "...pathways that are set into motion by the consumption of abused drugs..."   (DrugIssues, 2009)

       c.   "...other houses and barns were set on fire"   (SocialHistory, 1993)

In (157a), after an initial (here, perhaps enabling) causative event, the will of the patient sustains the event denoted by the complement clause. In (157b), certain neural pathways, once activated, remain active without further external influence,

and in (157c), the *set on fire* phrase describes a situation of an initiating act that is followed by self-sustaining activity – the burning of the fire. The sentence (155c), in which someone sets a device to do something at a later time, demonstrates how this initiation plus self-agentive causative scenario can be conceptualized for complex artifacts. The crucial point is that *set* introduces an aspectually complex causative event, in which a (conceptually) punctual causing event is followed by a continuous result activity or potential. The causing event produces an activity and is, in that sense, inchoative.

In the corpus sentences, almost all verbs appearing in the complements of the *set* causatives are activity verbs: *work*, *go*, etc. This tendency is consistent with the characterization that *set* is a direct but also enabling causative of a self-directed activity, and their relatively restricted set of collocate verbs is intriguing, if not yet entirely predictable, in its own right:

Set NP to V
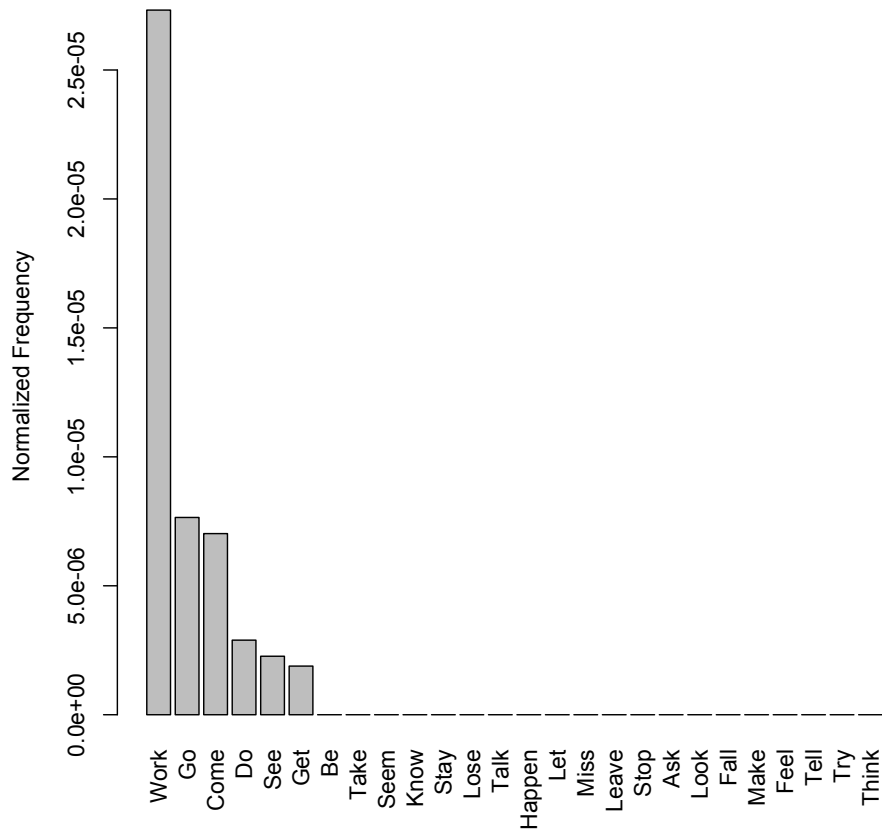
Figure 22: distribution of representative verbs occurring in the complement clause of **set***.*

This distribution, of course, reveals little beyond a very restrictive collocation bias and, perhaps, a preference for activity verbs. However, based on the discussion above and the corpus sentences themselves, *set* appears to be general with respect to the inclination status prior to the causing event, but specifies that the causee is inclined after it. In other words, it is either like *let*, in which the causee is inclined, or like *get*, in which the causee's inclinational status becomes inclined.[86] In addition to this inclinational

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[86] In fact, *set* is sometimes used similarly to the "un-inclined" causative *have*, for which the patient is an instrument of the agent's will, as in *John set the employees to cleaning the office*. There might, however, be dialectical variation regarding the acceptability of such uses.

encoding, this verb encodes onset causation and entails an ongoing resultant activity after a punctual causing event.

Drive, on the other hand, denotes an extended effectuating causation that is coextensive with the path leading to the result state. For most sentences containing the periphrastic causative *drive*, the interpretation is the extended application of a (usually unpleasant) force resulting in an adverse reaction or state:

(158) a. "The smoke drove the squirrel from its tree." (Talmy 2000, 540)

b. "...that despair drove him to violence." (New York Times, 2002)

c. "...your incessant barking is driving me crazy." (NPR_TalkNation, 2009)

d. "Lucifer was driven away from heavenly paradise."[87]

(Scandanavian Studies, 1998)

In (158a), it is presumably the continuous presence of smoke that is co-extensive with the squirrel going up the tree, and in (158b,c) it is a constant application of despair and barking, respectively, that is continuously and cumulatively leading to the adverse result. And in (158d), although the judgment is more subtle, the image of "driving away" is one of a push co-extensive with movement away, whether or not the process be a literally physical one.

Like *set*, *drive* is relatively restricted in its collocation patterns, but in addition to physical activity verbs, it also co-occurs with the volitional and cognitive verbs *try* and *think*, and so does not necessarily specify some ongoing activity following the (in this case continuous) causing event:

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[87] Here, the example collocates are of different grammatical categories than the data that was directly gathered in the study and presented in the graphs. They are presented here for illustrative purposes.

Drive NP to V
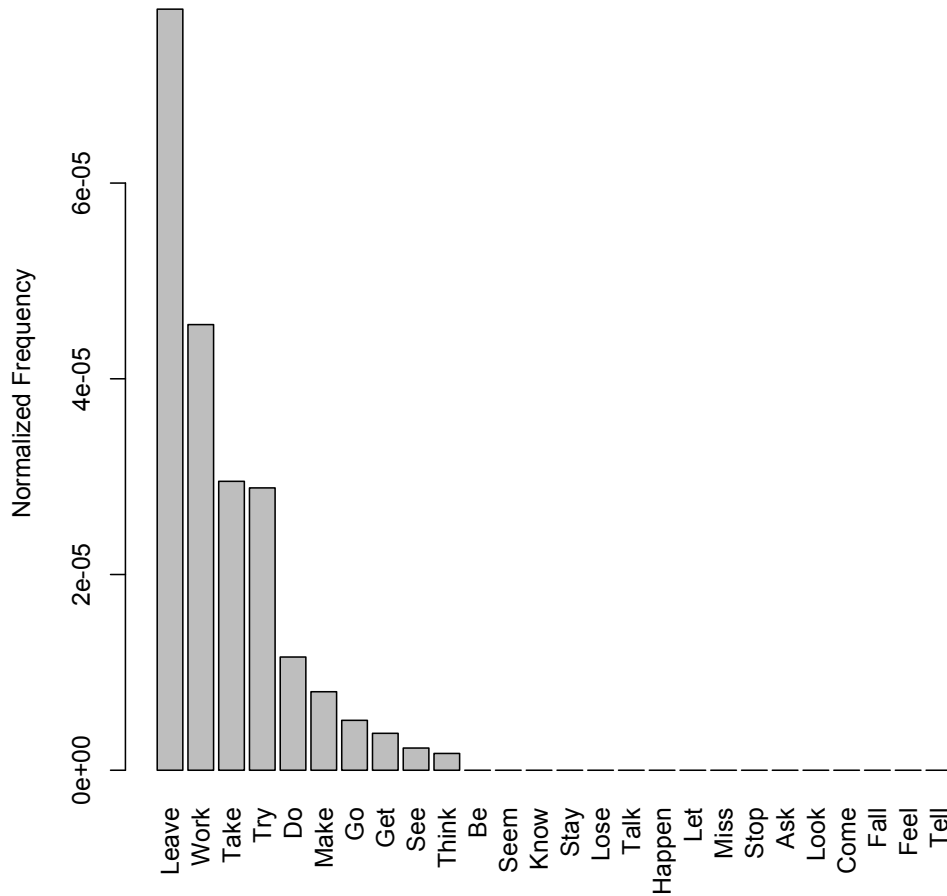
Figure 23: distribution of representative verbs occurring in the complement clause of **drive.**

Drive, like *force*, behaves like a resistant causative but with an additional strong animacy requirement and a consequent negative sentiment bias. This is in addition to its aspectual character as a continuous process co-extensive with the effectuation of the result state.

The periphrastic causative *make*, in contrast to *set*, commonly occurs with verbs of emotion and cognition:

Make NP V
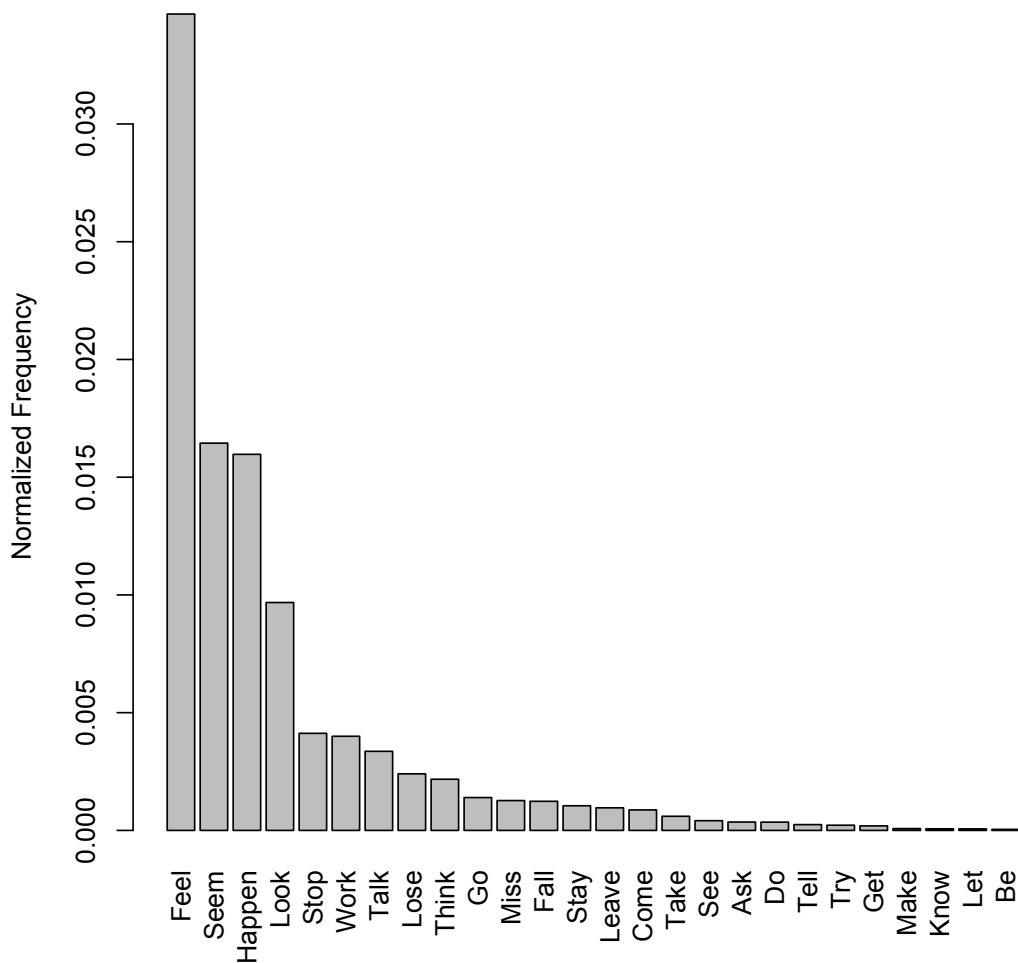
Figure 24: distribution of representative verbs occurring in the complement clause of **make**.

The most common verb in a complement clause of *make* is *feel*. Feeling, like thinking and seeming, is not necessarily volitional on the part of the patient, insofar as it is a cognitive state that is potentially unwilled. The semantics for *make* seem to lack a requirement of volitionality. While the collocation frequencies are consistent with the claim that *make* is sensitive to the degree of volitional control that the patient can exercise over the event described, as detailed in section 2.2 above, *make*

is a general effectuating causative and, as such, is compatible with causative scenarios for which inclination is unspecified or irrelevant. That *make* is, in fact, general, can be seen by comparing the distribution above, which is normalized by collocate verb frequency (collocate normalized), to a distribution that is not so normalized, but for which the verb selection frequency represents only the frequency of verb lemmas as a percentage of all verb lemmas in the periphrastic construction for *make* (periphrastic normalized).
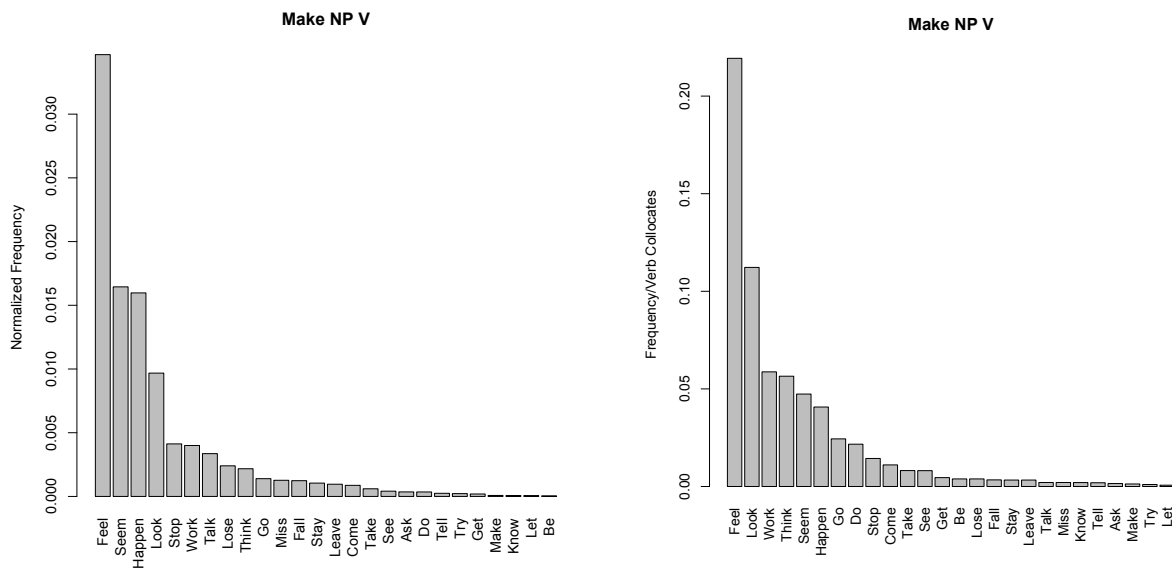
Figure 25: distribution of verbs appearing with *make* normalized by verb frequency (left) and not so normalized (right).

Despite some local reordering (*look* and *seem*, *work* and *happen*), the most frequent collocate verbs are still the most frequent verbs when normalized for their occurrence in the corpus, and likewise for the least frequent. This suggests that there are few relative ranking patterns for *make* that cannot be explained by the frequency of verbs in the corpus. The similar distribution of these graphs suggests

that *make* shows very few selection biases, except possibly an unusual felicity with relatively bleached or semantically neutral predicates like *seem* and *happen*. Otherwise, the selectional behavior of *make* seems to come close to tracking the verbal lexicon in terms of relative frequencies, or at least the relative frequencies of the sublexicon of verbs occurring in the complement of a periphrastic causative verb. Compare this to the periphrastic normalized and collocate normalized graphs for a causative with strong selectional biases, like *force*:
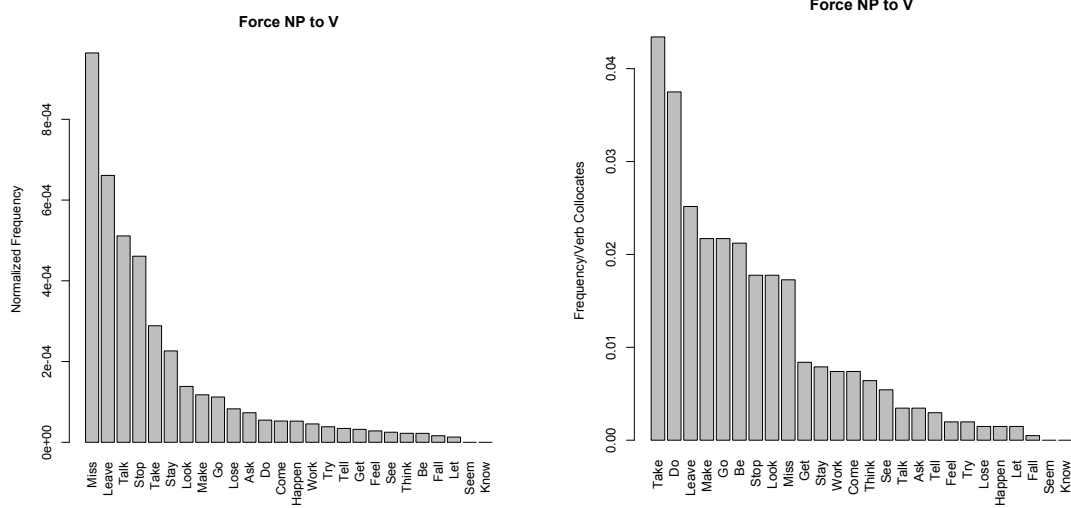
Figure 26: distribution of verbs appearing with *force* normalized by verb frequency (left) and not so normalized (right).

The periphrastic normalized variant for *force* shows radically different relative frequencies than the collocate normalized variant (compare *miss, do, go, be,* and *make* across the two) – this suggests that *force* has a strong selectional bias: the distribution of its collocates is not just a reflection of the underlying relative frequency of the verbs in the corpus. For *make* on the other hand, its selectional behavior is mostly explainable in terms of the relative frequencies of the collocate

verbs. Indeed, the fact that the collocate normalized variant is so similarly distributed to the periphrastic normalized variant and the periphrastic normalized variant is not just a flattened version of the normalized one suggests that *make* preferentially selects frequent verbs. Exceptions to this include an apparent preference for the non-volitional verbs *seem* and *happen* and a dispreference for the semantically basic volitional verb *do* (for an explanation for this in terms of the semantics of *make* as compared to the other verbs examined here, see below). Beyond this, *make* does not seem to be exercising strong selectional biases. In particular, it seems that *make* is felicitously substitutable for any of the effectuating verbs *have*, *get*, and *force*:

(159) a.   The executive had the secretary mail the letter
                    →   The executive made the secretary mail the letter

b.   Got you to look!   →   Made you look!

c.   I forced John to leave the party   →   I made John leave the party

In other words, it is claimed that all "having", "getting", and "forcing" events are "making" events. One question that this immediately invites is why *have*, but not *make* is blocked by Maximize Presupposition (John Beavers, p.c.). One possibility for this is that *make* is not identical to the directive periphrastic verb in terms of non-presupposed content. As described above, the directive periphrastic causatives have, as a part of their non-presupposed meaning a specification that the causee is a volitional agent of the caused subevent, via the DO operator. In this way, they differ only with respect to their presuppositions, making *have*, which lacks

presuppositions, infelicitous when the presuppositions of some minimally different verb is satisfied, as a consequence of the Maximize Presupposition principle. If *make* does not encode a volitional causee as a part of its semantics, and therefore lacks a DO operator, it is not identical in non-presupposed meaning to the other verbs in directive causative scenarios, and Maximize Presupposition does not apply. While *get*, *force*, and *let* can have non-volitional (even inanimate) causees, for manipulative causation as discussed above, these would have to be represented as different senses assuming the semantics given here. The fact that Maximize Presupposition does not block the felicitous use of *make* in directive causative events is further evidence that *make* is not polysemous, but is in fact a general verb. The status of *make* as a general effectuating causative will be assumed in the experiments described in the following chapter.

7.   Summary: Patient Inclination

The most common collocate verbs of the periphrastic causative verbs *let*, *force,* and *get* are volitional verbs, as suggested by their felicity in the imperative, while their least common collocates tend to be non-volitional to some extent, blocking imperatives:

	Most Common Collocates	Felicity in Imperative	Least Common Collocates	Felicity in Imperative
	Ask	✔	Miss	?✖
	Stay	✔	Seem	✖
Let	Go	✔	Think	✔
	Tell	✔	Be	✔✖
	Fall	?	Do	✔
	Miss	?✖	Know	✖
	Leave	✔	Seem	✖
Force	Talk	✔	Let	✔
	Stop	✔	Fall	?
	Take	✔	Be	✔✖
	Talk	✔	Seem	✖
	Stop	✔	Know	✖
Get	Leave	✔	Happen	✖
	Stay	✔	Be	✔✖
	Work	✔	Ask	✔

Table 8: Summary of most and least common collocates of representative periphrastic verbs.

Based on this measure and the complement distributions however, the verbs differ in their degree of volitionality, which is suggested here to be a proxy for their actual meaning difference.

The primary directive causative predicates examined here can be distinguished along a single scale: that of patient inclination. Patient inclination is a particular variety of disposition specifying how the patient's preferences are aligned with respect to performing or otherwise participating in the caused event, as defined in (108), (112), and (115). While inclination might at first blush seem to be epiphenomenal to some notion of force or causer intent, the difference between *have* and *get* is illustrative of the distinction. While both *have* and *get* represent an indirect causative scenario involving relatively compliant patients, for *have* the

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patient is a "cooperative performer of the causer's will," while for *get*, the patient is only cooperative insofar as his/her/its "will" is influenced. It is the inclination of the patient, here, that is relevant for the selection of the causative verbs. Given this criterion, an intuitive partial typology including the primary periphrastic causatives examined in this chapter is repeated below:

	Before Cause Event	**After Cause Event**
Let	inclined	inclined
Get	resistant	inclined
Have	(unmarked)	(unmarked)
Force	resistant	resistant

Table 9: partial typology of periphrastic causatives.

A proposal for the causee inclinational hierarchy, which is projected from the features of inclination and resistance and including the verbs (except *make*) discussed in the previous section, is given in figure 27 below:

<div align="center">

let   >>   set / get / have   >>   force/drive

⟵———————————————————⟶

INCLINED   Causee Inclination   RESISTANT
</div>
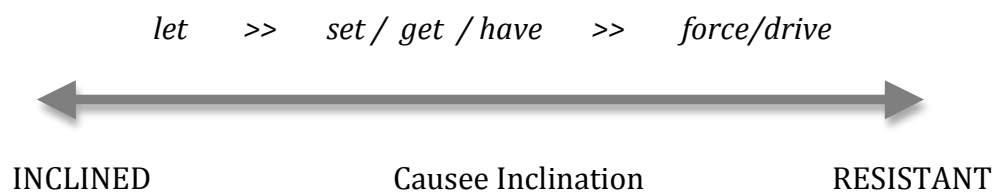
Figure 27: Patient Inclinational hierarchy for selected English periphrastic causatives.

Contra Wierzbicka, then, types of causation as modeled by interactions of opposing or aligned inclinations are independent of, and identifiable in, English periphrastic causatives. Contra Talmy, oppositions and alignments (in terms of interacting forces, for him) are incomplete characterizations of the meanings expressed by

these verbs, as seen by the behavior of *get* and *have*. As argued here, Talmy's forces are only a subtype of the dispositions that are relevant to the expression of causation, and the disposition of the causer is irrelevant to the selection of periphrastic causative verb. Furthermore, there also seem to be other selectional criteria not yet discussed that are wholly outside of Talmy's force-dynamic framework. The following chapter will be, in part, an elaboration of the latter point. That chapter extends the search for distinctions among these verbs to the question of how both sociolinguistic factors and the speaker's attitude with respect to a subevent or state influences the choice of a periphrastic causative.

Chapter 4:   Sentiment and Register Selection Biases

In Shibatani's 1976 conspectus introducing the classic <u>The Grammar of Causative Constructions</u>, the verb *cause* is characterized as the most general periphrastic causative verb (Shibatani 1976, 32), and is contrasted with other more semantically restricted causatives like *make* and *get*. This has been the traditionally dominant view of the meaning of *cause*, that it is the "unmarked" member of the set of English periphrastic causatives (for a more recent articulation, see Lauer 2010). Indeed, at first blush, *cause* is so semantically basic as to be practically a function word rather than a content word. It is, for example, a common gloss of productive causative morphemes in languages that have them – especially when the causation is being emphasized as general (i.e. as not specifically direct or indirect, sociative or manipulative, e.g. Shibatani and Pardeshi 2002, 99ff). A closer look at social and expressive dimensions of meaning, however, reveals that an abstracted notion of causation is not the whole story as concerns the meaning of *cause*.

In the sections below, I propose that sentiment and register are distinguishing parameters of meaning for the selection of causative verbs. The focus of the chapter is on the verb *cause*, with some discussion of *drive*, *let*, and *allow*, as well as a brief examination of periphrastic inchoative verbs as motivation for the distinctions proposed between the causatives. I propose that *cause* has two senses,

one associated with formal register and the other unmarked for register. The register unmarked sense of *cause* is shown to include negative sentiment as a part of its meaning, while the formal variant is neutral with respect to sentiment. I claim that the negative sentiment associated with colloquial *cause* is not a part of its asserted content, but is instead a variety of projective, not-at-issue meaning. In this chapter, it is suggested not only that *cause* has a richer semantics than has hitherto been appreciated broadly, but that by taking into account social and expressive components of meaning such as sentiment and register, a fuller picture of the meaning of event-structural predicates like causatives and verbs of becoming can be drawn, with predictive consequences in terms of inference and argument selection.

1.   Sentiment and the verb *cause*

Sentiment plays an important role in the meaning and consequent selectional behavior of the periphrastic causatives in English. Specifically, the selection of a causative verb seems to be influenced in part by the speaker's evaluative stance toward the result state or event denoted by the complement clause. To explore whether particular verbs favor positive or negative complements, in this section I apply felicity judgments regarding evaluative polarity as well as sentiment lexicon classifications to collocates in corpus sentences and compare those results to binary *good/bad* collocation preferences as reflected by Google's n-gram resource.[88] Based

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[88] http://books.google.com/ngrams. Note that although Google's n-gram measures word-sequence frequencies in books published in English for the last 200 years, to militate against large diachronic changes in meaning, all measures that follow encompass only those books published between 1950 and 2000.

on these tendencies, more detailed and targeted experiments are described, which establish negative speaker sentiment as a robust semantic/expressive feature of the otherwise general causative verb *cause*.

1.1 The Meaning of *Cause*: preliminary observations and a hypothesis

The verb *cause* evidently carries a negative connotation, which has not, to my knowledge, been noted prior to Childers (2013). This fact is surprising in light of its neutral term of art status in disciplines like philosophy and physical science, as well as its use as the name for the semantic primitive in lexical decompositional theories. Nevertheless, it is clearly best with negative outcomes:

(160) a. Who caused this horrible disaster?
      b. ??Who caused this delightful surprise?

This tendency is borne out in sentences from the Corpus of Contemporary American English (COCA - http://corpus.byu.edu/coca/):

(161) a. "...assess the damage caused by the burning oil wells."
                                              (ABC_Nightline, 1991)
      b. "...changes of job and heart had caused some wear and tear on the
          relationships."   (Bk: Romantics, 2008)
      c. "The things you didn't do are likely to cause the most regret."
                                              (Prevention, 2006)
      d. "Divorce caused tumult, but didn't make a lasting impression, good or
          bad."   (USA Today, 2002)

In (161a), *cause* is used with a state of physical damage and is contrastive with a sentence such as ??*...assess the repairs/improvements caused by the workers*, in which a positive sentence is no longer felicitous with the verb. In (161b), the physical

damage scenario is extended metaphorically to relationship health, and in (161c) *cause* introduces a negative emotional state. Example (161d) is particularly illuminating in that it contains both the *cause* and *make* causative verbs, showing the contrast between the negative 'tumult' complement of the former with the neutral complement of *make*, 'lasting impression,' which is explicitly identified as non-evaluative via a direct denial that it is either good or bad.

When used in some contexts, *cause* can occur with sentiment-neutral complements, as the sentences in (162) demonstrate:

(162) a. "Humidity causes it to curl and turn back."
                                                        (Atlanta, 2009)
       b. "...ultrahigh-frequency sound waves could be used to cause air to bend light."   (TechReview, 2002)
       c. "Oxidation, the same chemical reaction that causes sliced apples to turn brown."   (MensHealth, 1994)

These sentences all involve physical causation without negative connotations. Each provides a physically descriptive, non-evaluative context for which *cause* seems to have a specialized neutral meaning. The possibility that this represents a separate, register-specific sense is discussed in section 3 below.

In its core usage, it seems that *cause* is more general than many of the other periphrastic causatives discussed in the previous chapter, except for its associated inference of negative sentiment. Like *make*, modulo sentiment, *cause* is an available paraphrase for effectuating causative verbs:

(163) a. Mary got Bill to make a terrible mistake
               → Mary caused Bill to make a terrible mistake

       b. Mary had Bill commit the crime
               → Mary caused Bill to commit the crime

  c. Mary forced Bill to cheat the customers
       → Mary caused Bill to cheat the customers

And, unlike *make*, *cause* can also paraphrase negative sentiment enabling causatives:

(164)   Bill let the criminal escape → Bill caused the criminal to escape.

Based on these judgments, it seems that, absent sentiment, non-formal *cause* is indeed the general causative verb that has been proposed.

  A hypothesis is that the negative sentiment of *cause* is associated with the affective state of the speaker of the sentence, rather than that of any argument of the verb. In particular, I propose that the sentiment is that of the speaker rather than the subject of the sentence. Suppose Mary is unethical and recruiting for a scheme:

(165)   Mary caused Bill to participate in her nefarious plot.

In this sentence, it is presumably the speaker, rather than Mary, who is critical of Mary's plot. It further seems that negative sentiment is more like a condition of use (like a semantic harmony condition of some kind) rather than something that is intentionally expressed by the speaker. This intuition is based on obscurity of this meaning to introspection on the meaning of *cause*, which might suggest that it is not intentionally selected for an expressive purpose. In this way *cause* differs from expressives, slurs, and epithets:

(166) a. This damn computer is too slow.
   b. That honky Bill is always complaining.
   c. Jim is one stupid bastard.

For the sentences in (166), *damn*, *honky*, and *bastard*, respectively, are explicitly and intentionally used by the speaker to express some intensity of emotion or evaluative

stance. This does not seem to be the case with *cause*. If I am told about some event that *John caused it to happen*, I do not assume that it is a part of the speaker's intent to inform me of her negative sentiment toward the event, even if I am able to infer that sentiment based on her use of the word. In that way, *cause* differs as well from words that have negative sentiment as an apparent part of their asserted, at-issue content, like *sloppy*, *disgusting*, or the pre-adverbial excess particle *too* as in *he's driving too fast* or *he's driving too slow*. For these lexemes, negation of the evaluative stance results in falsity.[89] Reflection suggests that when *cause* is used with positive speaker sentiment, as in (160b), the result is infelicity but not ungrammaticality, and expressive inappropriateness but not falsity. A fuller discussion of these intuitions and an attempt to characterize the nature of the meaning associated with *cause* is given in section 2 below.

1.2   Corpus Studies

In recent years, much work has been done and many technological advances have been made in the area of sentiment analysis. Machine learning and data mining techniques, in particular, have yielded powerful computational resources for the automatic classification of author sentiment in various domains (see e.g. Pang et al. 2002, Pang & Lee 2008, Hatzivassiloglou & McKeown 1997, Kennedy & Inkpen 2006, Blair-Goldensohn et al. 2008). In what follows, however, a rather more naïve

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[89] Negative sentiment of these kinds of words can sometimes be contradicted for poetic effect: "I wish they'd invent a cereal for someone who like it all floppy and drippy and droppy and lumpy and sloppy and soggy and gloopy and gooey and mushy and nice" ("Cereal", Shel Silverstein).

approach to sentiment classification is employed, in which the relative frequencies of right adjacent evaluative adjectives (*good* and *bad*) are compared for the verbs of interest as a means of gauging whether certain verbs have evaluative connotations as reflected solely by their selectional properties.

Prior to that study, though, data were collected to shed light on the general selectional behavior of the verb. In order to probe whether the verb *cause* expresses negative sentiment toward the caused subevent in naturally occurring sentences, I collected sentences from COCA containing tokens of *cause* followed by pronominal NPs[90] and an infinitival VP headed by *to*, similar to the collection method for the study described in chapter 2. As described there, COCA is a 450 million word balanced corpus, equally divided among spoken, fiction, popular magazines, news texts, and academic publications, as well as by year for each year from 1990-2015. In all, 1,853 sentences matched this frame. In order to get a general picture of collocation behavior, a search was then performed to gauge the frequency of the five most common complement verb stems for *cause* alongside the five most frequent complement verbs for the other periphrastic causatives discussed in chapter 2. The number of occurrences in the corpus of '[cause] NP to V' for each verb was then divided by the total number of verb complements of *cause* in that structure in the corpus, giving a frequency of each complement verb normalized by the total number of sentences matching the frame. This is not the optimal normalization procedure for looking at collocates of a single periphrastic, but it is useful for comparing

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[90] In particular, singular pronouns *me*, *him*, and *it*. Omitting *you* to restrict the search to singular subjects, and omitting *her* to avoid the homophonous possessive pronoun.

collocate frequencies across periphrastics, as is done below. A more useful and revealing normalization is described following that discussion.

The results for *cause* are given in figure 28 below. The bar graph indicates the frequency of occurrence of the verb as a proportion of all sentences collected. For example, the verb *be* was the most frequent, occurring in 119 sentences out of the 1853 sentences that match the '[cause] NP to [V]' frame, or 6.422% of sentences, as shown by the leftmost bar of the graph. As mentioned above, *cause* sometimes occurs in sentiment-neutral contexts. The most frequent verbal collocates of the verb across all COCA contexts, however, include the negative terms *lose*, *miss*, and *fall*:
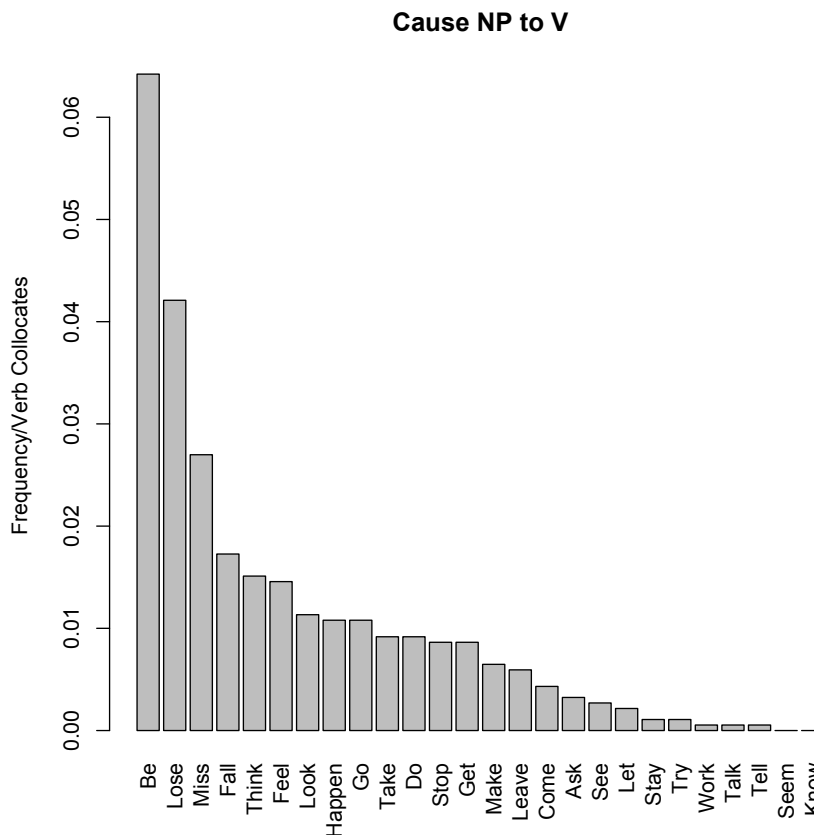
Figure 28: distribution of representative verbs occurring in the complement clause of *cause*.

A weighted average of sentiment scores for the collocate verb does, in fact, skew negative. Taking the difference of the positive and negative scores for each verb as determined by SentiWordNet - http://sentiwordnet.isti.cnr.it/index.php, and see description in Section 1.3 below – multiplying this by the proportional frequency of its occurrence with *cause* and summing these weighted sentiment scores gives a value of -0.018348624. Since this verb set represents frequent collocates for all causatives, most are associated with neither positive nor negative sentiment, which might explain why the negative skew for the verbs out of context is so slight even while the causative sub-events indicated by the corpus sentences in context for *cause* are so clearly negative.

A comparison of the selectional biases of the other periphrastics for some of the most frequent verb collocates of *cause* is given in the graph below. In this graph, collocation with the verb is given a percentage of collocation with all of the periphrastics examined here. For example, there are 78 examples of '[cause] me|him|it to [lose]' and 202 occurrences of '{periphrastic} me|him|it (to) [lose]' for any of the eight verbs on the x-axis, so collocation with *cause* represents 38.6% of the total of *lose* with the periphrastics examined here:

Lose/Miss/Fall as a Percentage of Collocation with all Causatives
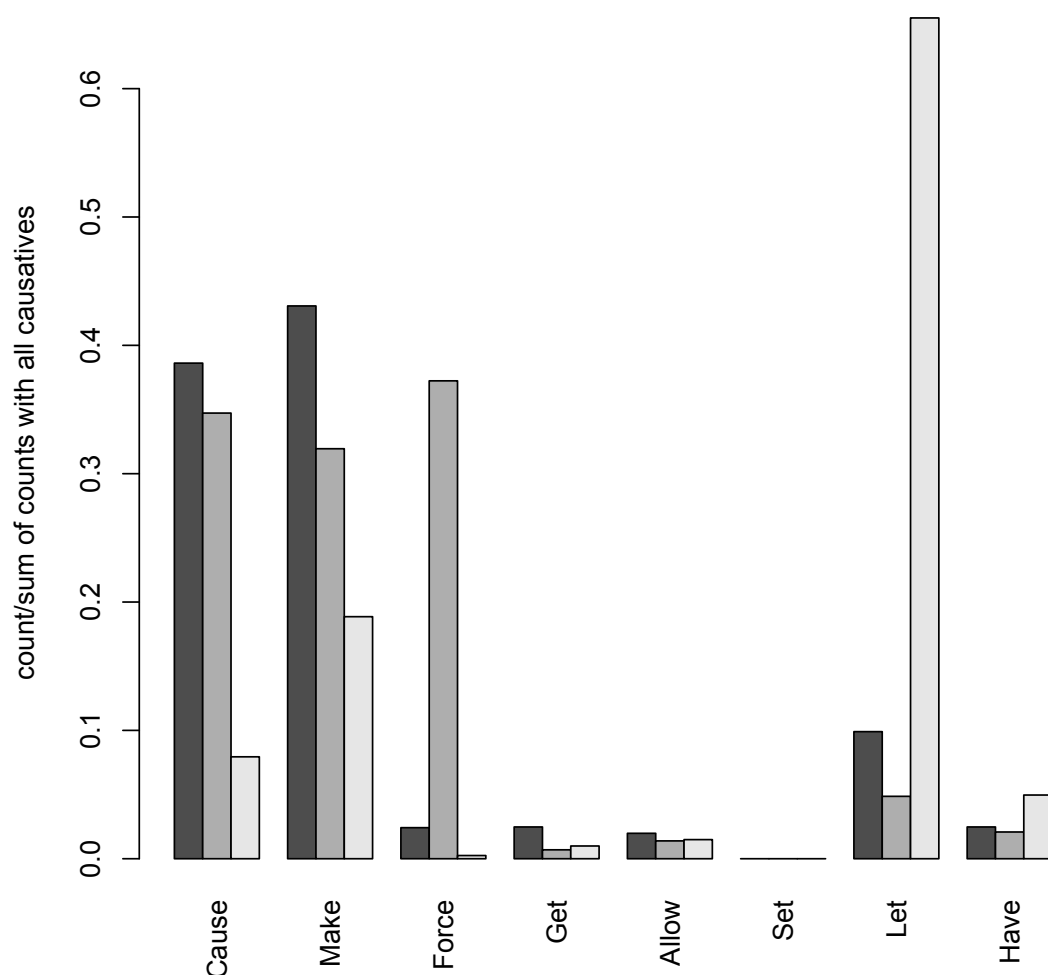
Figure 29: collocation of *lose* (black), *miss* (gray), and *fall* (white) with the periphrastics as a percentage of the total.

These data seem to suggest that *let* is preferentially selected by *fall* among these verbs by far. However, these numbers are skewed by the relative frequencies of the causatives themselves and *let* is by far the most frequent of these verbs in the periphrastic frame, even more frequent than *make*. For a more accurate picture of relative selectional preferences of the periphrastic verb, these data must be

normalized by the frequency of the periphrastic verb. Those data are presented in the graph below:

{periphrastic} NP (to) [lose/miss/fall]
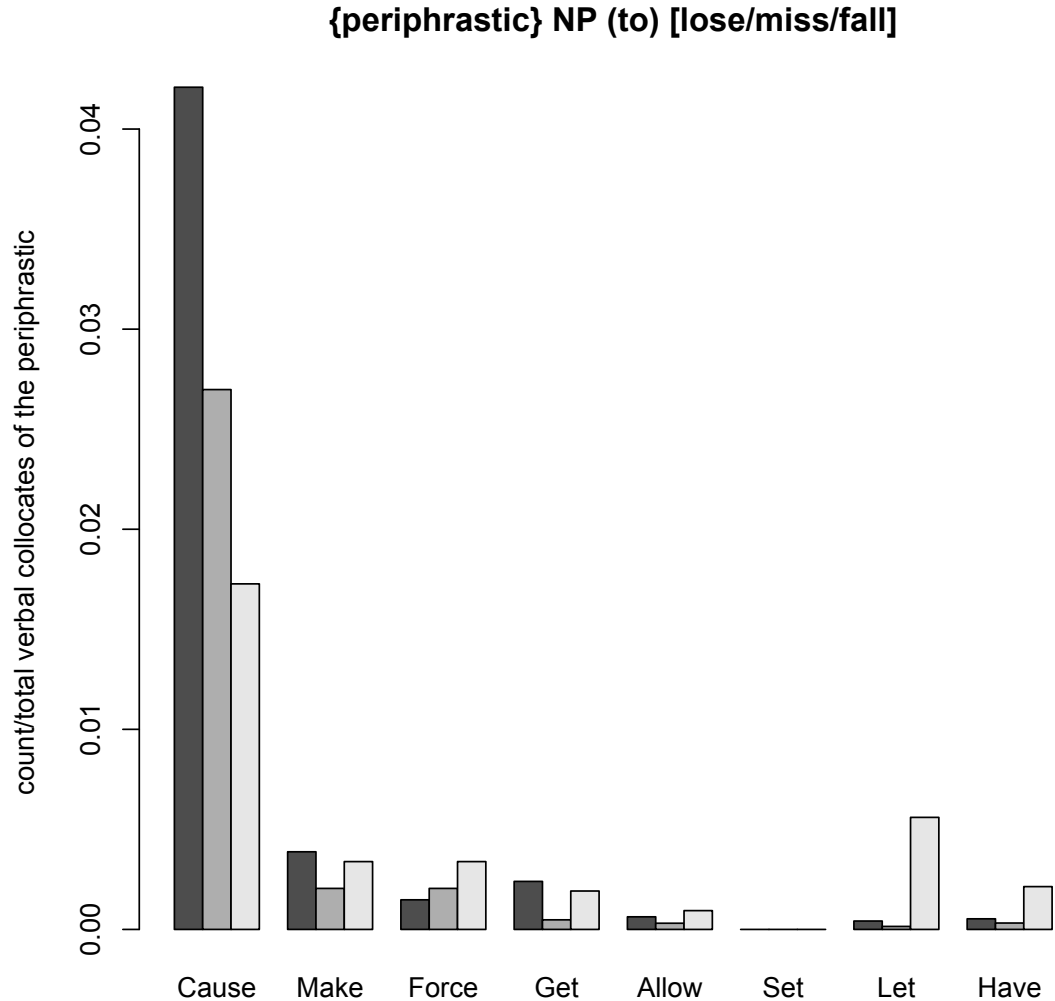
Figure 30: Frequency, normalized by periphrastic, for *lose* (black), *miss* (gray), *fall* (white).

These data show that *fall* preferentially selects *cause* first, and *let* second most among these periphrastic verbs. This graph illustrates that *cause*, much more than any other periphrastic causative examined here, is preferentially selected for by the negative verbs *lose*, *miss*, and *fall*.

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The results are even more clearly suggestive in terms of the negative sentiment selectional bias of *cause* when the verb collocates are normalized by frequency. A normalization procedure of this type is necessary to neutralize the effects on the results based on frequency of the collocate verb itself. In other words, this is a means of controlling for effects of frequencies of the comparison class. In the comparison graph above, the comparison class was the set of periphrastic verbs, so the normalization procedure neutralized the effects of their frequency. Here, when looking at the selection patterns of a single verb, *cause*, the comparison class is the set of collocate verbs, so their frequency should be normalized in order to get a clearer picture of selection preferences in terms of their meaning. For example, the adjective *good* (476338 occurrences in COCA) is much more frequent than *apocalyptic* (1239 occurrences in COCA) so it is not surprising that there are more occurrences of "[cause] good" (6) than "[cause] apocalyptic" (1). But it would be erroneous to draw semantic conclusions from this fact since the difference is likely an effect of the differences in frequency for the adjectives, rather than the selectional preferences of the verb. However, if we normalize by the adjective, the frequencies become $6/476338 = 1.259 * 10^{-5}$ for "[cause] good" and $1/1239 = 8.071 * 10^{-4}$ for "[cause] apocalyptic", showing the latter to be much more frequent proportionally. This would be a better measure of the selectional preferences of *cause* in terms of the meaning of its adjectival collocates.

In the graph below, counts of verbs in the '[cause] NP to V' frame are divided by the total number of their occurrences in the corpus. As described above, this is a procedure for neutralizing the effects of the frequency of the collocate verb in order

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to target the meaning biases in the selection pattern, rather than examining a selection pattern that might be an artifact of the frequencies of the selected words themselves. The verb *be* occurs 1,942,849 times in the corpus, so the occurrences in the complement of *cause* (119 occurrences) are 0.006125% of the total. There are 78 occurrences of the verb *lose* in the complement of *cause*, and only 36,208 total occurrences of *lose* in the corpus, so the occurrences in the complement of the periphrastic represent 0.215% of total occurrences, as shown by the leftmost bar in the chart below:

Cause NP to V
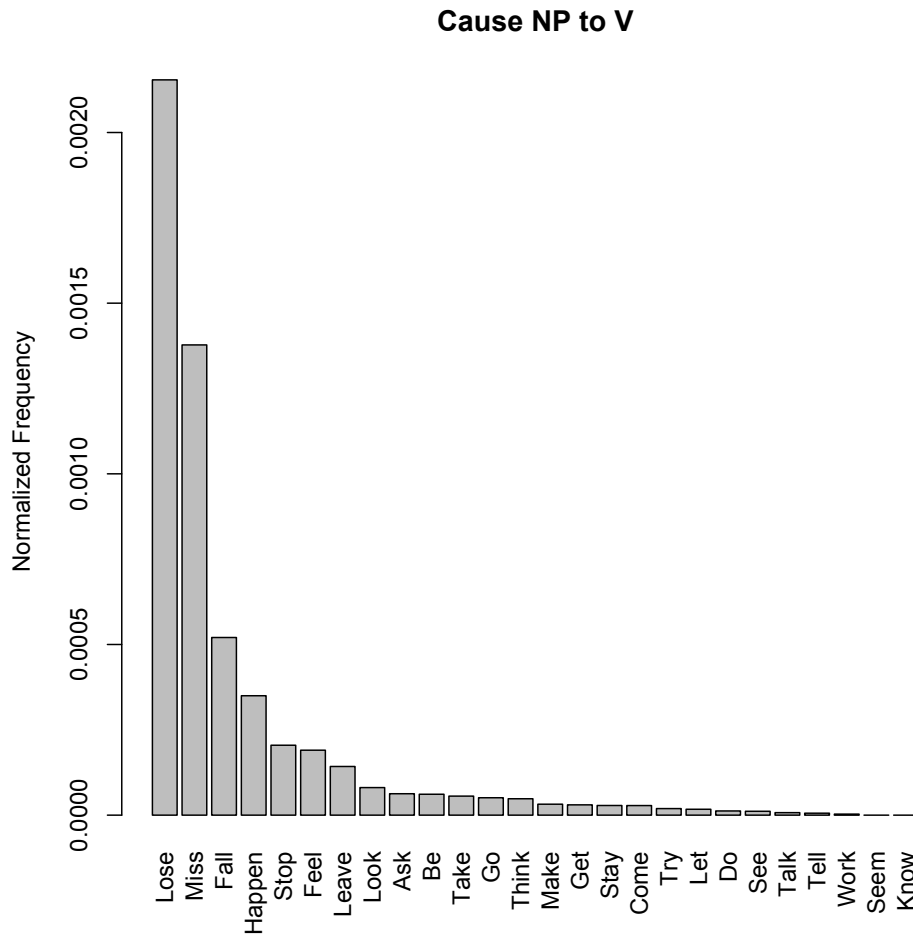
Figure 31: distribution of verbs occurring in the complement clause of *cause* normalized by frequency

With this normalization, *be* no longer dominates the selection preference ranking as a result of its high frequency. Instead *lose* is ranked as the most frequent, as a result of its high frequency with *cause* relative to its general frequency in the corpus. Under this normalization, *lose*, *miss*, and *fall* are shown to be highly favored by *cause.* Example sentences include the following:

(167) a. "...his daughter's murder has not caused him to lose faith in God or his works."

(Atlantic Magazine, 2015)

b. "...she continues to recover from stress fractures in her legs that caused her to miss almost half of last season."

(WashPost, 2007)

c. "...the policemen struck him in the head with a gun, causing him to fall to the floor." (ArabStudies, 2010)

These sentences are all non-controversially negative from the point of view of the writer.

In order to test sentiment across a larger corpus, the data below were gathered via Google's Ngram Viewer, which returns the percentage of n-grams (for "caused bad", then, the percentage of all two-word strings) in a half-trillion word corpus based on Google Books. By that measure, in published books the verb occurs more frequently with the clearly negative adjective *bad* than the clearly positive *good*.[91]

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[91] Note that here, as elsewhere, Google N-grams evaluates only sequences of words, and not hierarchical syntactic structure reflecting constituency. Most of the 'caused good/bad' tokens likely are the verb with the adjectival modifier of some noun phrase that is not included. One example, from a book published in 1995, is the sentence fragment "six commonly prescribed medications that **caused bad** allergic reactions for me."
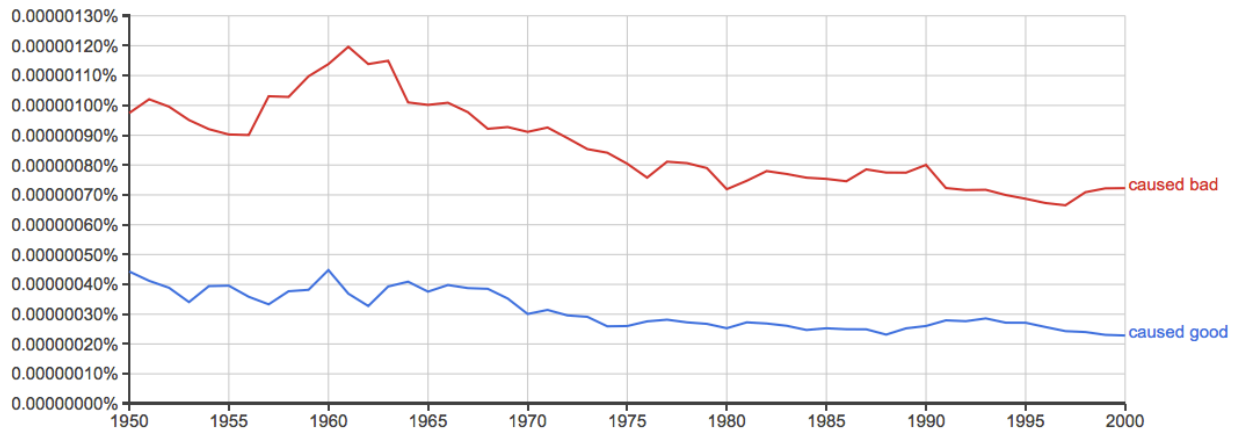
Figure 32: frequency of 'caused good' and 'caused bad' in Google's collection of published books 1950-2000.

This is despite the relatively greater frequency in the corpus of *good* across contexts:
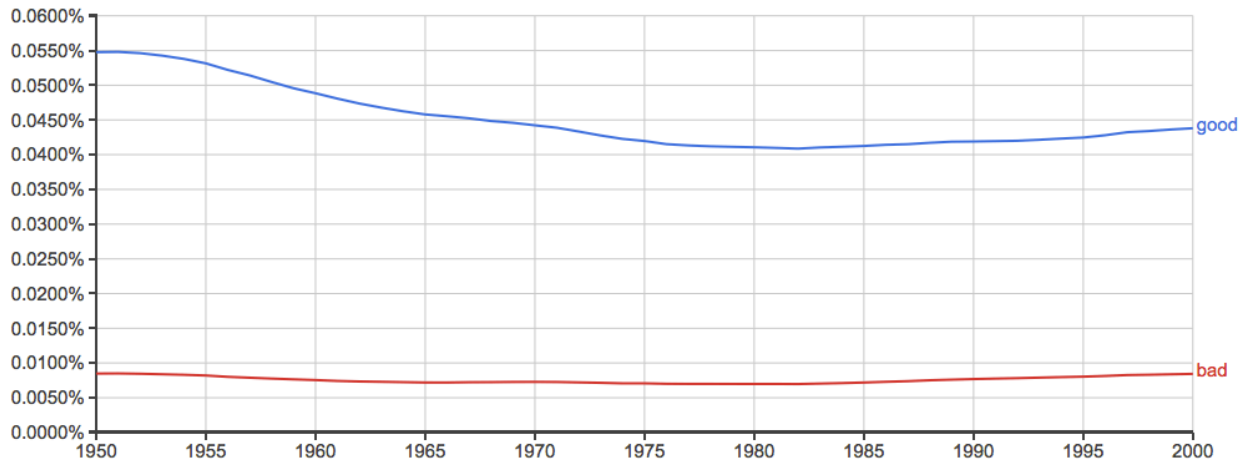
Figure 33: frequency of 'good' and 'bad' in Google's collection of published books 1950-2000.

The normalized values – for which the bigrams are divided by the total counts in the corpus of *good* and *bad*, respectively – illustrate significant differences in relative frequencies. In particular, the relative frequency with *bad* is around 17 times higher than the relative frequency with *good* in 2000:

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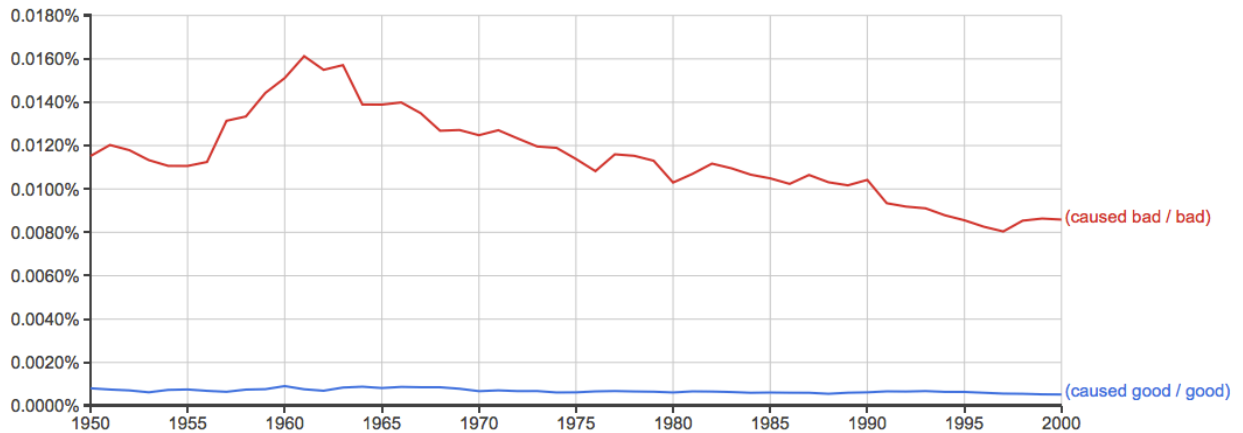
Figure 34: normalized frequency of *caused good* and *caused bad* – normalized by total counts of *good* and *bad*, respectively – in Google's collection of published books 1950-2000.

As shown in Figure 34, *cause* occurs with *bad* proportionally much more than with *good*, which, when normalized by the frequency of *good*, is negligible. In comparison, other causative constructions more or less reflect the underlying frequency of the adjective:[92]
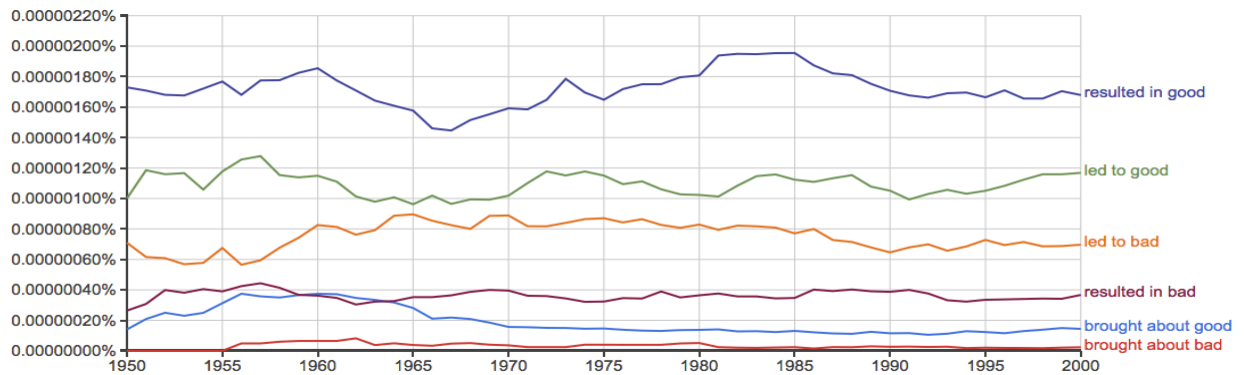
Figure 35: various causative constructions with 'good' and 'bad'.

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[92] It is worth noting that, when normalized, *led to* favors *bad* to *good*:
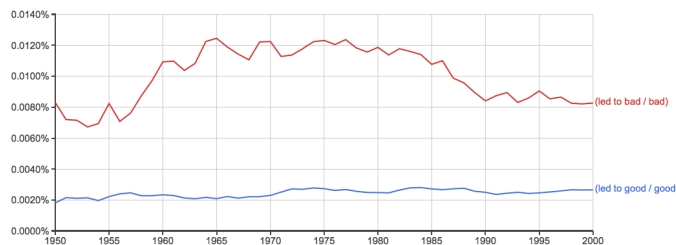
This is interesting and possibly indicative of a sentiment bias of the causative verb *lead*, but the possibility is not examined further here.

The graph above shows that other causative constructions, which are represented here by those headed by *resulted in, led to*, and *brought about*, are more frequent with *good* than with *bad*, which is consistent with the relative frequency of *good* and *bad* in the corpus, and unlike the distribution of *cause* with these adjectives.

When directly compared with *made*, the graph below shows that *caused* is better with the negative adjective *bad* independent of the frequency of the periphrastic causative verb:
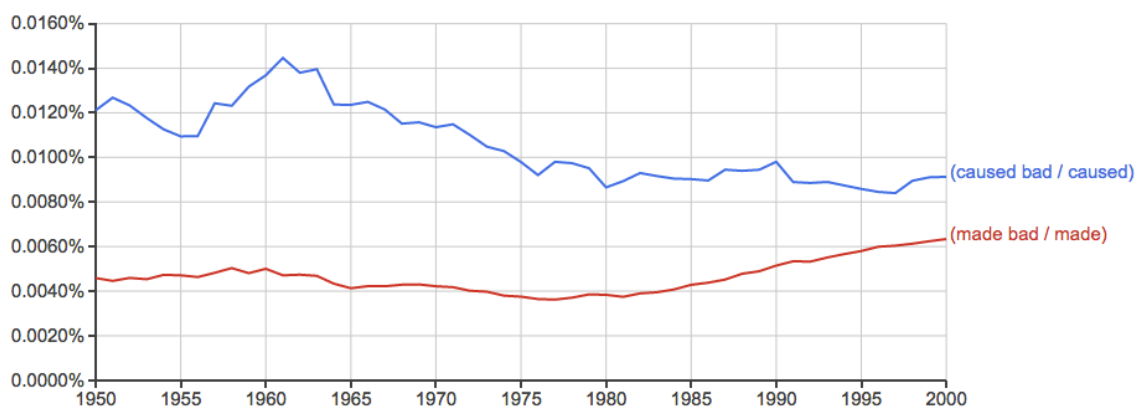
Figure 36: Relative frequency of *caused* and *made* with *bad*, normalized by total counts of *caused* and *made*, respectively.

And, unsurprisingly given the trends so far, *make* is much more frequent with the positive adjective *good* than is *cause*, which barely registers in the corpus when normalized by the frequency of the causative verb:[93]

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[93] Note the polysemy with the "construct" sense of *make*: *John made good birdhouses last week.* This felicitous possibility and the lack of grammatical tagging in the corpus mean these data are only suggestive as a direct comparison of the periphrastic causative verbs. More controlled investigations are described below.
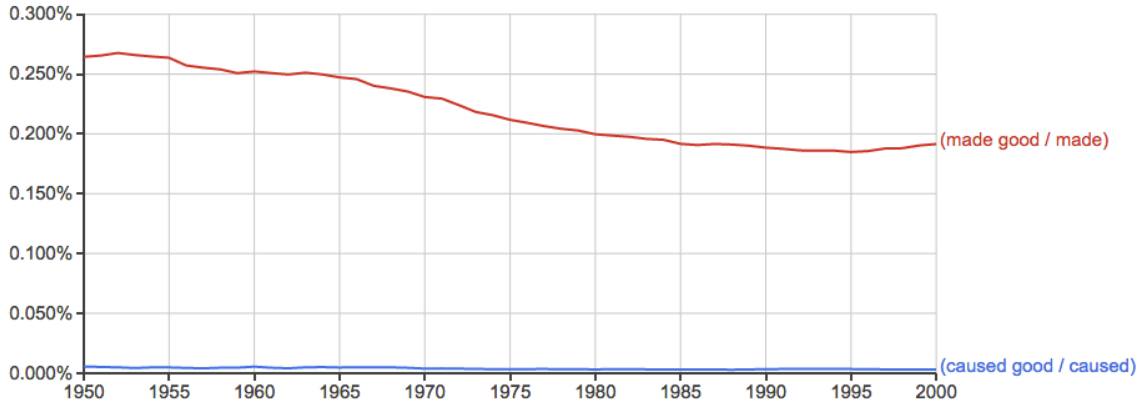
Figure 37: Relative frequency of *caused* and *made* with *good*, normalized by total counts of *caused* and *made*, respectively.

These trends are suggestive and appear to demonstrate a very strong bias for negative sentiment collocates with the verb *cause* that are explainable only in terms of the selectional behavior of that particular verb, rather than the relative frequencies of the adjectives used or the general behavior of causative constructions.

These data invite a more careful and controlled exploration of sentiment encoding of this seemingly neutral and sematically basic – even near-functional – lexeme *cause*. Although the corpus data seem to clearly demonstrate that *cause* favors negative sentiment, naturally occurring sentences in such large datasets are subject to any number of variables and potential confounds. To verify a negative sentiment bias, a more focused exploration is needed for a single uniform construction type, from which quantitative conclusions can be drawn and to which statistical tests can be applied. An attempt at such an exploration is described in the following section.

1.3 *Cause* and *Make* Experimental Findings

Two blocks of elicitations were performed to determine the potential sentiment bias of the periphrastic causative verb *cause* as compared to the hypothesized sentiment-neutral verb *make*. Although the second block is the more sophisticated of the two and represents a correction and refinement of the problemmatic first block, both are described here in order to illustrate both the rationale behind the approach and the subtlety of the dimensions of meaning for the verbs examined here. The two experimental results also provide evidence for a sense distinction that will be discussed in section 3.3.

1.3.1   First Experimental Block

The first experimental block compared *cause* and *make* in minimal frames in order to gauge what, if any, evaluative meaning is introduced by the verbs themselves. These frames were later found to introduce sentiment-relevant biases that required correction, as described in 1.3.2 below. In this section, this initial set of experiments is described and their results presented.

1.3.1.1   Methodology

In order to isolate sentiment from context, twenty (20) native or proficient English speakers were recruited to supply adjectives in a hypothesized sentiment-neutral frame. The instructions were as follows: "Please give three appropriate (natural sounding) adjectives for the position in each of the sentences indicated by

the blank," followed by three blanks underneath each of the following sentences, presented in random order:

> John caused the very _____ event to happen.
> John made the very _____ event happen.

This produced sixty (60) adjective tokens for each verb, with forty-six (46) unique adjectives for *cause*, forty-eight (48) unique adjectives for *make.* Seventeen (17) adjectives were given for both *cause* and *make*, resulting in a total of seventy-seven (77) unique adjectives elicited:

Cause		*Make*		All Adjectives		
bad (3)	random	annoying	interesting (4)	annoying	explosive	problematic
banal	recent	anticipated	large	anticipated	extraordinary	random
	same (2)					
beneficial		astonishing	long	astonishing	extreme	recent
chaotic	scary (2)	awesome	lovely	awesome	fluid	sad
crazy	serious	awkward	lucrative	awkward	fun	same
crucial	short	bad	magical	bad	futuristic	scandalous
detailed	small	big	positive	banal	good	scary
disasterous (2)	somber	bland	random	beneficial	grand	serious
dreadful	special	boring (2)	recent	big	happy	short
exciting (4)	strange (2)	calm (2)	sad	bland	horrible	small
extraordinary	successful	convoluted	scandalous	boring	important	smooth
	surprising (2)					
extreme		crazy (2)	scary	calm	improbable	somber
fluid	terrible (2)	cute	smooth	chaotic	interesting	special
fun (3)	troublesome	delightful	special (2)	convoluted	intriguing	strange
horrible	troubling	difficult (2)	successful	crazy	joyous	successful
important	unexpected	droll	surprising	crucial	large	surprising
improbable	unique	elegant	unlikely	cute	late	terrible
interesting	unlikely	exciting (3)	unusual	delightful	long	troublesome
			wonderful (2)			
intriguing	unusual	exclusive		detailed	lovely	troubling
joyous	wild	explosive		difficult	lucrative	unexpected
late		fun		disasterous	magical	unique
memorable (2)		futuristic		dreadful	memorable	unlikely
new		good		droll	new	unusual
nice		grand		elegant	nice	wild
painful		happy (2)		exciting	painful	wonderful
problematic		important(2)		exclusive	positive	

Figure 38: Experiment block 1 elicited adjectives.

The elicited adjectives were then presented in random, varying order to forty-three (43) native or near-native English speakers, who were asked to rate the positivity or negativity of the adjectives on a 7-point Likert scale. A sample fragment of the questionnaire is reproduced below:

Please rate the following adjectives in terms of their negativity or positivity by circling a number between 1 and 7; with 1 indicating a very negative adjective, 4 indicating a neutral adjective, and 7 indicating a very positive adjective.

	NEGATIVE						POSITIVE
interesting	1	2	3	4	5	6	7
calm	1	2	3	4	5	6	7
extraordinary	1	2	3	4	5	6	7
chaotic	1	2	3	4	5	6	7
painful	1	2	3	4	5	6	7

Figure 39: Sentiment Likert questionnaire stimulus sample.

These data were also checked against the sentiment lexicon SentiWordNet (http://sentiwordnet.isti.cnr.it/index.php), a semi-supervised sentiment classification of WordNet senses. SentiWordNet automatically classifies words in WordNet synsets of well-known seed sets of positive, negative, and neutral words and assigns a score for each of the three paramaters summing to one (1) for each

word based on averages of classifications (see Baccianella et al. 2010 for description). To get a single numerical value for each of the adjectives for simplicity and in order to have a direct analog to experimentally obtained sentiment scores, negative values were subtracted from positive values, resulting in a range of values [1,-1]. The raw SentiWordNet scores, along with all raw experimental results, are included in the Appendix.

1.3.1.2   Data and Analysis

The mean rating for adjectives given for the *cause* sentences was more negative than those given for the *make* sentences for both the experimentally elicited sentiment rankings and the SentiWordNet-based scores, but only for the SentiWordNet scores was the difference statistically significant ($p < 0.05$). The difference between the means of the experimentally elicited ratings is below:
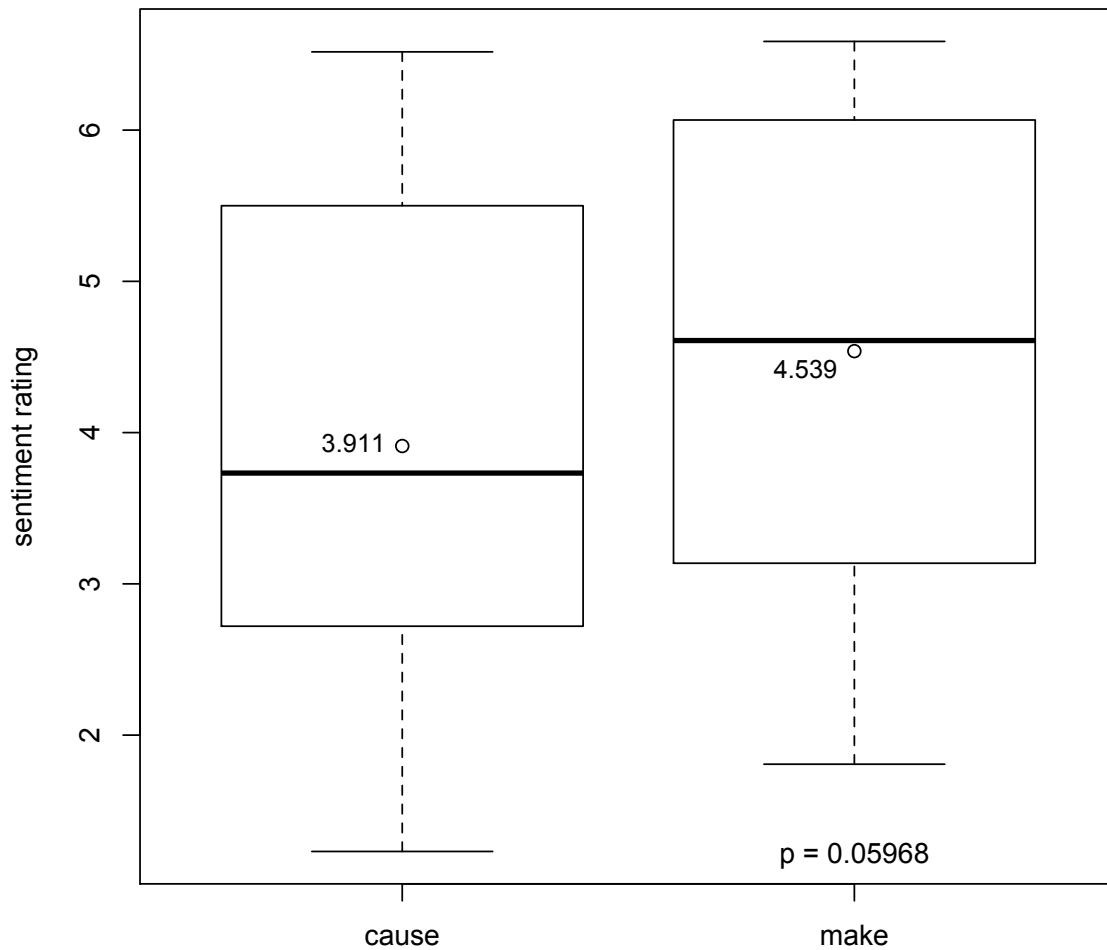
Figure 40: Boxplot for experimental sentiment ratings of block 1 elicited adjectives.

In Figure 40, paired boxplots showing quartiles of sentiment ratings for adjectives given in the *cause* and *make* sentence frames are given. Mean sentiment rating is indicated by the open circle and the p-value, a measure of the probability that the difference of means is due to chance, is given in the lower right corner of the figure. Although the ratings indicate that *cause* adjectives are on average more negative

than *make* sentences, this difference failed to reach a common measure of statistical significance, since p > 0.05.

As described above, the adjectives given by the experimental subjects were also checked against the sentiment values in the online sentiment lexicon, SentiWordNet (http://sentiwordnet.isti.cnr.it/index.php). An example of one such sentiment score, for the adjective *painful*, is given in the figure below:
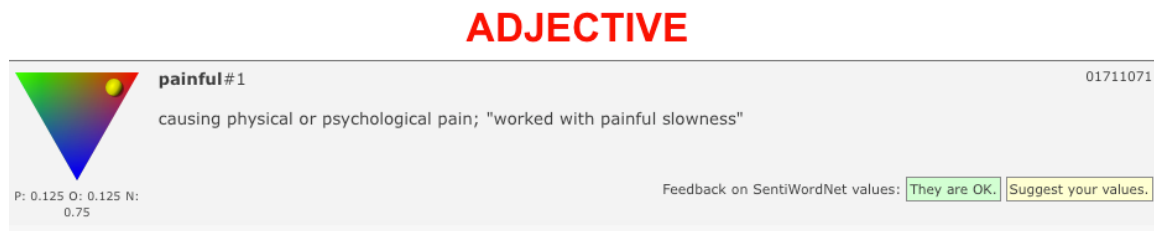
Figure 41: Example of SentiWordNet sentiment scores.

As mentioned, each word in SentiWordNet is given three values: a positive sentiment score (p), a negative sentiment score (n), and an objective (neutral) sentiment score (o). In order to obtain a single number comparable to the experimentally obtained ratings, the negative score was subtracted from the positive score (p – n), and these numbers were collected for all elicited adjectives from the *cause* and *make* sentences (see 1.2.2 below for discussion of correlation of the two measures and see Appendix for all raw data).
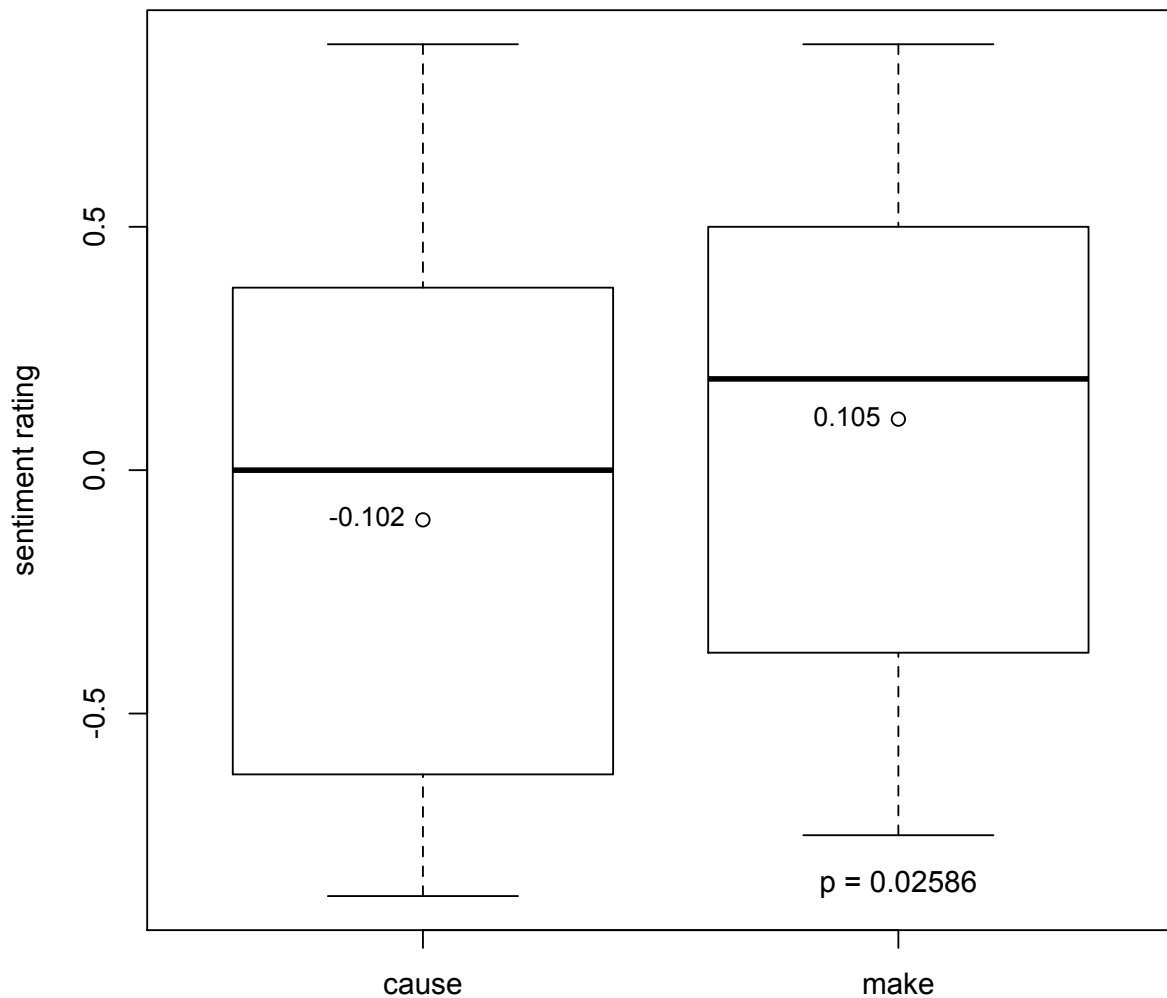
Figure 42: Boxplot for SentiWordNet sentiment ratings of block 1 elicited adjectives.

As was described for figure 40 above, mean sentiment ranking is indicated by the open circle and the p-value is given in the lower right corner of the figure. Unlike for the experimentally obtained ratings, the difference between the mean of SentiWordNet values for the *cause* and *make* does reach statistical significance (p < 0.05). However, this is less robust than expected given the clear difference observed

in the corpus. One explanation for this is that there might be confounds in the sentence frames themselves. To explore this possibility, a second block of experiments was performed.

1.3.2   Second Experimental Block

Guided by a hypothesis that the data were being skewed by both a formal register bias, triggered by the inclusion of the word *event* (see section 3 below for discussion), and by the presence of the definite article *the*, which has been independently shown to favor neutral sentiment (Davis and Potts 2009), modifications were made to the experimental materials for a second block of adjective elicitation, described in this section.

1.3.2.1   Methodology

To correct for suspected formal register and neutral sentiment biases, the sentences described in section 1.2.1 above were altered from "John V-ed the very _____ event to happen" to the following sentence frames:

John caused a very _____ thing to happen.
John made a very _____ thing happen.

Three (3) adjectives for each verb were collected from eighty-three (83) native or proficient English speakers. This produced two hundred forty-nine (249) adjective tokens for each verb, with eighty-four (84) unique adjectives for *cause* and sixty-

nine (69) unique adjectives for *make*. Thirty-seven (37) adjectives were given for both *cause* and *make*, resulting in a total of one hundred sixteen (116) unique adjectives elicited:

Cause			Make			All Adjectives			
absurd	frightening (3)	scary (7)	abnormal	good (34)	scary (4)	abnormal	dumb	interesting	serious
amazing (2)	fun	serious	adventurous	great (5)	significant	absurd	exciting	intriguing	shocking
annoying	funny (2)	shocking	amazing (5)	happy (3)	small (2)	adventurous	exotic	kind	significant
awe-inspiring	good (15)	silly	awesome (2)	hateful	special (2)	amazing	explosive	lame	silly
awesome (2)	great (2)	simple	awful (3)	heinous	strange (12)	annoying	extraordinary	large	simple
awful (5)	happy (3)	small	bad (22)	helpful	substantial	awe-inspiring	extravagant	loud	small
awkward	horrible (6)	special	beautiful (2)	horrible (4)	surprising (6)	awesome	extreme	lovely	special
bad (46)	huge	spontaneous	big (9)	hurtful	terrible (3)	awful	fantastic	meaningful	spontaneous
beautiful	important	strange (13)	bitter	important (6)	ugly	awkward	fascinating	mischeivious	strange
big (4)	influential (2)	stressful	boring	incredible	unexpected (2)	bad	fortuitous	natural	stressful
bizarre	innocent	surprising (7)	consequential	inspiring	unusual (2)	beautiful	fortunate	negative	substantial
catastrophic	interesting (10)	terrible (7)	convenient	interesting (17)	weird (15)	big	frightening	nice	surprising
cool (2)	intriguing	terrifying	cool (8)	kind	wonderful (3)	bitter	fun	normal	terrible
crazy (2)	lame	tragic	crazy (3)	large		bizarre	funny	novel	terrifying
dangerous (2)	loud (2)	troubling (3)	creative	loud (3)		boring	generous	obnoxious	tragic
delightful	meaningful	ugly	curious	lovely		catastrophic	good	odd	troubling
destructive	negative	unexpected (8)	dangerous (3)	meaningful		consequential	great	optimistic	ugly
detrimental (3)	normal	unfortunate (5)	delightful (2)	mischeivious		convenient	happy	outrageous	unexpected
disastrous (2)	novel	unkind	dumb	natural		cool	hateful	peculiar	unfortunate
disturbing	odd (5)	unnatural	exciting (11)	nice (6)		crazy	heinous	perplexing	unkind
dramatic	optimistic	unnecessary	exotic	obnoxious (2)		creative	helpful	pleasant	unnatural
exciting (9)	outrageous	unpleasing	extraordinary	odd		curious	horrible	popular	unnecessary
explosive	peculiar (2)	unthinkable	extravagant	peculiar		dangerous	huge	positive	unpleasing
extreme	pleasant	unusual (3)	fortunate	perplexing		delightful	hurtful	rare	unthinkable
fantastic	popular	upsetting	frightening	positive (2)		destructive	important	reasonable	unusual
fascinating	reasonable	weird (7)	fun	rare		detrimental	incredible	remarkable	upsetting
fortuitous	remarkable	wild	funny (5)	ridiculous (2)		disastrous	influential	ridiculous	weird
fortunate	sad (5)	wonderful (2)	generous	sad (4)		disturbing	innocent	sad	wild
						dramatic	inspiring	scary	wonderful

Figure 43: Experimental block 2 elicited adjectives

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SentiWordNet-based scores were collected for these adjectives and solicited sentiment ratings from the previous experiment were, when available, applied to the new adjective sets. The scores for the adjectives across the experimental and SentiWordNet ratings had a correlation of 0.7574034, indicating a strong agreement between the two measures. A plot of the two measures with a regression line is below:[94]
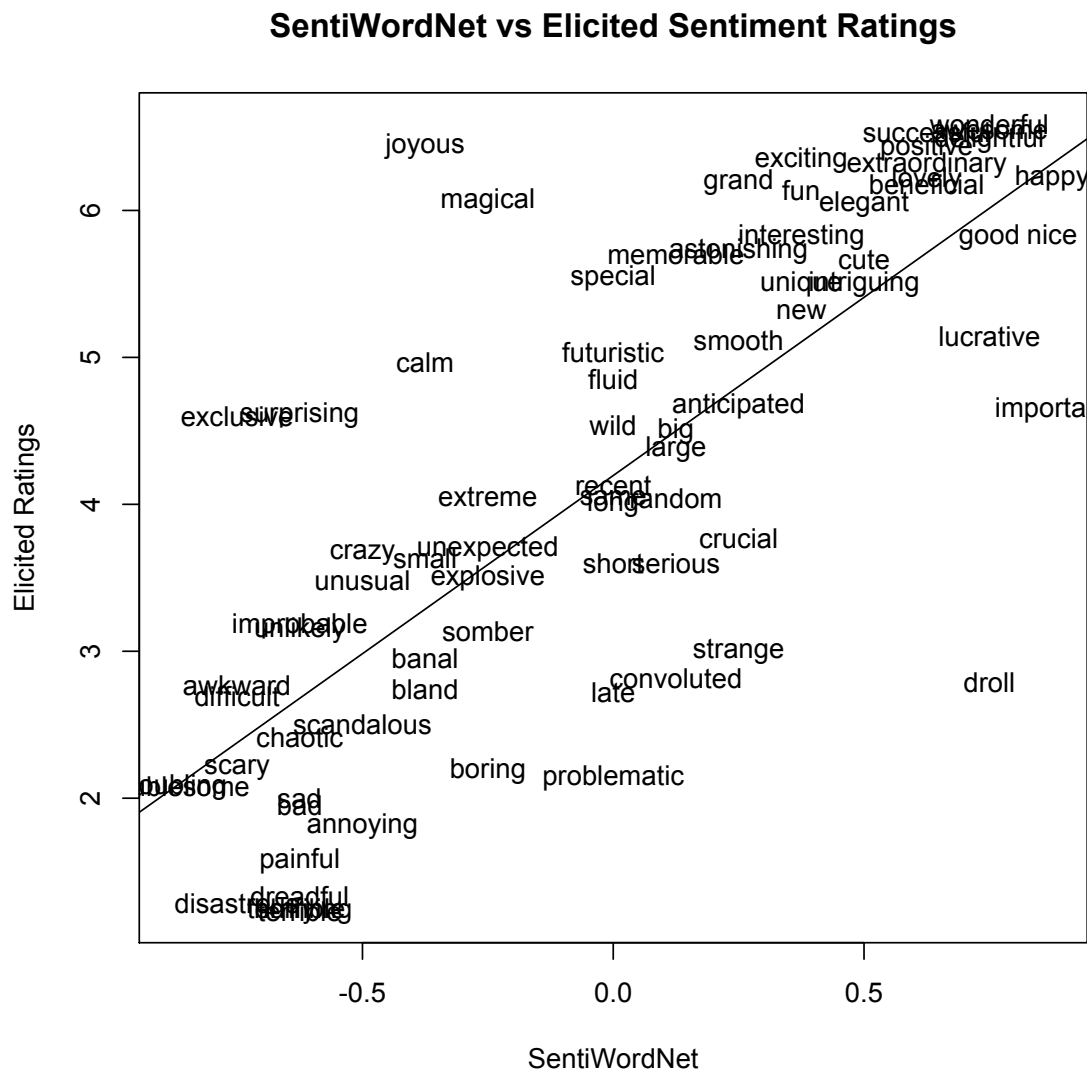

Figure 44: elicited sentiment ratings plotted against SentiWordNet scores with regression line.

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[94] The linear relation between the data is highly significant (p = 1.568e-15) and the regression line has a high explanatory value for the data (R^2 = 0.5737)

This chart replaces points representing experimentally elicited scores (y-axis) and SentiWordNet scores (x-axis) for individual adjectives with the adjective itself. The extent to which these data fall on a straight line is a measure of the extent to which the two methods of evaluation agree. Although this can be difficult to read in places where words overlap (the ideal situation if agreement between the two measures is desired, with resultant bunching along the regression line), it is a useful visualization in terms of locating the words for which the two measures differ in their evaluation. In most of the cases for which there seems to be significant disagreement, represented by deviation from the regression line (*joyous, magical, problematic*), the experimental results are more intuitively accurate than the SentiWordNet scores (*joyous* and *magical* are not negative, *problematic* is not neutral). One major exception is the positive word *droll*, which experimental subjects rated as negative. A possible reason for this is unfamiliarity with the word combined with sound symbolic associations with, e.g. *dull, dreadful*. The significance of the regression line (p = 1.58e-15) and the fact that the majority of the words lie on or close to it, however, shows that the two methods generally agreed in their relative sentiment ratings for these adjectives.

1.3.2.2   Data and Analysis

By both methods, adjectives in the *cause* sentence frame were more negative than those in the *make* sentence frame, and the difference was found to be highly significant:
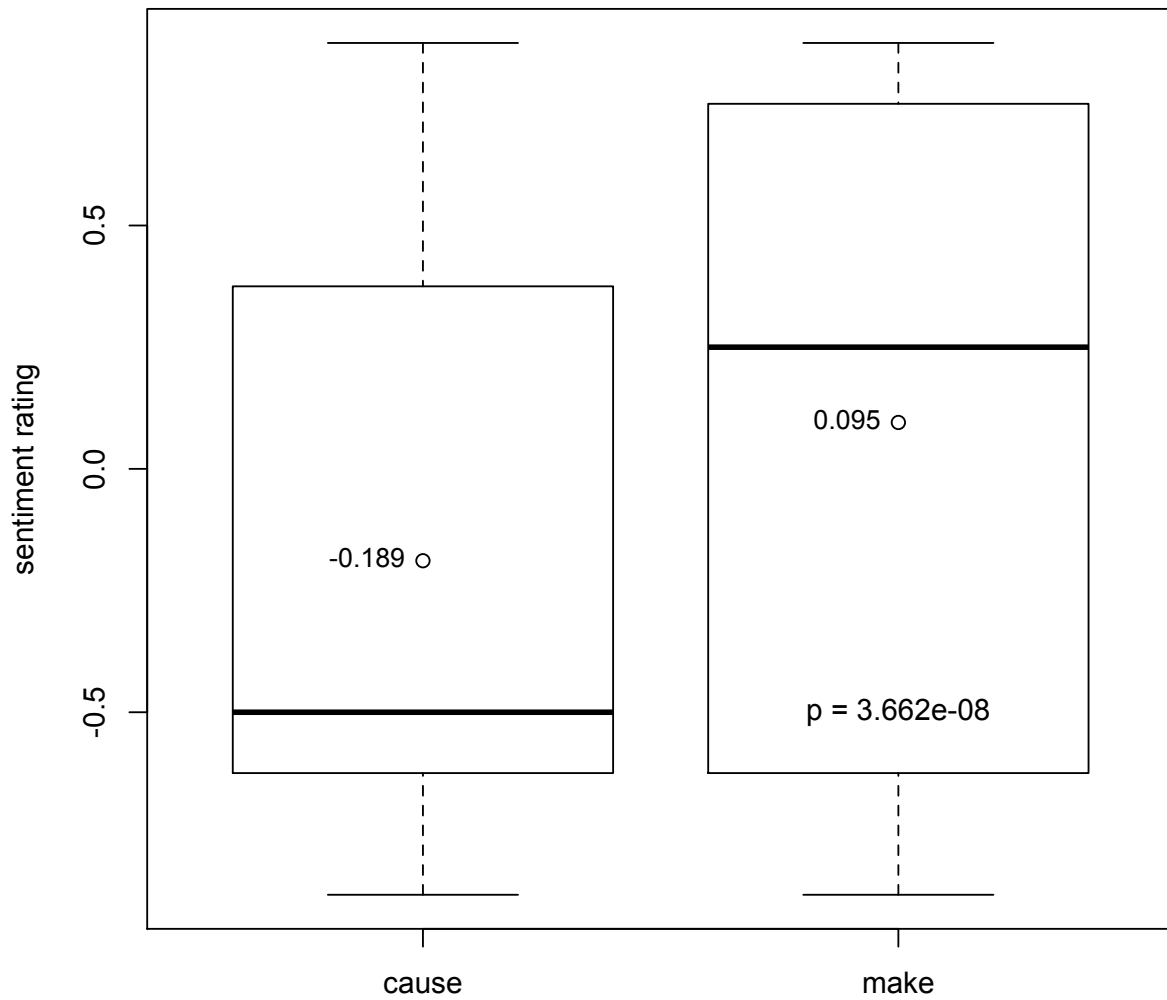
Figure 45: Boxplot for SentiWordNet sentiment ratings of block 2 elicited adjectives
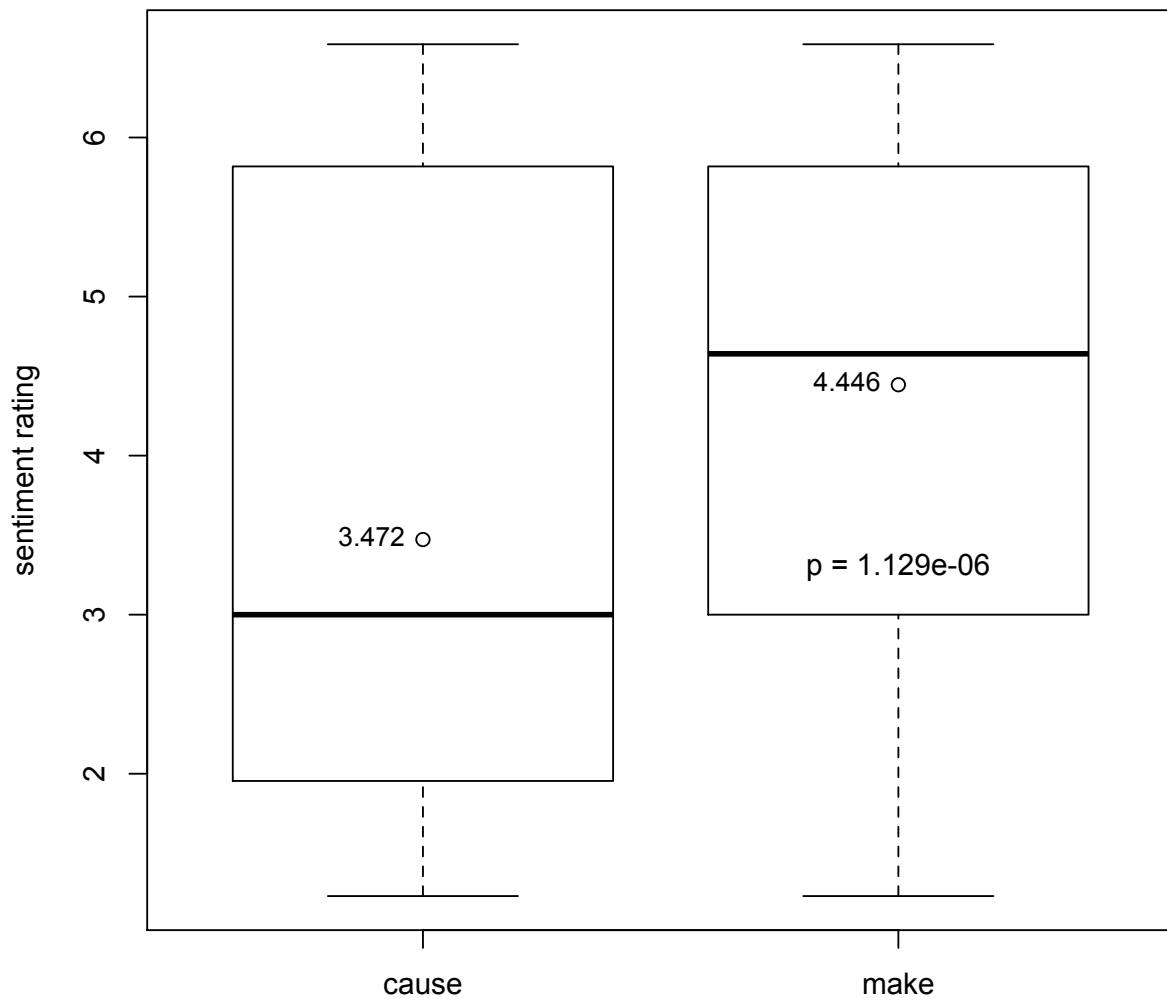
Figure 46: Boxplot for elicited sentiment ratings of block 2 elicited adjectives

As above, these charts give paired boxplots for the difference in sentiment scores for the adjectives with *cause* and *make*, with scores either obtained via SentiWordNet (figure 45) or experimentally elicited (figure 46) The wide difference between the boxplots for *cause* and *make* under both measures indicates that the collocate

adjectives for the two words differ widely in their associated sentiment, with adjectives in the *cause* frame significantly more negative than those in the *make* frame in both cases.

These data clearly demonstrate that *cause*, rather than representing a general causative verb as has been previously assumed, indicates negative sentiment on the part of the speaker toward the described subevent. In addition to a bare event-structural component of meaning, then, *cause* includes a kind of meaning – speaker sentiment – more commonly associated with expressives or slurs. However, the nature of the negative meaning demonstrated in this section seems to differ in several ways from that for expressives or slurs or other words of that kind. An attempt to discover and characterize just what kind of meaning the negative sentiment that is associated with *cause* is is the subject of the following section.

2.   Negative sentiment *cause* and varieties of projective meaning

Several outstanding questions regarding the sentiment encoding described in the previous section are related to the status of that meaning. In particular, is this meaning asserted or presupposed? Is negative sentiment entailed by the use of this verb, implicated by its use, or does it otherwise impose some limiting condition on its felicitous utterance?   In this section, the nature of the negative sentiment associated with *cause* is explored and shown to be a variety of projecting content.

This content is then examined within the framework of Tonhauser et al.'s (2013) taxonomy and determined to fit, albeit awkwardly, in the set they call "class B inferences". It is then claimed that negative sentiment is not entered into the common ground by the felicitous use of *cause*, with consequences in question answering and redundancy effects.

2.1 Projective content and the Family of Sentences

It is immediately clear that the negative sentiment associated with periphrastic *cause* as established in the preceding section is a projecting component of meaning, in that it survives certain entailment-cancelling environments:

(168)   John didn't cause it$_i$ to happen. #It$_i$ was a good thing.

In this sentence, *cause* is infelicitous with *a good thing* despite being embedded under negation: the negative sentiment is not cancelled by negation and is therefore said to "project" outside of this operator, or be "inherited" by it. The property of projection has historically been most frequently studied in connection with presuppositions (e.g. Horn 1972, Karttunen 1973, Karttunen & Peters 1975). It has been well established by these researcers and others that, simply put, "presuppositions survive in linguistic contexts where entailments cannot" (Levinson 1983, 191).   Entailments, for example, are cancelled by negation, while presuppositions survive it:

(169) a.   Fido is a beagle.
      b.   Fido isn't a beagle.
      c.   Fido is a dog.

      d.   John's dog is hungry.
      e.   John's dog isn't hungry.
      f.   John has a dog.

Among the sentences in (169), the following relationships hold: c follows from a, but doesn't follow from b, while f follows from either d or e. *Fido is a dog* is an entailment of *Fido is a beagle*, so it is cancelled by negation; *John has a dog* is a presupposition of *John's dog is hungry*, so it projects outside of negation. The possessive is a presupposition trigger. Other presupposition triggers include definite descriptions, which presuppose the existence of the entity, factive verbs like *realize*, which presuppose the truth of their complement, implicative verbs like *forget* or *manage*, which vary in their presuppostions, and various other lexemes and constructions (see Levinson 1983, 181ff).

Projection has also been observed for implications that are not the result of classical presupposition triggers, including non-restrictive relative clauses (Chierchia & McConnell-Ginet 1990, 351). Furthermore, projection occurs in other varieties of so-called conventional implicature such as epithets and appositives, as well as expressives (see Potts 2005):

(170) a.   If Bill, a big drinker, is here, we'll have fun.
        b.   If that son-of-a-bitch Bill left, he'd better not have taken the flower
               arrangement.   (Simons 2010, 311)

Both of these sentences contain something in the *if*-clause, which blocks entailments (see below), that is nonetheless implicated. In (170a), the proposition that Bill is here is cancelled, but the proposition that Bill is a big drinker is not. Similarly, in (170b), that Bill left does not follow from the sentence, but that Bill is a son-of-a-bitch (or that the speaker doesn't like Bill) is not blocked by the *if*-clause. Both the

content of the non-restrictive relative clause and the expressive content – however that is to be characterized – survive the embedding.

As defined in (Simons et al. 2010), "An implication *projects* if and only if it survives as an utterance implication when the expression that triggers the implication occurs under the syntactic scope of an entailment-cancelling operator" (Simons et al. 2010, 309). Using the (Chierchia & McConnel-Ginet 1990, 28; Tonhauser et al. 2013) "Family of Sentences" diagnostic, which makes use of a collection of such entailment-cancelling operators, negative sentiment seems to survive embeddings under negation, questions, *if*-clauses, and certain epistemic adverbs, all of which tend to cancel regular entailments:

(171) a.　　John caused the ??good/bad thing to happen.
　　　b.　　John didn't cause the ??good/bad thing to happen.
　　　c.　　Did John cause the ??good/bad thing to happen?
　　　d.　　If John caused the ??good/bad thing to happen, he should be located.
　　　e.　　Perhaps John caused the ??good/bad thing to happen.

In (171a) the existence of a good(bad) thing is presupposed, which is triggered by the definite determiner *the*.[95] The tests in (171b-e) demonstrate that there is a clash in the "bad thing" cases even when non-projective meaning is negated or otherwise unasserted, which is evidence that negative sentiment from *cause* is also projecting and clashing with the speaker sentiment associated with the presupposed "good thing" outside of the scope of the presupposition holes, negation etc. It is clear from these data that negative sentiment associated with *cause* is not an entailment, but is rather a variety of projecting inference.[96]

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[95] The neutral-sentiment bias of *the* described in the previous section seems to be overridden here by the appearance of the evaluative adjectives.

[96] And therefore not at-issue (see, e.g. Simons et al. 2010).

2.2 Tonhauser et al. (2013) and kinds of projective content

As mentioned above, there are many varieties of projective content in addition to standard presuppositions. The behavior of these varieties, and indeed the behavior of differently triggered presuppositions, is not uniform. This subsection introduces the properties of different projective content and reproduces a taxonomy of their types as developed in Tonhauser et al. (2013), which will be used as a framework for classifying negative sentiment *cause*.

2.2.1   Strong Contextual Felicity

One difference between different kinds of projecting content is whether or not there are requirements on the contexts that can license their use. If contexts relating to some inference *m* are defined as follows:

(172)   ***m*-positive and *m*-neutral contexts**

An *m*-positive context is an utterance context that entails or implies *m*. An *m*-neutral context is an utterance context that entails or implies neither *m* nor ¬*m*.

(Tonhauser et al. 2013, 75)

Then this constraint on contexts for utterances that trigger *m* is given below:

(173)   **Strong Contextual Felicity constraint**

If utterance of trigger *t* of projective content *m* is acceptable only in an *m*-positive context, then *t* imposes a Strong Contextual Felicity constraint with respect to *m*.

(Tonhauser et al. 2013, 76)

For example, it is infelicitous absent some context to say the following:

(174) a.   #I'm hungry, too.

    b.   #She's hungry.

Both the adverb/particle *too* and the use of a pronoun have conditions on their contexts, the former requiring a salient alternative satisfying the prejacent sentence, and the latter requiring some established co-referential individual. Tonhauser et al. propose the following diagnostic for Strong Contextual Felicity:

(175)   **Diagnostic for Strong Contextual Felicity**

    Let S be an atomic sentence that contains trigger t of projective content m.
    I.   If uttering S is acceptable in an m-neutral context, trigger t does not impose a Strong Contextual Felicity constraint with respect to m.
    II.   If uttering S is unacceptable in an m-neutral context and acceptable in a minimally different m-positive context, trigger t imposes a Strong Contextual Felicity constraint with respect to m.   (Tonhauser et al. 2013, 76)

Based on these criteria, the sentences above can be shown to have a Strong Contextual felicity constraint by putting them in an m-positive context:

(176) a.   Mary's hungry. I'm hungry, too.

    b.   Mary just arrived. She's hungry.

On the other hand, some projecting inferences don't have a Strong Contextual Felicity requirement on the utterance of their triggers:

(177) a.   John the mechanic is working on my car.

    b.   Mike's dog is always yelping.

    c.   John knows that the mailman comes at 2 PM.

In the first sentence above, the appositive (whose content is projective) can occur in neutral context, as can the possessive and the factive *know* in sentences b and c. Since no context at all is, of course, neutral with respect to any inference, these triggers meet the requirement for not imposing a Strong Contextual Felicity condition.

2.2.2   Obligatory Local Effect

The other criterion developed by Tonhauser et al. is that of Obligatory Local effect, defined as follows:

(178)   **Obligatory Local Effect**

A projective content *m* with trigger *t* has Obligatory Local Effect if and only if, when *t* is syntactically embedded in the complement of a belief-predicate *B*, *m* necessarily is part of the content that is targeted by, and within the scope of, *B.*

(Tonhauser et al. 2013, 93)

This criterion serves to identify presuppositions, for which *belief* predicates are traditionally called "plugs" (Karttunen 1973):

(179)   Mary believes that the tooth-fairy is 3 feet tall, but of course there is no tooth-fairy.

In this sentence, the existence of the NP in the definite description can be felicitously denied because the existence presupposition is only local to the *belief* clause. But Tonhauser et al. impose a stronger requirement than just that the implicature can be interpreted as local to the *belief* clause. They define Obligatory Local Effect as the

condition that the implicature is necessarily interpreted as local. The criteria developed for Obligatory Local Effect is a complex one, with several subdiagnostics:

(180) **Diagnostic for Obligatory Local Effect using belief-predicates**

Let S_1 be an atomic sentence with trigger t of content m.

I. **Trigger t imposes a Strong Contextual Felicity constraint with respect to m**: Let S be a sentence where S_1 is embedded under a belief-predicate. If utterance of S is acceptable when the utterance context entails m but the bearer of the attitude is explicitly ignorant of m, then the content m with trigger t need not have its effect locally, i.e. does not have Obligatory Local Effect.

II. **Trigger t doesn't impose a Strong Contextual Felicity constraint:** Three possible implementations:
    1. Let S_2 be an atomic sentence that implies $\neg m$, and S a sentence where both S_1 and S_2 are conjoined under the same belief-predicate. If utterance of S is acceptable, then the content m with trigger t need not have its effect locally, i.e. does not have Obligatory Local Effect.
    2. Let S_2 be an atomic sentence that implies $\neg m$. Embed S_1 under a belief-predicate with attitude holder A to form the complex sentence S'_1 and embed S_2 under the same belief-predicate with the same attitude holder A to form the complex sentence S'_2. Let S be a conjunction of S'_1 and S'_2. If utterance of S is acceptable, then the content m with trigger t need not have its effect locally, i.e. does not have Obligatory Local Effect.
    3. Let S_2 be an atomic sentence that contains both trigger t of content m and also implies $\neg m$. Let S be a sentence where S_2 is embedded under a belief-predicate. If utterance of S is acceptable, then the content m with trigger t need not have its effect locally, i.e. does not have Obligatory Local Effect.

III. **Trigger t doesn't impose a Contextual Felicity constraint with respect to m, but with respect to another implication n**: This subdiagnostic has the same three possible implementations as subdiagnostic II, with the addition that the context in which S is uttered entails that the speaker and the bearer of the attitude know n.
(Tonhauser et al. 2013, 93)

Note that every subdiagnostic above concludes with "If utterance of S is acceptable

[…], then the content m with trigger t need not have its effect locally, i.e. does not

have Obligatory Local Effect". These diagnostics do not provide for the identification of Obligatory Local Effect, only its absence, hence the following sentence, while suggestive, is not proof of Obligatory Local Effect:

(181)   # Mary believes that the tooth-fairy is 3 feet tall and that there is no tooth-fairy.

Similarly for the first sentence below:

(182) a.   # Jane believes that Bill has stopped smoking and that he has never been a smoker.
       b.   Jane believes that Bill, who is Sue's cousin, is Sue's brother.
                                                    (Tonhauser et al. 2013, 92)

However, (182b), which makes use of the II.1 subdiagnostic, demonstrates that non-restrictive relative clauses do not have Obligatory Local Effect according the diagnostics described.

There is a general difficulty with providing a positive diagnostic for Obligatory Local Effect, which is the result of the word *obligatory* and the impossibility of demonstrating necessity, rooted in Hume's skeptical critique of induction. It is analogous to the problem of negative evidence in language acquisition: there is no way to know that the next observation will not falsify your generalization. However, the notion does seem to be important in classifying triggers, and there are some that have inferences that do seem to be obligatorily local, or at least more preferentially local than others, as suggested by the placement of certain items below. The problem of proving positive Obligatory Local Effect will have some consequences for the classification of negative sentiment *cause*, as will be illustrated in 2.3 below.

2.2.3   A taxonomy of projective content

Based on the criteria of Strong Contextual Felicity and Obligatory Local Effect, Tonhauser et al. develop a taxonomy of projective content with four classes of content, exhausting the logical possibilities. The following table is reproduced from (Tonhauser et al. 2013, 67):

	Properties of Contents		
Classes	**Projection**	**Strong Contextual Felicity**	**Obligatory Local Effect**
A	yes	yes	yes
B	yes	no	no
C	yes	no	yes
D	yes	yes	no

Table 10: Four classes of projective content in English.

Some examples of triggers in English for each of these classes is given in the table below (adapted from Tonhauser et al. 2013, 103):[97]

Class	**Trigger**	**Content**
A	Pronoun	existence of referent
	too	existence of alternative
B	Expressive	
	Appositive	
	NRRC	
	that N	property attribution
	possessive NP	possessive relation
C	*almost*	polar implication
	know	content of complement
	only	prejacent implication
	stop	prestate holds
D	*too*	salience of established alternative
	Focus	salience of alternatives
	that N	speaker indicates suitable entity

Table 11: Classes and triggers of some projective contents.

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[97] NRRC = non-restrictive relative clause.

For example, the possessive relation triggered by possessive NP is a type B inference, since it has no Strong Contextual Felicity requirement and does not have an Obligatory Local Effect. The salience of an established alternative triggered by *too* is a type D inference, since it has a Strong Contextual Felicity requirement but no Obligatory Local Effect. Making use of the diagnostics above, this classification can be demonstrated by first showing the (in)felicity of the triggers in contexts that are neutral with respect to their inferences. The following sentences are to be interpreted as being uttered in a context in which it is not established that Mike has a dog or that there is some salient person that can dance well, respectively:

(183) a. Mike's dog is totes adorbs.
        b. # Mary can dance well, too.

Based on these judgments, since the possessive NP has no Strong Contextual Felicity requirement but *too* does, subdiagnostic I for Obligatory Local Effect should be used for the second sentence, and some variant of subdiagnostic II for the first. Here, subdiagnostic II.2 is used, which requires the trigger and the negation of the inference to be conjoined and embedded under the belief clause and both to have the same attitude holder:

(184) a. Jane sure loves dogs she runs into in the street but she doesn't pay much attention to their owners even if she knows them. She believes that Mike's dog is totes adorbs and that Mike doesn't have a dog.

        b. John probably never thinks about the famous Russian ballet dancer Vaslav Nijinsky anymore, but I remember him writing a glowing report on him in high school. Last week he was talking about his girlfriend Mary. He believes that Mary can dance well, too.

The felicity of these sentences demonstrates that neither inference trigger has Obligatory Local Effect, thereby justifying the classification of the projective content they trigger as class B and D inferences, respectively. Note that in (184b), John must be aware of the existence of other good dancers, since the existence of alternatives is a class A inference and has Obligatory Local Effect, but other good dancers need not be salient for him, which is the class D inference triggered by *too*.

2.3 Classifying negative sentiment *cause*

As noted in 2.1 above, the negative sentiment inference associated with *cause* is a clear case of projecting content, as demonstrated by the Family of Sentences diagnostic applied there. It is also immediately apparent that negative sentiment periphrastic *cause* lacks a Strong Contextual Felicity constraint (Tonhauser et al. 2013, 75 and see above) in that the verb with the associated inference does not require a specific context for felicitous use. For example, one can imagine a person walking into a room without prelude and declaring *I wish I knew who caused my morning to go the way it has* with clearly inferred negative speaker sentiment as a result. The lack of a Strong Contextual Felicity contraint imposed by *cause* on the negative sentiment implication is also demonstrated by the fact that inferences were evidently made from the minimal context experimental sentence frames as indicated by adjective selection in the elicitation experiments discussed above.

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Furthermore, unlike presuppositions, the sentiment also seems to survive plugs such as belief-clause embeddings, but this judgment is less obvious and is perhaps more controversial. To my intuition, the following judgments hold:

(185) a.　　Bill believed that John's cat was hungry, but John doesn't have a cat.
　　　 b.　　??Bill believed that John caused it to happen, but I enjoyed it.

It is likely that the effect – the negative sentiment inference triggered by *cause* – is sometimes or even typically interpreted locally to belief-type predicates, or that non-local readings can be somewhat strange out of context, as indicated by the marginal felicity of the sentence below:

(186) ??Bill believed that John caused it to happen and that it was wonderful.

However, there is some evidence that the local effect is not actually obligatory and can sometimes be solely associated with the speaker:

(187) I can't believe Bill's automatic sycophantic approval of everything John does. When he saw the ridiculous way the office was decorated in John's area, he mistakenly believed that John had caused it to look that way and that it was, therefore, a wonderful thing.

Indeed, the way the diagnostic criteria are set up, the possibility of a felicitous sentence of this type indicates that the effect need not be local. In particular, a sentence like that below nearly exemplifies the diagnostic criterion of type II.2 in (180) above, for a trigger without a Strong Contextual Felicity constraint:

(188) That idiot columnist believes that it was greed and corruption that caused our business$_i$ to fail$_j$ and that it was a good thing it$_i$ did$_j$.

The felicity of this sentence is suggestive with respect to the Local Effect of *cause*. A more accurate diagnostic, though, needs to be more precise about the statement of the negated inference. *Good* and *bad* do not represent the negation of one another, but are scalar adjectives representing polar opposites on some "goodness" scale.

Likewise for negative and positive sentiment. The negation of negative sentiment is not positive sentiment, but the lack of negative sentiment. The fact that some causative events can have mixed results, some positive and some negative, makes this distinction crucial. An appropriate application of subdiagnostic II.2 for Obligatory Local Effect needs to embed *cause* and the negation of its negative sentiment inference – lack of negative sentiment – under the *belief*-predicate together, with a single attitude holder:

(189) I keep telling Zach to stop changing his thesis, but he can't stop tinkering and seems not to have a problem with that. He also doesn't perceive his own primary role in the endless revising. Zach believes that David's presence on his committee causes him to change his thesis and that there's nothing wrong with him changing it.

(David Beaver, p.c.)

In this sentence, m is the negative sentiment inference with respect to Zach changing his thesis, t is the verb *cause*, S_1 is "David's presence on the committee causes (or *makes*) Zach change his thesis" and S_2 is "there's nothing wrong with Zach changing his thesis". S_2, of course, entails $\neg m$, the lack of negative sentiment with respect to the result (Zach changing his thesis). The felicity of this sentence suggests that the negative sentiment inference need not be local (to the belief-predicate), i.e. that *cause* does not impose an Obligatory Local Effect on the negative sentiment inference. If these are accurate judgments for English, then the negative sentiment associated with *cause* lacks either a Strong Contextual Felicity constraint or an Obligatory Local Effect, which places this particular variety of inferential meaning inamongst Tonhauser et al.'s Class B projective content along with

expressives, appositives, and non-restrictive relative clauses (see above and Tonhauser et al. 2013 pg. 103, Table 2).[98]

The felicity of example (189) does not in itself rule out the possibility that the verb *cause* in that example lacks projective content altogether (register effects make this possible, see section 3.3 below). To rule out that possibility, we can contrast (189) with an example in which the speaker lacks negative sentiment as well:

(190) I keep telling Zach to change his thesis as much as he thinks appropriate, and he keeps tinkering and seems not to have a problem with that either. He also doesn't perceive his own primary role in the endless revising. ??Zach believes that David's presence on his committee causes him to change his thesis and that there's nothing wrong with him changing it.

My intuitions about the felicity of the final sentence above are unstable in this context, although it seems odd. If it is felicitous for some speakers, then this test for Obligatory Local Effect is not determinative for non-categorical meaning biases of the type examined here. Sentences of the type in (190) get worse for me when the attitudes toward the caused subevent are explicitly and unambiguously positive for both speaker and believer. In any case, strict application of the diagnostic places negative sentiment as a Class B projective inference of *cause* and it is that categorization that is assumed here.

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[98] It is possible that there is a real obligatory local effect with this verb, however, since these examples are so baroque, and that therefore the associated negative sentiment really belongs with the Class C projective content, along with the content of X in expressions like *stop X* and *know X*. This might in some ways be a natural fit in the sense that the projective content associated with *cause* is also a condition on its clausal complement (Steve Wechsler, p.c.). However there, too, it is an uneasy match since the Class C projections all involve canonically truth-conditional content, unlike sentiment or the projections associated with expressives, for example. In any case, problems similar to those discussed for Class B content below obtain for Class C content: Q: *Has John ever smoked*? A: *He stopped smoking last year*. (implication: *Yes, he has smoked.*).

The negative sentiment associated with *cause* differs in some ways from the other examples of Class B projective content, however. Unlike expressives, slurs, some appositives, and other bearers of sentiment such as (non-projecting) lexical encoders of sentiment, for example, the negative sentiment does not seem to be a part of the (intentionally) expressed content of *cause*. In particular, the evaluative implicatures that are generated cannot be used as the answer to a question:

(191) a.　　Q: How do you feel about Bill?
　　　　　　A: That bastard works in my office.　　(implication: *I don't like Bill*)

　　　b.　　Q: Do you like the cereal?
　　　　　　A: It's soggy.　　　　　　　　　(implication: *No, I don't like the cereal)*

　　　c.　　Q: What do you think of the results?
　　　　　　A:#John caused them/#they were caused.

However, infelicity in answers is not uncommon for projection triggers (see Simons et al. 2010):

(192) a.　　Q: Are there any boys in your class?
　　　　　　A:#I (don't) like the boys in my class.

　　　b.　　Q: What's the weather like?
　　　　　　A:#Bob realizes / doesn't realize that it's raining.

In (192a), an inference of existence is triggered by the definite determiner and in (192b) an inference is triggered by the factive *realize* that its complement holds, but neither triggers are felicitious as answers to questions asking about that information. Indeed, some other class B inferences are similarly bad as answers:

(193) Q:　　Is John a doctor?
　　　A:　　a.　　#John the doctor is always professional.
　　　　　　b.　　#John, who is a doctor, is always professional.

Non-restrictive relative clauses (NRRCs) and non-expressive appositives, then, cannot be used as answers to the question of whether they hold. However, the felicity of (191a) suggest that answerhood does not necessarily require that content be at-issue and declarative, but in some way (intentionally) expressed, or perhaps that its expression itself be made somehow at-issue, and the infelicity of *cause* predicates as answers suggests that negative sentiment is not part of the expressed meaning of *cause*, but is rather an evaluative harmony condition or some other limiting condition of use, as suggested above.

The answerhood criterion seems to distinguish the negative sentiment of *cause* from the content of expressives.[99] *Cause* does seem to meet some of the other criteria of conventional implicatues, however.[100] As seen by the Family of Sentences diagnostic above, it is scopally inert (to use a different term for "projection"). It is also assertorically inert (Horn 2002, Potts 2007):

(194) A: John caused it to happen.

       B: No, I disagree. (Bill caused it / #It was a good thing).

Unlike conventional implicatures such as appositives, however, it is not clear that the negative sentiment associated with *cause* gives rise to redundancy effects:

(195) a.   Lance Armstrong, the cyclist, battled cancer. #He is (also) a cyclist.
                                                                (Potts 2007, 7)
       b.   John caused it to happen. It was a bad thing.

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[99] It should be noted, however, that, like expressives, the negative sentiment associated with *cause* is primarily speaker-oriented. I take speaker-orientation to be a feature of all expressive meaning, despite the possibility for perspective-shifting (see, e.g. Harris & Potts 2009). In fact, I suspect that the famous analysis of *oops* suggesting it is non-speaker-oriented (Kaplan 1997) is an error based on an empathetic reading resulting from one such possible perspective shift for expressives.

[100] In fact, the felicity of expressives as answers to questions might be a challenge to their status as conventional implicatures: "attempts to answer questions using presuppositions or conventional implicature are typically infelicitous" (Simons et al. 2010, 319).

Explicit repetition of the content in the NRRC in (195a) is infelicitous, which is not the case for negative sentiment *cause*. There are some exceptions to this tendency among other putative conventional implicatures, though, so this behavior does not in itself distinguish *cause*:

(196)   Bill is always fucking late. I don't like {him/it} / I feel very strongly about it.

Like the negative sentiment inference of *cause*, explicit repetition of expressive content is not perceived as redundant.

Both answerhood and redundancy seem to arise due to the placement of some information into the common ground[101] in one way or another, but negative sentiment *cause* allows neither, unlike other class B inferences, which allow one or both. It is consequently a somewhat awkward fit among the other varieties of projective content discussed in the literature. The lack of clear diagnostics independent of those suggested here that can distinguish meaning that is intentionally expressed or asserted from the more covert, unintentional variety associated with *cause* leaves its status somewhat indeterminate. In particular, there may be other diagnostics beyond answerhood and redundancy for intentionally expressed meaning that *cause* meets. Nevertheless, it seems based on the judgments above that negative sentiment inference triggered by *cause* is a class B inference, but is a somewhat uneasy class B inference due to an apparent lack of update, either declarative or expressive, of the common ground or discourse context, and that despite the similarity of its content to expressives, the negative

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[101] "The common ground of a conversation at a particular time is the set of propositions that the participants in that conversation at that time mutually assume to be taken for granted and not subject to (further) discussion" (von Fintel, 2000, and see *inter alia*).

sentiment associated with the use of *cause* is not intentionally expressed meaning. In other words, the felicitous use of the periphrastic causative verb *cause* does not "give" information about negative sentiment, but rather "gives off" that information (see e.g Goffman 1959 for an elaboration of this distinction).

A summary of the properties of *cause* as compared to some other projective content triggers and entailments are given in the table below,[102] where SCF is "Strong Contextual Felicity" and OLE is "Obligatory Local Effect". The indeterminate status of *know/stop*-type predicates as answers is due to the intuition that some are acceptable in that role and others not:

(197) a.   Q: Has John ever smoked?
               A: He (just) stopped smoking last month.

     b.   Q: Is John a doctor?
               A: #Mary knows that he's a doctor.

The outstanding redundancy judgments (as indicated by the second sentence tags, assuming accommodation of the first sentence), combined with Strong Contextual Felicity judgments (the first sentence tags, assuming no context), are as follows:

(198) a.   John **stopped** smoking last month / Mary **knows** that John
               used to smoke. #John used to smoke.
     b.   #**He**'s always barking. #I have a dog.
     c.   # Katherine is a sword-swallower **too**. #Nathan is a sword-swallower.

---

[102] Note that the status of *cause* with respect to Obligatory Local Effect is perhaps a controversial judgment, as described above, depending on whether the emphasis of this criterion is taken to be "local" or "obligatory", but the diagnostics above suggest that negative sentiment as triggered by *cause* need not be local, which is the motivation for the classification here.

	Projection	SCF	OLE	Question answer	Redundancy
cause sentiment	✔	✗	✗	✗	✗
Expressives	✔	✗	✗	✔	✗
NRRCs	✔	✗	✗	✗	✔
know/stop	✔	✗	✔	%	✔
pronoun existence	✔	✔	✔	✗	✔
too alternative	✔	✔	✗	✗	✔
entailment	✗	✗	✔	✔	✔

Table 12: *Cause* in an expanded taxonomy of projective content.

Note the non-overlapping feature row-values in Table 12. If felicitous question-answering and redundancy are taken to be additional parameters for projective content, it can be seen that negative sentiment *cause* doesn't quite fit anywhere.

3.   Register

Several of the periphrastic causative verbs examined here differ with respect to formality in context of use. This kind of variation is something that speakers of a language often have very clear intuitions about, even if they have difficulty characterizing it. An English speaker knows, for example, that a different type of speech is called for when making a professional presentation to a group of strangers than when making plans for dinner with a loved one. Similarly, a text message to a friend obeys different rules than an email or letter to an employer. The aggregate of these differences is what will be referred to here as "register".

In the sociolinguistic tradition, 'register' sometimes refers to a more general phenomenon that might be more intuitively described as 'style,' and, in fact, the two terms are often interchangeable in the literature (see Gregory 1967, 194 for a

discussion of the terminological confusion). The relevant scale for the present

purposes is that of formality, which interacts with both the field of discourse and the

mode of communication, among potentially other criteria, to make up the larger

phenomenon of linguistic style. This "formal" versus "informal" distinction is

sometimes called 'tenor' by sociolinguists. Formality is also a feature of so-called

"social deixis" (see Levinson 1983, 89), in which there is a prestige differential

between speakers, which influences the selection of T/V pronouns in Romance

languages (see Levinson 1983, 128ff), and it often arises from the presence of

diglossic variants, as was the case for a common encoding strategy for formality in

English, that of word origin (see discussion below, and footnote 107).

The question of what constitutes register intuitions, as well as that of what

kinds of linguistic cues track formality, is not yet clearly understood. It is typically

defined in terms of its effects regarding appropriateness and uniformity, e.g. "It is

generally inappropriate to mix registers, to use them in the wrong contexts, just as it

is inappropriate to wear tennis shoes with a ball gown or to wear a ball gown to

your linguistics class" (Chierchia & McConnell-Ginet 1990, 51). Despite its relative

ineffability, register distinctions seem to underlie different lexical realizations of

semantic minimal pairs throughout the English lexicon. In this section, register as a

component of meaning that can distinguish near-synonyms is motivated by the

behavior of the change-of-state verbs *get* and *become*. This method is extended to

the enabling periphrastic causatives *let* and *allow* and then used to characterize a

distinction between two senses of *cause*, thus accounting for the apparent

exceptions to negative sentiment encoding for *cause* and motivating the exchange of *thing* for *event* in the elicitation sentence frames described in section 1.2.

3.1 *Get* and *Become*

The verbs *get* and *become* seem, at first blush, to encode little beyond an inchoative change of state. Even on a strictly intuitive level, however, the verbs differentially favor arguments based not necessarily on the state being described, but the choice of word used to describe the state:

(199) a.   John got wasted
       b.   ??John became wasted
       c.   John became intoxicated
       d.   ?John got intoxicated

(200) a.   John got mad
       b.   John became angry/?mad

In (199) and (200), the degree of felicity appears to correspond to the degree to which the registers evoked by the verb and adjective correspond.[103]

Get appears to favor words that signal an informal register, while *become* is reserved for more formal speech. When these verbs occur with adjectives that evoke the opposite pole of the formality scale, various degrees of register clash result. Figure 47 illustrates this phenomenon by means of Google's n-gram viewer:

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[103] Another feature for which *get* and *become* differ is that of agent volition. *Get*, but not *become*, suggests that the change of state was an intentional – or at least cooperative – one for certain sentences containing animate subjects. This difference is illustrated by the sentence *John got married* when compared to the much less likely and pragmatically unusual *John became married*. How and whether volition and register interact, however, is unclear to me.
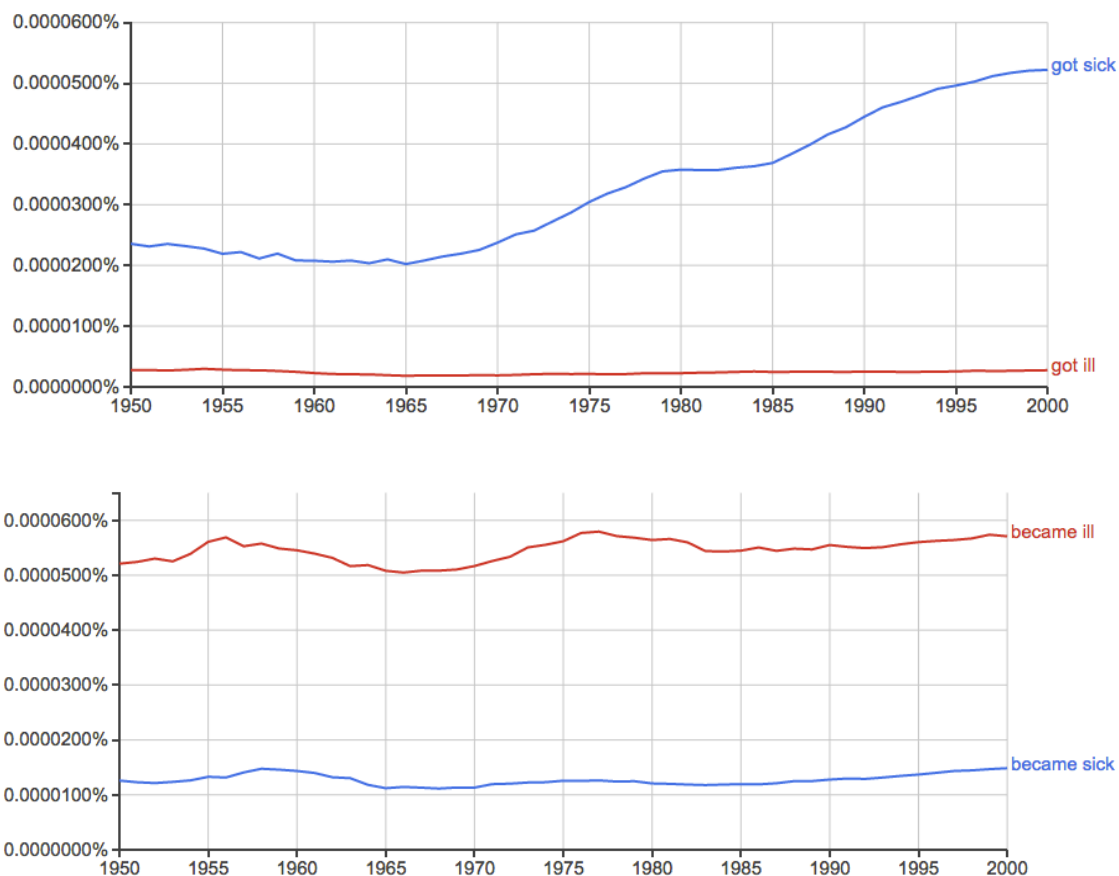
Fig. 47: register clash and meaning divergence – top: *got sick* vs. *got ill*; bottom: *became ill* vs. *became sick*.

The top graph illustrates that *get* preferentially selects for the informal register *sick* while the bottom shows that *become* preferentially selects the formal *ill*. Although the judgments about register for *sick* and *ill* are themselves based on intuition and are therefore as of yet only suggestive,[104] if these adjectives do differ in terms of formality, the graphs in figure 47 suggest a divergence over time in acceptability for these verbs and register clashing adjectives, with *get sick* becoming more frequent even as *become sick* is stable. One possible explanation for these data is in terms of

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[104] Although the judgement that *sick* is informal and *ill* is formal is asserted by a lexicographer here: http://learnersdictionary.com/qa/sick-and-ill.

evolving lexical pragmatics (see, e.g., Wilson & Carston 2007), with a historical lexical narrowing as linguistic register becomes an increasingly grammatically relevant aspect of meaning for the two verbs and they semantically drift apart along that dimension:
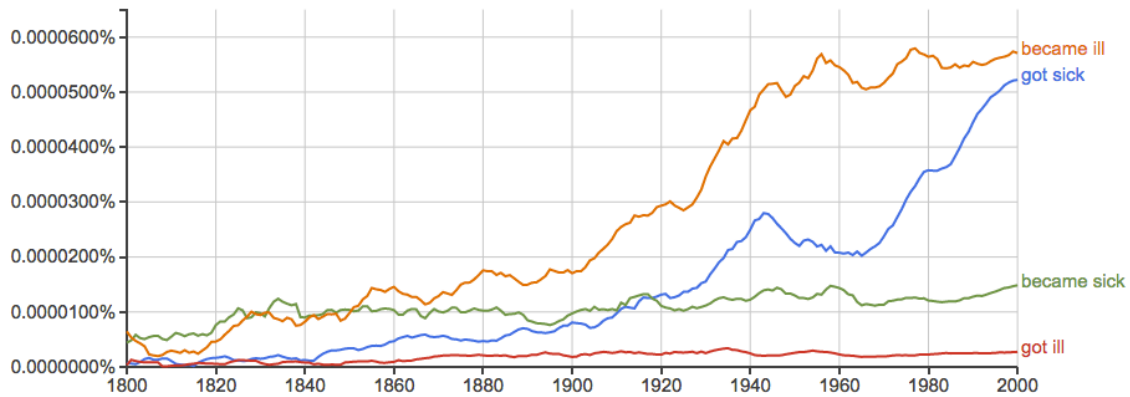
Figure 48: Ngram frequencies for *become/get sick/ill*.

The graph above shows the data for *get/become sick/ill* over a longer timescale, demonstrating increasing divergence over the last two centuries.

Frequency data for a larger group of arguments drawn from the Corpus of Contemporary American English are consistent with a general register distinction, beyond these verbs' behavior with *sick* and *ill*. For example, while *become* is common with Latinate words like *clear*, *apparent*, and *available, get* occurs more often with Germanic words like *better, ready*, and *worse*. This Latinate-Germanic distinction has indeed been elsewhere proposed as a marker of register differentiation (see, e.g. Bar-Ilan & Berman 2007, *inter alia*), a result of the diglossia between the Old English speaking lower class and French speaking ruling class subsequent to the Norman Invasion. The selectional preferences are mostly consistent with respect to this distinction (see description of method in section 1):
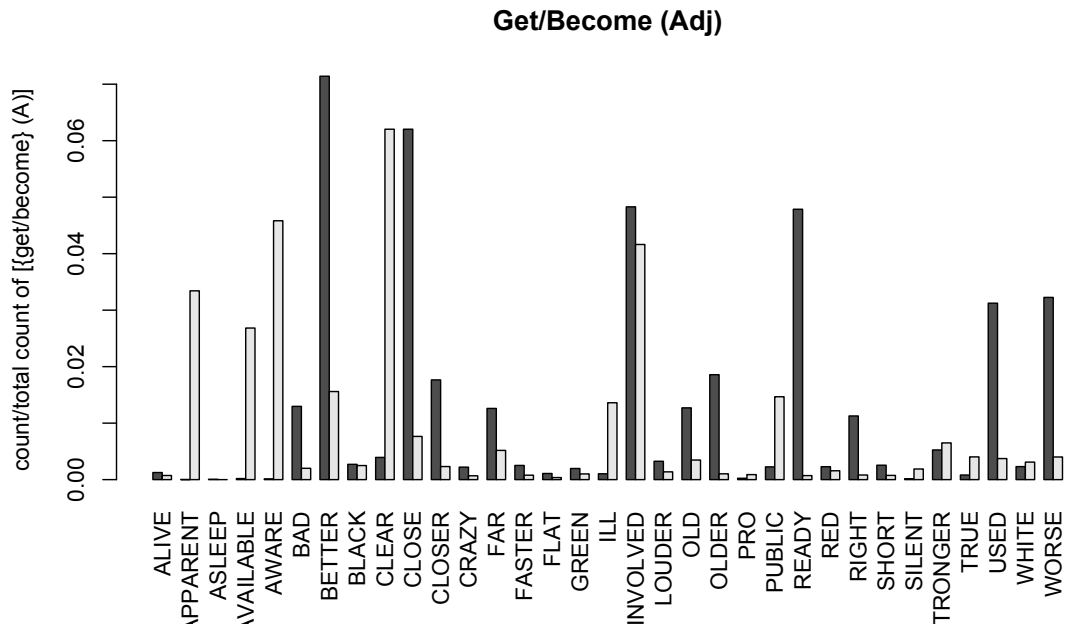
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Get/Become (Adj)

Fig. 49: Collocation frequencies for *become* (black) and *get* (white).

When separated by adjective word origin, difference between the preferential selection behavior or the two verb emerges:
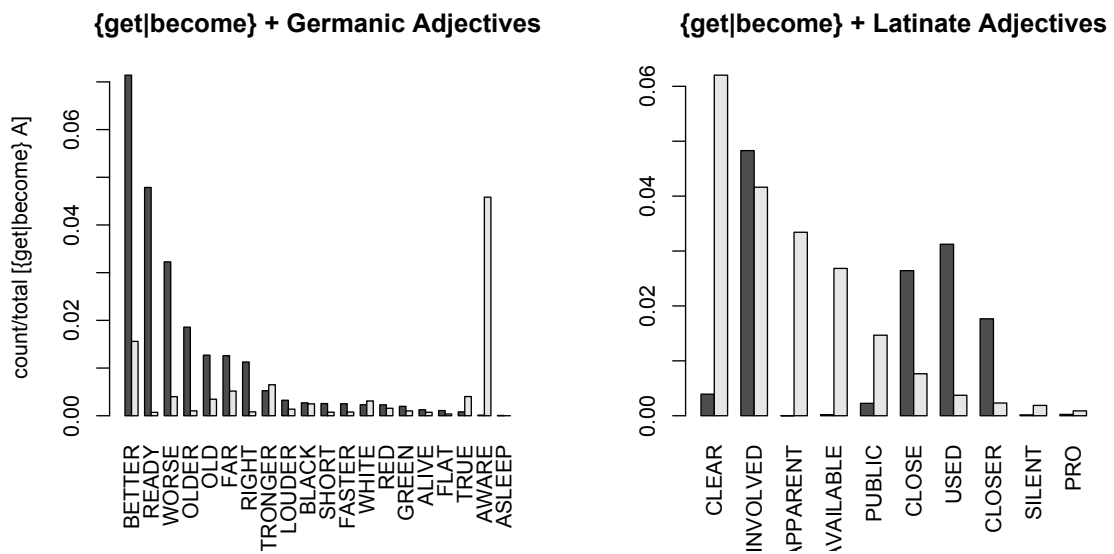

{get|become} + Germanic Adjectives

{get|become} + Latinate Adjectives

Figure 50: Collocation frequencies for *become* (black) and *get* (white), by collocate word origin.

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Except for *aware* and *better*, all of the most common complements of *become* are of Latin origin, while except for *close, used,* and *involved*, all common collocates of *get* are Germanic. *Become* and *get* both have Germanic origins, so it is unlikely that their difference is due to some register-independent preference of German words for other German words and Latinate words for Latinate words (see the following section for a fuller discussion of this claim).

3.2   *Let* and *Allow*

Let and *allow* are neither as clearly semantically basic as *get* and *become*, nor are their collocation results as straightforward. It is clear that *let* and *allow* are not light causative verbs in the same sense of *cause* and *make*, for example, in light of their special status as enabling causatives. One important difference previously mentioned is that, for *let* and *allow* the "caused" subevent is cancelable. As detailed in chapter 3, *let* and *allow* also encode a kind of facilitation, or removal of obstacle that potentially places the subject of these verbs at a greater remove in the causal chain, as discussed for the water-draining example in chapter 3. These verbs, like *get* and *become*, seem to bias their arguments in terms of register.

Again, this claim relies on intuitions about the register difference between possible arguments, which is without independent support. However, the Latinate – Germanic distinction is maintained for *enter* and *come in*,[105] so if that distinction is

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[105] According to the Oxford English Dictionary, *enter* is from the French 'entrer,' while *come* was Old English 'cuman' from a common German strong verb.

indeed a tracker of formality and *enter* is associated with a more formal register than *come in*, Google's N-gram viewer shows some suggestive trends:
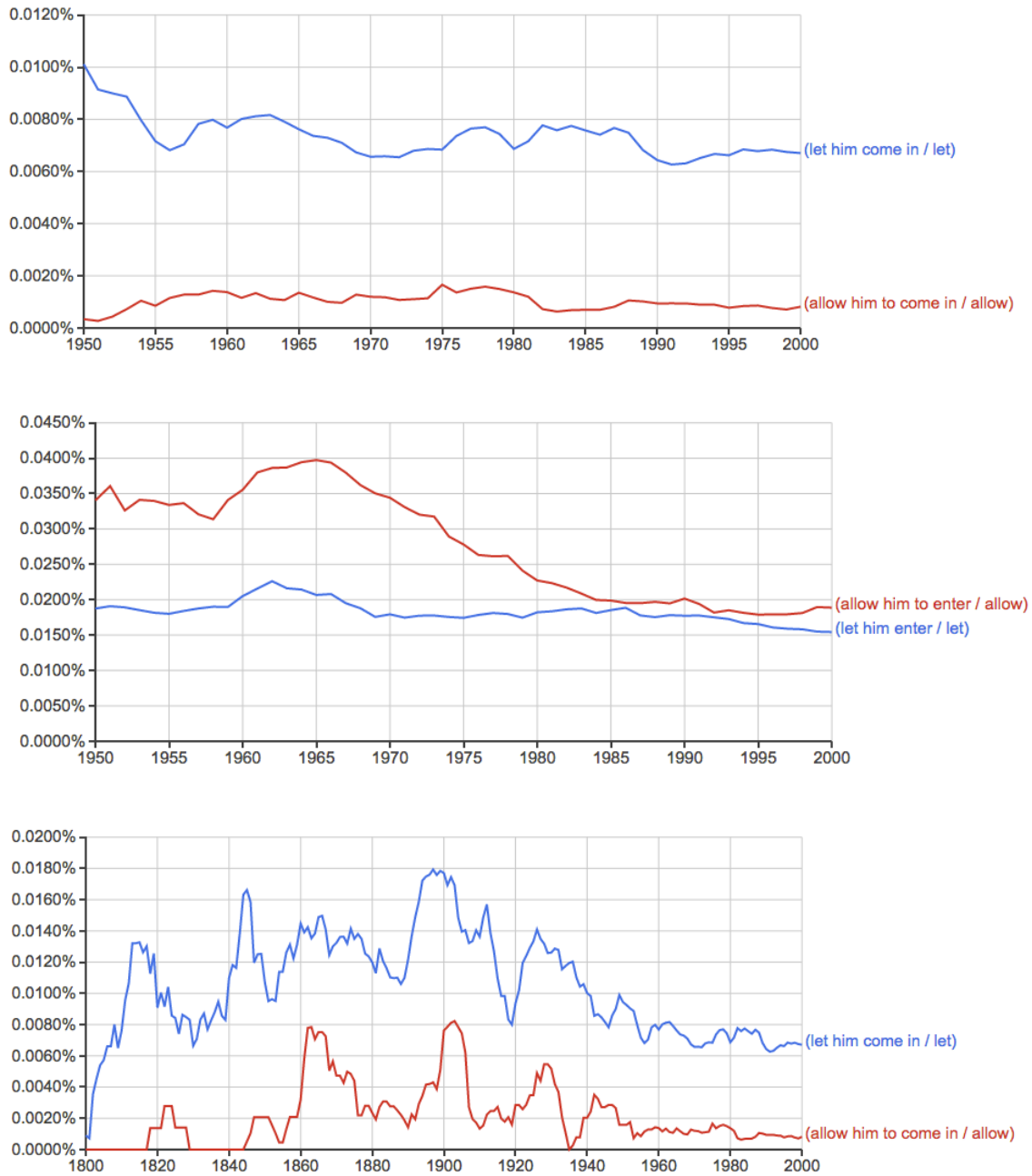

Fig. 51: *let/allow come in/enter* collocation, normalized by *let* and *allow*, respectively.

The top graph shows that *let him come in* is more frequent than *allow him to come in* independent of the relative frequencies of *let* and *allow*, the middle graph shows that the verbs with *enter* have very similar normalized frequencies, and the bottom graph illustrates that the difference with "come in" for the two verbs is relatively stable over the last two centuries.

One possible alternative explanation for these data is that Germanic words tend to co-occur with Germanic words in English, and Latinate words with Latinate words, independent of any supervening parameter like register. Although this does not explain the data in the previous section, since *get* and *become* are both Germanic as mentioned there, it is true that *let* is a Germanic word and *allow* is Latinate. This suggestion is suspect since a similar phenomenon doesn't exist for words with different origins. For example, it's not the case that an Arabic word like *alcohol* typically occurs with other Arabic words like *algebra*. Most speakers are totally unaware of word origins, and there would seem to be no reason for words with the same provenance to co-occur absent some independent cognitively significant correlation. Indeed, there are formal Germanic words in English that, since formal, tend to co-occur with Latinate words (*become*, described in the previous section, is one such example), and vice versa. For example, the formal *father*, which is in competition with the informal *dad*, is of Germanic origin. However, in the COCA, when high frequency adjectives like *good*, *late*, *real*, and *great* are removed, the most common preceding adjectives of *father* are *founding, biological, holy, heavenly*, and *putative.* Except for *holy* and *heavenly*, these are all Latinate. Furthermore the phrases *holy father* and *heavenly father* are idiomatic, frozen, and – to my intuitions

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– formal expressions. Other formal Germanic words include *woe, chide, delve,* and *swift.* Conversely, there are informal words with Latinate origins, which seem to most frequently co-occur with Germanic words. It is difficult to find an obviously informal Latinate noun, but the adjective *adorable* is a clear example. The most common nouns following *adorable* in the COCA are *child(ren), baby, kids*, *face*, and *creature.* Of these, all except for *face* and *creature* are Germanic, and neither of these strike me as formal, the latter giving rise to the clearly informal *critter*, after all. And it is difficult to imagine an informal alternative to *face*[106] – it seems to have supplanted its Germanic equivalent. Interestingly, *children* does seem to be a more formal variant of the informal *kids*, which is also highly common with *adorable*, but they are both of Germanic origin and there are informal variants of *children* in some English dialects. Other clearly informal Latinate adjectives include *goofy, dicey, excellent,* and *rad.* Based on these considerations, it seems to truly be the case that formal register discourse environments favor formal lexical items, and informal environments informal, which in English correlates with word origin.[107]

One possible explanation for the trends illustrated in Figure 51 is that, while *let* is not incompatible with formal register, *allow* is infelicitous in an informal context. This may be a stable state in itself or it may perhaps represent some

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[106] Bloomfield (1933/1984) identifies in English the "*foreign-learned* forms – a class of forms with a separate style of pattern and derivation" (Bloomfield 1984, 153) and notes that these are typically Latin-French derived. He notes, for example, that *chair* is Latin-French in origin, however, but does not belong to the foreign-learned class. It seems clear that this class is roughly the formal register class discussed here, which correlates with word origin but admits exceptions.

[107] This phenomenon is, in fact, well understood. Following the Norman Conquest, there was a unique period of diglossia in England, with a French-speaking ruling class and a (Germanic) Old English speaking underclass. In the transition from Old to Middle English, in which a flood of French (Latinate) words entered the English language, this prestige difference manifested as a register difference in Middle English and beyond. See Bar-Ilan & Berman (2007), *inter alia*, for a summary.

preliminary stage of a divergent semantic drift. In either case *allow* emerges as a lexically narrowed expression of the general *let*-type enabling causative with the added semantic feature of formal register. This difference, in conjunction with that between *get* and *become*, suggests that formality is at least in some cases lexically differentiated in the English verbal lexicon even for otherwise very basic event-structural verbs, and that it consequently represents a further element of word meaning not represented in current decompositional analyses of lexical semantics.

3.3   Cause$_1$ and Cause$_2$

The parameter of register, and the evidence that it is sometimes lexically encoded, provides further insight into the behavior of *cause* as reflected in the corpora and experiments described in this chapter. In particular, I claim that there are two senses of *cause*: one formal register and sentiment-neutral, and the other unmarked for register with negative sentiment. Traditional zeugma tests for polysemy are difficult to apply in this case due to the general difficulty of a sentence-local register shift, so the argument is somewhat indirect. Nevertheless, there is clear evidence that the two parameters of sentiment and register correlate for *cause* in a way suggestive of a sense distinction.

Before examining the data for *cause*, however, it should be noted that sentiment and register do not correlate in general. This can be demonstrated by comparing the sentiment ratings for all Germanic and Latinate adjectives collected

for the experiments described above.[108] The average SentiWordNet rating for Germanic adjectives was -0.025723404 and for Latinate adjectives it was only very slightly lower at -0.045657407. A quartile boxplot demonstrates a remarkable similar distribution:
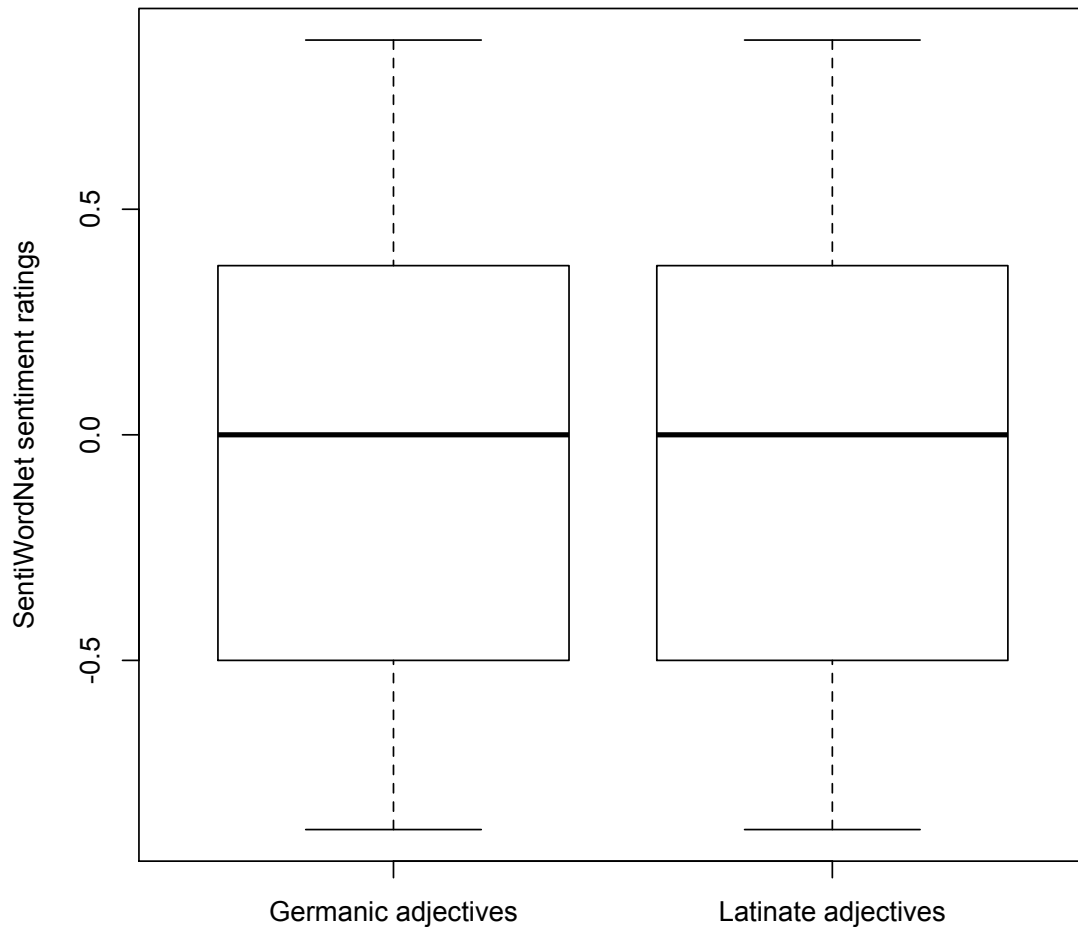

Figure 52: Boxplot for SentiWordNet ratings of Germanic and Latinate adjectives.

This chart shows no significant difference between the sentiment of the Germanic adjectives and the Latinate adjectives in these data. In fact, the Latinate adjectives

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[108] All word origin data comes from the Oxford English Dictionary. See Appendix for all word origins.

skew slightly more negative than the Germanic, which is the opposite of what would be expected if the sentiment results here were epiphenomenal of register or word origin. A one-way analysis of variance gives a p-value of 0.8195, indicating a 82% probability that Germanic and Latinate adjectives come from the same sentiment population. The average elicited sentiment rating for Germanic adjectives was 4.095203877, and for Latinate adjectives it was 4.124991069. These, too, were distributed very similarly:
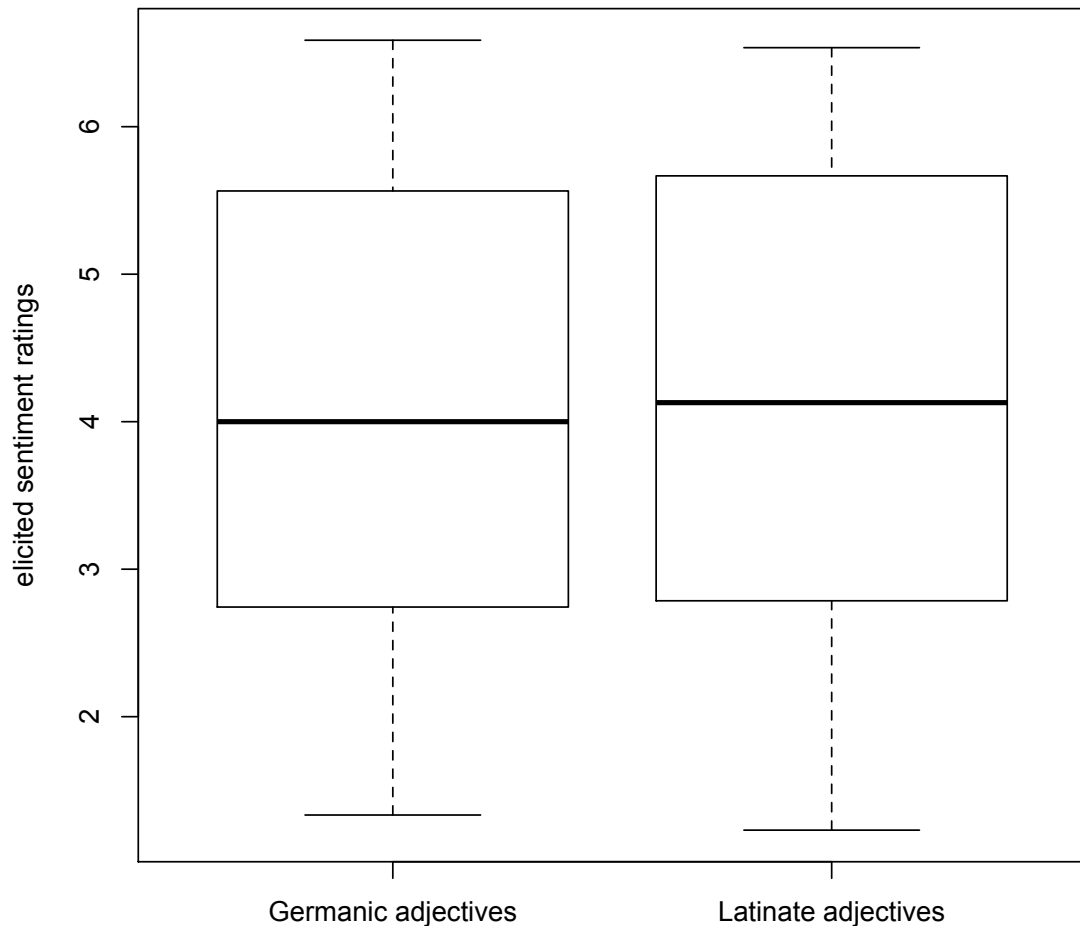

Figure 53: Boxplot for elicited sentiment ratings of Germanic and Latinate adjectives.

The analysis of variance for these data gives a p-value of 0.943, indicating a 94% probability that Germanic and Latinate adjectives come from the same sentiment population. It is clear that word origin and sentiment do not correlate in these data.

The two experimental blocks of *causes*, which are repeated below, however, do differ significantly in terms of the word origins of the adjectives elicited.

Block 1:   John caused the very _____ event to happen.
                John made the very _____ event happen.

Block 2:   John caused a very _____ thing to happen.
                John made a very _____ thing happen.

The first block elicited 18 Germanic adjectives and 42 Latinate adjectives for the *cause* sentence frame, while the second block elicited 129 Germanic and 118 Latinate adjectives. A Fisher's Exact Test for count data indicates a p-value of 0.001445, indicating a very significant difference between the two blocks in terms of origins. The mean SentiWordNet score for the Germanic adjectives in block 1 is -0.2222222, the mean for block one Latinate adjectives is -0.05059524, the block 2 Germanic mean is -0.2170543, and the block 2 Latinate mean is -0.1493644. No pairwise comparison of means for these groups reaches significance, with only the Latin block 1 and German block 2 differences coming close at $p = 0.08292$.[109] Note, however, that the sentiment variance for *cause* between the two blocks seems to be associated with the sentiment variance of the Latinate adjectives between the blocks in addition to the greater proportion of negative Germanic adjectives in the second

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[109] Note that these values are more negative than the means given above, preceding figure 52. Those numbers included the less negative adjectives elicited in the *make* frame, while these data only concern the *cause* frame.

block. A mosaic plot illustrates the diferent proportions of Germanic and Latinate adjectives:
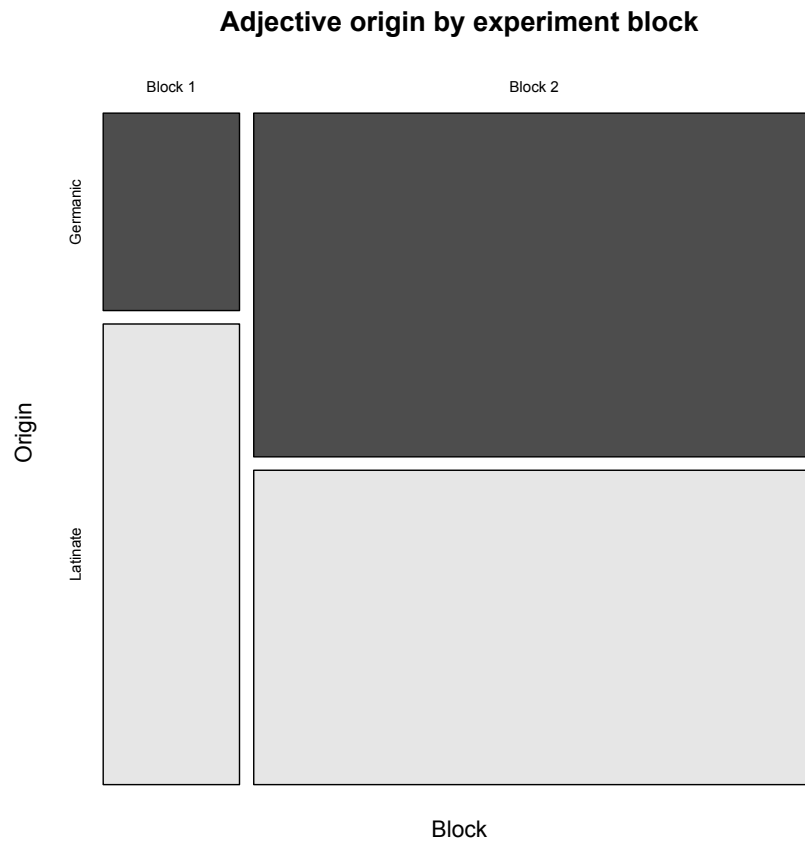

Figure 54: Mosaic plot for word origins of adjectives elicited for the two experimental blocks of *cause*.

Here, the block areas are proportional to the counts. The first block column is narrower than the second due to the larger sample size in the second block. The relevant difference here, though, is the relative width of the rows, representing the word origin distribution of the elicited adjectives. This plot shows the obvious bias for Latinate adjectives of *cause* in the first experimental block, for which sentiment

was found not to be significantly negative. In terms of percentages, the visualization is the same as the mosaic plot, modulo the potentially distracting width of the bars:
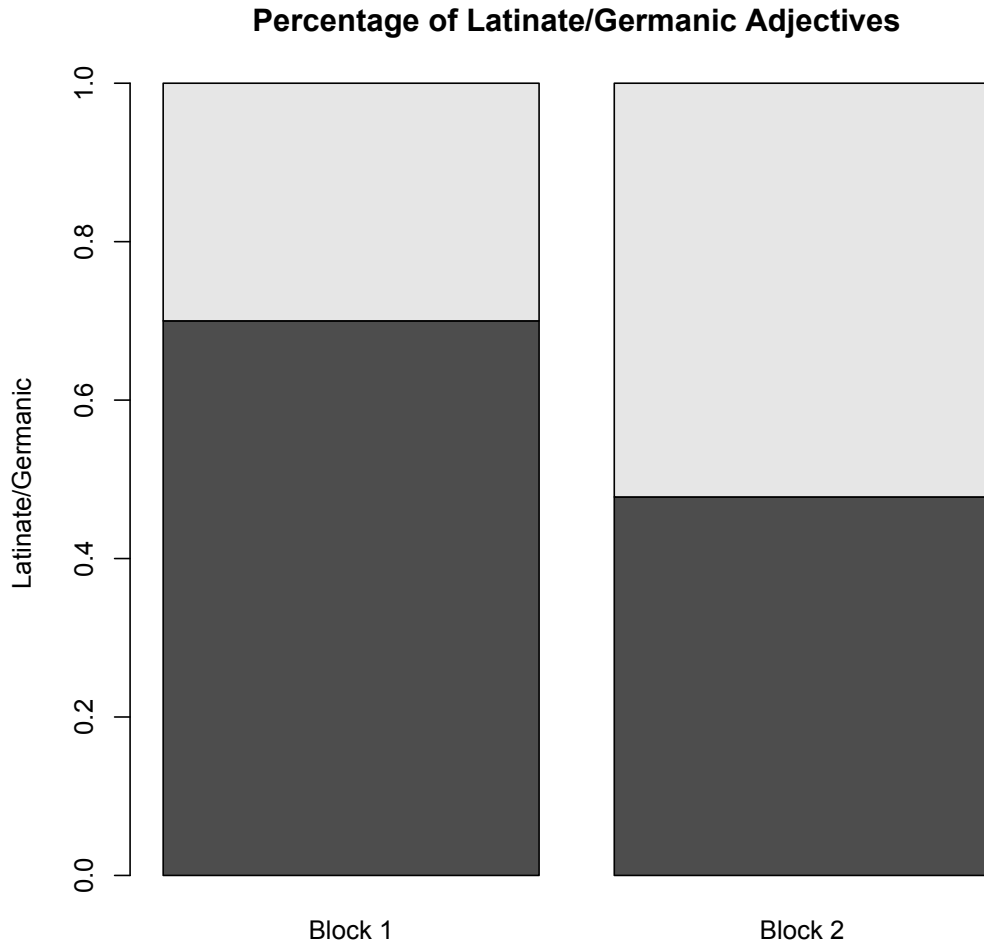

Figure 55: Percentages for word origins of adjectives elicited for the two experimental blocks of *cause*.

As these graphs make clear, the elicited adjectives in the first experimental block tend to be Latinate, while those elited in the second block are roughly equally distributed between Germanic and Latinate origin.

Note that there is a more common sense of *event* than the one that is being assumed here. Although here it is being assumed that *event* is being used in the academic/scientific (and thus formal register) sense, as an occurrence of some kind, a colloquial sense of *event* might be paraphrased as "gathering", "show", or "party" (John Beavers, p.c.), which is not associated with formal register. However, this type of "event" is independengly infelicitous in the elicitation frames, regardless of sentiment:

(201) ??Bill caused/made a really shitty wedding (to) happen.

<div align="right">(John Beavers, p.c.)</div>

Because of this, the existence of a more common sense of *event* does not present a logical problem for the analysis presented here. As long as the formal, scientific sense is favored, due to the independent infelicity of the non-formal sense, for both *cause* and *make*, and the presence of the formal sense seems to block the negative sentiment of *cause*, the argument about register bias goes through. Note also that the existence of a formal academic/scientific sense of *cause* was independently identified in the corpus sentences, so the putatively register-marked variant of *cause* without sentiment is not just unmarked for register, with an interpretation coerced by the presence of *event*. Rather, the infelicity of the more colloqual *event* in the elicitation frame is biasing in favor of the selection of the academic/scientific variant, which is in turn biasing in favor of the selection of the academic/scientific variant of *cause*, which, since unmarked for sentiment, is resulting in no significant negative sentiment in the first experimental block and, since the academic/scientific register is a formal one, this is in turn biasing in favor of the selection of Latinate adjectives, as demonstrated, which track formality in English.

The experimentally elicited sentiment scores for the two *cause* sentence

frames,[110] *John caused the very* _____ *event to happen* and *John caused a very*

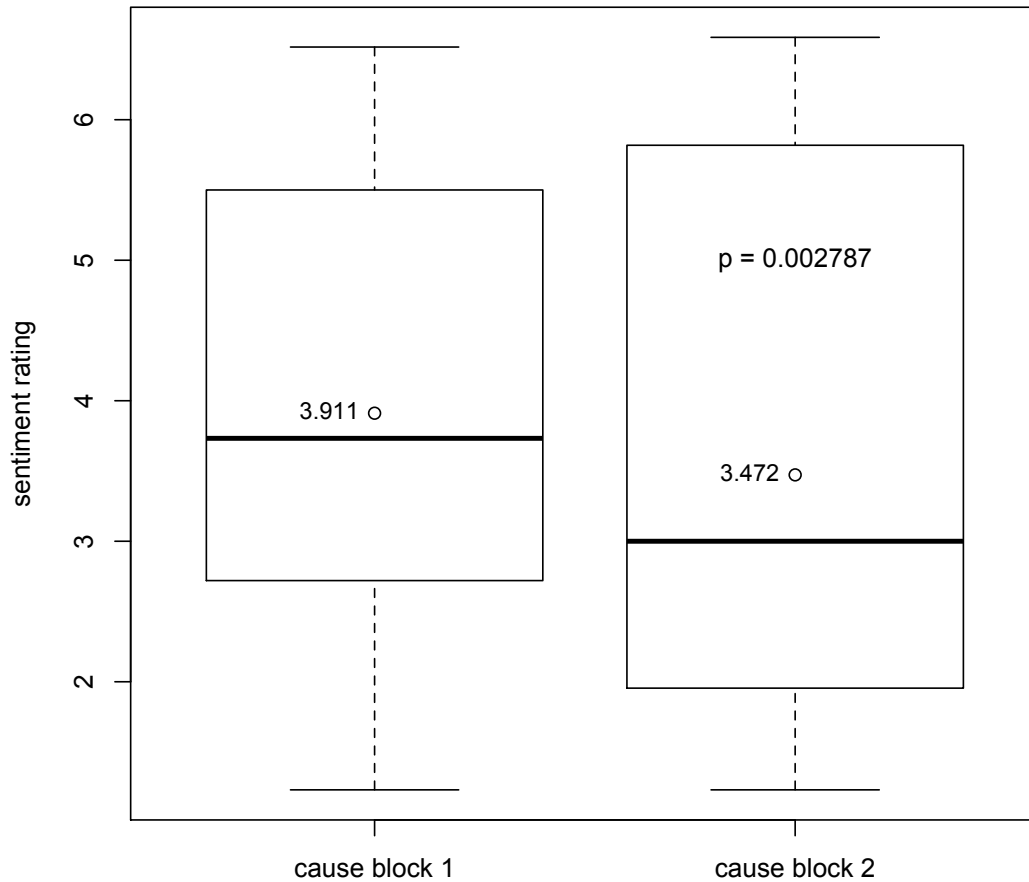_____ *thing to happen*, are also significantly different:[111]

Figure 56: sentiment ratings for adjectives in the first and second block of *cause*.

This paired boxplot with means show that the mean sentiment score for the second

block of elicited adjectives for *cause* is significantly more negative than that of the

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[110] The SentiWordNet ratings, although also on average more negative for the second block, failed to reach significance when directly compared to *cause* adjectives in the first block.

[111] There is one potential confound in the logical space, which is that definite vs. indefinite articles correlate with formal vs. informal register. I don't know of any research that has addressed that question, and it can't be ruled out as a possibility. The question is left to future research.

first block (p < 0.05). These data indicate that, while word origin and sentiment are not correllated in general, the block with the significantly higher proportion of Latinate adjectives, which corresponds to formal register as noted above, has neutral sentiment, while the register-neutral *cause* with proportionally more Germanic adjectives is associated with negative sentiment. This interpretation of the data predicts that *cause* would be better with formal (Latinate) positive collocates, since the formal variant is unmarked for sentiment, than informal (Germanic) positive collocates, since the variant compatible with informal register (since unmarked) is marked for negative sentiment. Indeed, *cause* is better with the formal *positive* than with *good*, which is felicitous in informal contexts:
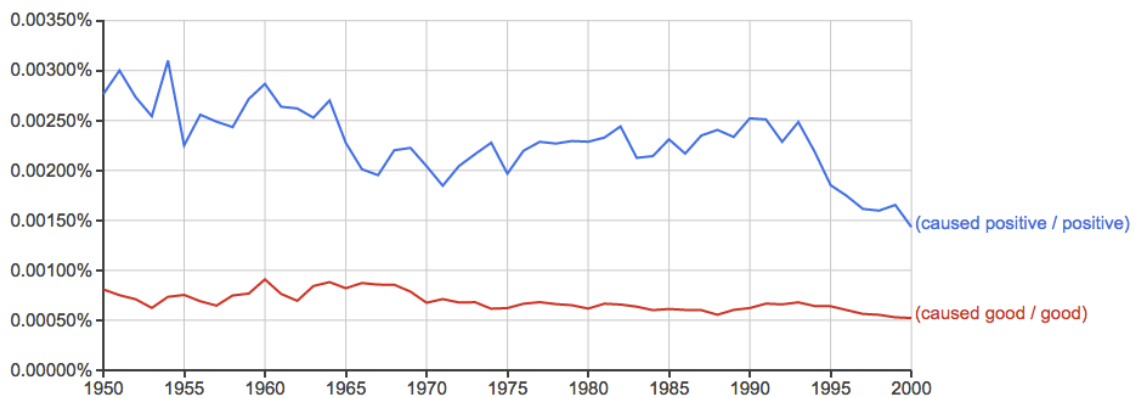

Figure 57: N-gram frequencies for *caused positive* vs. *caused good*, normalized by *positive* and *good*, respectively.

These data suggest that, independent of word frequency, *cause* favors formal positive-sentiment adjectives to non-formal positive-sentiment adjectives, since informality and positive sentiment together are incompatible with either sense of *cause.*

4.   Summary

In this chapter, I have argued that the English periphrastic causative verb *cause* has at least two senses. One sense is a sentiment-neutral formal register lexeme, and it occurs most felicitously in scientific or academic discourse, while the other more common sense is unmarked for register, but encodes negative speaker sentiment. These results are summarized in the table below:

	Register	**Sentiment**
cause$_1$	(unmarked)	negative
cause$_2$	formal (scientific/academic)	(unmarked)

Table 13: Two senses of English *cause*.

Regarding the negative sentiment inference triggered by the primary sense of *cause*, I have demonstrated that this inference is projective content that is not defeated in entailment-cancelling environments such as negation and other members of the Family of Sentences diagnostic. Using the framework of Tonhauser et al. (2013), I have argued that negative sentiment associated with *cause* is a class B projective inference, which are those inferences without either Strong Contextual Felicity constraints or Obligatory Local Effect.

Inference	Trigger	Projection	SCF	OLE	Answer	Redundancy
Negative speaker sentiment	Periphrastic *cause*	✔	✘	✘	✘	✘

Table 14: Summary of negative sentiment *cause* properties.

As the table above illustrates, I have further argued that the infelicity of a *cause* sentence as answer to a question and its lack of redundancy effects complicate a comfortable fit among the other salient type B inferences, which has led to the suggestion that negative speaker sentiment is not intentionally expressed by a speaker using periphrastic *cause*, but is rather a different species of use-condition.

Chapter 5:   Conclusion

This thesis represents the fruits of an attempt to identify and isolate the evaluative and affective components of meaning of a theoretically interesting class of verbs in English. The approach involved corpus analysis as well as experimental elicitation and judgment tasks. In this study, I have tried to provide a unified account of the meaning variation among the periphrastic verbs for directive causation in English, and to propose an explanation for the selection restrictions of the verb *cause* based on speaker sentiment.

In chapter 3, differences in the behavior of the periphrastic causatives in situations of directive causation were examined in light of existing approaches. The force-theoretic approach due to Talmy (1988, 2000) is, at its root, only metaphorically applicable to directive causation, while Wierzbicka's (1988) Natural Semantic Metalanguage analysis is lexically idiosyncratic, missing generalizations about the verbs' uses. Instead a parameter of meaning called here "inclination" is proposed, which is a measure of an individual's preference with respect to performing, or not performing, some action. This was argued to account for the verbs' selectional and inferential behavior in a systematic way.

In chapter 4, characterizations of the periphrastic causative verb *cause* as a general expression of causation were challenged in light of the apparently

expressive (or other similar) sensitivity of the verb to speaker sentiment. In corpus sentences, *cause* was found to almost exclusively occur in unambiguously negative contexts, with the exception of a smaller set of usages that all appeared to occur in academic or scientific contexts. By means of collocation elicitation and controlled native speaker judgment tasks, colloquial *cause* was found to select for negative sentiment adjectives to a statistically highly significant degree. By comparing the origins of adjectives of *cause* in informal contexts to those in contexts with formal register words, *cause* is argued to be polysemous, with a negative sentiment primary sense and a formal register secondary sense.

To summarize, the primary sense of *cause* is argued here to be sensitive to the evaluative stance of the speaker toward the caused subevent. The periphrastics *force* and *let* are argued to be sensitive to the causee's evaluative stance toward the caused subevent. *Get* encodes that the causee's evaluative stance toward the caused subevent has changed over the course of the causing event, and *have* signals that the evaluative stance of the causee toward the caused subevent is irrelevant due to an authority differential. Directive *make* is claimed to be a general effectuating (not inclined) directive causative

The relative values for distinctions that are together sufficient to distinguish the main periphrastic causatives is given in the table below. Here, ✖ means negative sentiment, resistant, or negative value for a feature, ✔ means inclined or positive value for a feature, ✖➔✔ means a transition from resistant to inclined, ⊠ means unmarked for inclination, or non-evaluative:

| | Evaluative Stance | | obligatorily directive | enabling |
	speaker	causee		
cause	✖		✖	
let/allow		✔	✖	✔
force		✖	✖	✖
get		✖→✔	✖	✖
have		⊠	✔	✖
make[112]			✖	✖

Figure 58: Distinguishing features of select periphrastic causatives.

These differences can also be expressed in terms of a feature hierarchy. In the tree diagram below, features are inherited from dominating nodes, so if a lexical item occurs in a non-terminal node (*make* is the only example here), it is a hypernym of any lexeme or lexemes it dominates. S-$\varnothing$ and r-$\varnothing$ means that the node is unmarked for sentiment and register, respectively. A consequence of this is that sisters of $\varnothing$ nodes differ only from the lexemes that are dominated by $\varnothing$ by the feature indicated, as well as any features intermediary between $\varnothing$ and the terminal nodes: sisters to $\varnothing$ are general with respect to the set of words they c-command except for the feature they are marked for. Thus *cause$_1$* and *cause$_2$* are general indirect causative verbs, except for negative speaker sentiment and formal register, respectively.[113]

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[112] Note that *make* can express inclined causation when it takes a small-clause complement: *She makes me happy*. Although the focus of this thesis is the '{periphrastic} NP (to) V' frame, this possibility with small clauses is the reason for the lack of a mark in the "causee" column.

[113] The tree only makes explicit those distinctions developed in this thesis. In that way, sets of words in a terminal node represent essentially an unexpanded node, with further distinctions to be made. For a hypothesized architecture with expanded nodes for manipulative causation as well as the inclusion of *drive*, see the Appendix.
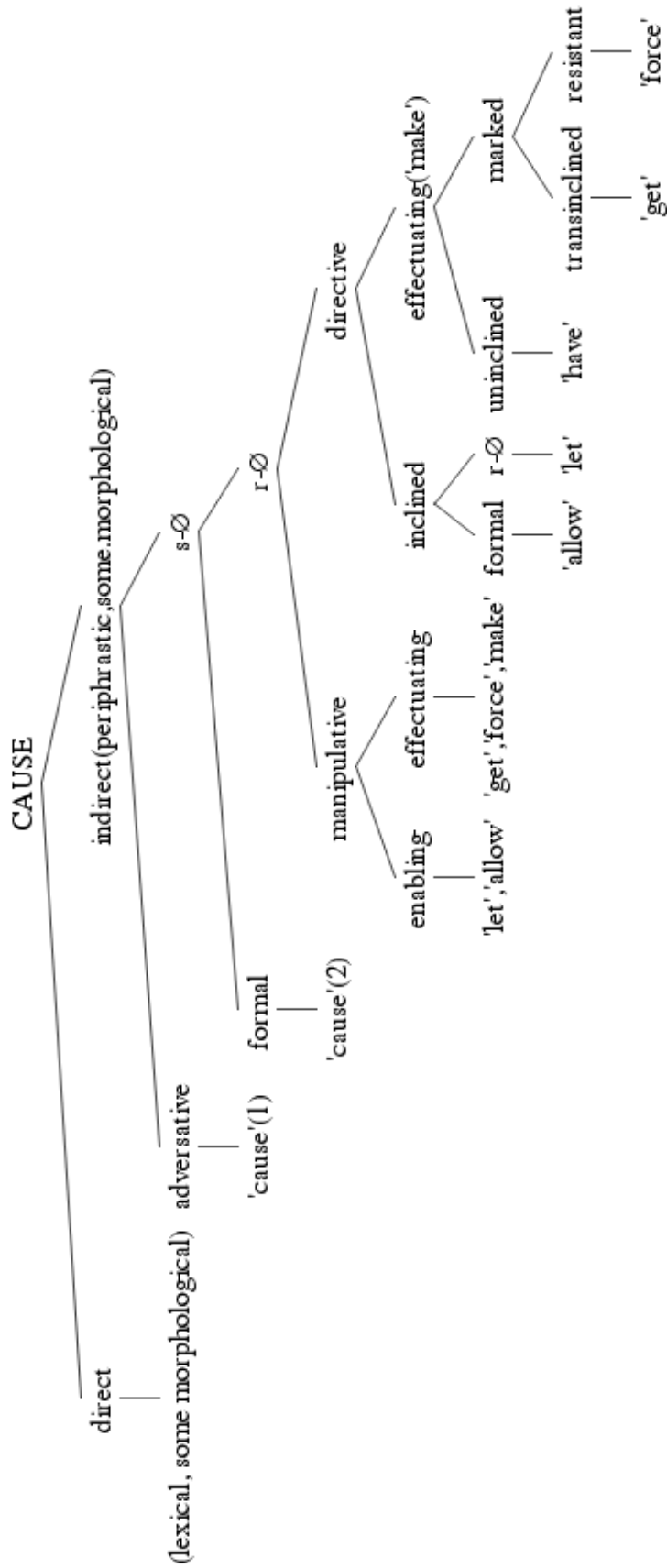
Figure 59: Feature hierarchy for English verbal causatives.

To take an example illustrating feature inheritance in this model, the verb *allow* is a formal, inclined, (directive), (indirect) causative verb. The parenthesized features are redundant here, which is the result of the fact that higher node values are often constrained by the values for lower nodes – there is no inclined manipulative causative, for example. This is similar to the way that grammatical inheritance hierarchies work – there are no auxiliary nouns or definite adverbs in English.

This feature geometry makes some predictions. As mentioned above, feature incompatibility is expressed by marked sister nodes. Otherwise there is no incompatibility between features. So, an adverse transinclined-patient causative event can be expressed with *cause*(1), since the event is adversative and the verb is not-incompatible with transinclination, or *get*, since the causee is transinclined and the verb is not-incompatible with adverse events, but not *allow*, since that verb is inclined, which is incompatible with effectuating verbs, a node that dominates the transinclined verb. This prediction seems to be correct: if a person X convinces a person Y to commit a crime, then the descriptions *X caused Y to commit a crime* and *X got Y to commit a crime* are both felicitous, but *X allowed Y to commit a crime* is not, at least as a description of the entire causing event.

Since, as mentioned above, lexemes are hyponyms of lexemes in ancestral nodes, this geometry also predicts that anything expressed using *have, get,* or

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force[114] can alternatively be expressed with *make*. That prediction, too, seems to be correct. These events can also be expressed, as suggested, by c-commanding nodes with features that don't clash with the event being described. So events expressed with *have, get,* or *force* that the speaker has a negative sentiment toward, can also be expressed with *cause*, which also seems to get the facts of English right.[115]

There are a number of outstanding questions surrounding the nature of the sentiment encoding of periphrastic *cause*. One possibility is that expressive-like meaning, and in particular sentiment, is a dimension of meaning that exists alongside truth-conditional semantics in the lexicon (Potts 2006) and is likely to be found in all kinds of words in English and other languages, including light verbs and functional categories. I happen to think that is probably the case. However, there is some suggestive evidence from other languages regarding the association of causative constructions, in particular, with negative sentiment. It is worth looking briefly at constructions in Japanese and Russian to get some idea of the phenomenon.

In Japanese, there is a particular usage of the causative morpheme *–(s)ase* that occurs on verbs expressing negative sentiment. These constructions are often call "adversity causatives" (e.g. Pylkkanen 2002, Harley 1996):

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[114] This is the prediction made for directive causation. No explicit predictions are made for the subclassfication of the manipulative usages of these words, although I suspect it is similar (see the Appendix).

[115] Another, potentially more controversial prediction that this structure makes is that, for example *letting someone die* in English entails *causing* them to die if the death is a negative thing (note that this use of *let* is clearly not a directive causative). This seems to be true in my dialect (and ethical code), but it a contested issue in philosophical ethics (see, e.g. Steinbock & Norcross 1994).

(202) *Taroo-ga   musuko-o sin-ase-ta.*
       Taro-NOM son-ACC   die-CAUSE-PAST
       (i)   'Taro caused his son to die'
       (ii)   'Taro's son died on him' (the adversity causative)

                                              (Pylkkanen 2002, 81)

Note that on the adversity reading, glossed here with an English malefactive, the
event is interpreted as negative, but it is not obviously causative despite the
presence of an otherwise causative morphology. However, Pylkkanen (2002) claims
that "the construction does, in fact, have a causative meaning and […] its causative
meaning is exactly of the kind predicted to exist by the bieventive analysis of
causatives" (Pylkkanen 2002, 81).   In other words, the adversity causative
construction looks a lot like an English periphrastic causative.

Part of the evidence that the adversity causative truly is causative comes
from its ability to occur with *ni-yotte*, which is a *by*-phrase naming a causative event.
This differentiates the adversity causative from the related adversity passive:

(203) a.   Adversity causative + by-phrase naming a causative event:
               Taroo-ga   sensoo-ni-yotte musuko-o sin-ase-ta
               Taroo-NOM war-BY   son-ACC   die-CAUSE-PAST
               'Taro's son was caused to die on him by the war'

       b.   Adversity passive + by-phrase naming a causative event:
              Taroo-ga   sensoo-ni-yotte musuko-ni sin-are-ta
               Taroo-NOM war-BY   son-DAT   die-PASS-PAST
               Intended: 'Taro's son died on him by the war'

Note that the English gloss of (203b) is also ungrammatical, suggesting that the
English malefactive applies to changes of states and not causatives (??*John's son was
killed on him (by the war)*). Note that, although the Japanese adversity causative
looks like an indirect (English periphrastic-style) causative event, it lacks an

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expressed causer. In fact, the expression of a causer, even in an oblique, in an adversity causative results in ungrammaticality:

(204) Adversity causative + by-phrase naming an agent:
   *_Taroo-ga_   _Hanako-ni-yotte musuko- o sin-ase-ta_
   Taroo-NOM Hanako-BY   son-ACC   die-CAUSE-PAST
   Intended: 'Taro's son was caused to die on him by Hanako.'

So, Japanese is an example of a language that employs causative constructions in the expression of negtive sentiment. There is also precedent in a language of co-occurrence of causative meaning and negative sentiment in a specialized construction that does not contain any morphological indicator of causation.

Russian is a language that, like English, has several periphrastic causative verbs:

(205) _Mysl'-∅_   _o smert-i_   _zastavljaj-et_   _zadumyva-t'-sja_.
   Thought-SG.NOM of death-SG.LOC make-PRS.3SG   think.of-INF-REFL
   'The thought of death makes us think.'

(Letuchiy 2012, pg. 35)

But these are not clearly associated with speaker sentiment. However, a construction often referred to as "adversity impersonals" do seem to express negative speaker sentiment and, as with English and Japanese, these constructions also convey causative meaning, although, as was the case for Japanese, that is not initially obvious.

Active Russian declarative sentences typically include a verb that agrees in person, gender, and number with a nominative subject:

(206) _Veter_   _otkry-l_   _dver'_.
   wind.NOM open-PAST.M door.ACC
   'The wind opened the door.'

However, there is a specialized construction for expressing adverse events without volitional agents (Babby 1994, Liskova 2011). These non-agreeing nominativeless constructions have the theme NP argument marked with accusative case:

(207) *Dorog-u razvezlo.*
      road-ACC carry-around[-AGR]
      'The road became muddy/unpassable (from rain).'

(208) *Ego   stoʃnilo*
      he.ACC became-nauseated[-AGR]
      'He vomited.'

                                                        (Liskova 2011, 1)

These constructions are not passives since, like the Japanese analogs, the addition of an oblique agent (but not an inanimate causer argument) results in ungrammatically:

(209) a.   *Dver'   byl-a raspaxnut-a vetr-om/devochk-oj.*
            Door.NOM.F.SG   was-F swung-open wind-INST/girl-INST
            'The door was swung open by the wind/by the girl.'   Passive

      b.   *Dver' raspaxnulo   vetr-om/* devochk-oj.*
            door.ACC swing-open[-AGR] wind-INST/girl-INST
            'The door was swung opened by the wind/by the girl.'   AI

                                                        (Babby 1994, 35)

These constructions are also not anticausatives, for which there is an oblique causer and a verb marked with the versatile *–sja*:

(210) a.   *Stavn-ja   raspaxnu-l-a-s'   ot vetr-a.*
            shutter-NOM.F.SG   swing-open-PAST.F.SJA from wind-GEN
            'The shutter swung open from wind.'   Anticausative

      b.   *Stavn-ju   raspaxnulo   vetr-om.*
            shutter-ACC swing-open[-AGR] wind-INST
            'The shutter swung open by the wind.'   Adversity Impersonal

Instead, as suggested by the gloss in (210b), the adversity impersonal is commonly analyzed (by, e.g. Lavine 2010, Liskova 2011, *inter alia*) as underlyingly causative. Some of the evidence for this claim includes the fact that, for intransitive verbs, for which there would be no causer argument to suppress, adversity impersonals are impossible. Additionally, if an adversity impersonal is combined with an explicit denial that the event was caused, the result is contradiction (Liskova 2011, 9). Of course, like Japanese, Russian adversity constructions differ from the English periphrastic causative *cause* in disallowing an agentive causer argument (cp. English *John caused the tragedy to occur*).[116]

Why, then, should the linguistic expression of causation be intertwined with negative sentiment? The data itself do not provide an answer to this question, but there is some suggestive research on the relationship between causation and affective states in the psychological literature – especially the sub-field of Attribution Theory, which explores how people attribute causes to outcomes and the consequences of those attributions. In particular, there are consistent and robust findings that causal attribution is often a means of emotional regulation and that there are strong affective consequences of those attributions (see Sweeton & Deerose 2010; Weiner 1980, 1985, 2010). Interestingly in light of the non-agentive Japanese and Russian constructions, causation and the experience of lack of control have particularly strong affective consequences and often the search for causes is motivated by a desire for mastery and control (Weiner 1974).

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[116] The adversity contructions in Russian and Japanese also do not obviously consistently express speaker sentiment. In Japanese, it is possible that the negative event is negative for the causer-marked argument, and in Russian the correct analysis and range of meaning for these constructions is still unclear. These questions are not pursued here.

In the case of agentive causation, it seems that the desire to assign blame is a central driver in causal attribution (Alicke 2010). In general it seems that negative events, in particular, motivate the search for causes in order to prevent them from occurring or occurring again, but also in order to make moral judgments, especially negative ones. Philosophical approaches to causation as a concept, too, recognize the importance of blame:

> The concept of causation has […] a role in a family of important practices. Perhaps the crucial one is the assignment of responsibility. When it is established that a person is causally responsible for some event, they are often subject to praise, blame, and sanction. […] [W]e might insist that there can be a non-causal basis for moral responsibility. But there is a great deal of pressure in the other direction. It becomes more unproblematic to hold you responsible if we treat your act as a cause. (Godfrey-Smith 2009, 336)

There are other unanswered questions concerning the phenomena addressed in this thesis, of course, in addition to those mentioned throughout the discussion. Some of the most salient include:

(A)   Is the negative sentiment always associated with the caused subevent or can it be shifted to the causer: *That idiot at the bar's obnoxious behavior at least caused the crowd to dissipate*?[117]

(B)   How do we handle an apparent non-scientific and not-obviously-negative restricted class of utterances involving NP complements of *cause* denoting disturbances? For example, the VPs *caused a disturbance/scene/stir…* and other expressions of reaction: *caused a ripple of surprise in the crowd*. Is this an exceptional class of idiom-like collocations? Is it similar to the pseudo-idiomatic[118] *drive-crazy* and its set of synonyms (*drove him out of his mind*)? Is it actually a case of negative sentiment at some level?

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[117] This example due to David Beaver (p.c.).

[118] Perhaps not actually idiomatic since synonyms do not usually participate in idiomatic phrase substitutions while maintaining the idiomatic meaning: #*The feline is out of the sack.*

(C)   How general is *make*? Is it actually polysemous as claimed by Wierzbicka and others? Why are sentences with complements containing the verb *die* so bad?:[119] *#she made him die.*[120] Is this just a blocking effect from the lexical *kill*, perhaps in combination with the pragmatic principle of Maximize Presuppositions (Heim 1991) and the generalization that death is negative – favoring *cause*? If so, is *make* felicitous in some specific context where the particular death is positive for the speaker and the causation indirect. Or is this a lacuna in a set of senses, of which there might be more?[121]

I have speculated on parts of question (C) in the previous chapters and I suspect (B) to be basically a case of a family of idiom-like strong collocations formed on the basis of analogy. In the case of (A), my intuitions are unstable, and it seems best to leave the question to future – ideally experimental – research.

But perhaps some discussion of some of the questions raised in chapter 2, in light of the subsequent discussion, is appropriate. The title of a recent paper on the linguistic expression of causation (Copley & Wolff 2013) tells us that "[t]heories of causation should inform linguistic theory and vice versa". The lack of a philosophical consensus on causation makes the former somewhat difficult here, beyond what has been done in the previous chapters, but to conclude, perhaps I could begin to take up the latter challenge with some data-driven speculation.

Can the findings about the periphrastic causatives say anything about theories of causation? In general, do the facts of the language of causation have

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[119] The exception to this is in the case of avatar death. If, for example, someone is playing a video game and is distracted, resulting in the death of the character, *you made me die* is perfectly felicitous.

[120] Luckily for the feature hierarchy analysis of the meaning of *make*, however, none of the proposed hyponyms seem to like this verb either: ??*She forced him to die*, ??*She got him to die*, ??*She had him die*.

[121] Furthermore, what significance should be placed on the *he made me do it* disavowal of responsibility (which, crucially, does not disavow volition, just responsibility, somehow). Does this just mean "I did it, but I didn't want to" in line with a general resistant directive causative? There are many questions surrounding *make*.

anything to say about theories of causation? These data do not directly prove anything about causation, of course. They concern only a single language and only a subset of causative constructions in that language. However, might they suggest anything about what the theory of causation ought to look like? I think they do.[122] In particular, I think they argue in favor of some mixture of Anti-Reductionism and Causal Pluralism, with a healthy dose of Humean Skepticism thrown in.

More specifically, I think the facts of acquisition of the causal concept, combined with the nature of argument structure, argue for some kind of Anti-Reductionism. It seems that there is a general grammatical dependency on the causal concept. Many linguists hold that some notion of causation (or, equivalently, force) is the answer to problems encountered in event theory and argument realization (see e.g., Copley & Harley 2012). If language is innate (an unresolved, but not improbable "if"), then some notion of causation is probably also innate. Furthermore, evidence suggests that children have a primitive Piaget-style "push/pull" notion of causation preverbally. It is likely that some notion of causation of this sort (or something more abstract and emotion-centered) is a cognitive primitive, irreducible to non-causative components. This, of course, speaks only to the epistemology of causation, but the concerns of the skeptics, the Eliminativists, the Logical Positivists, modern physics, and perhaps even the findings discussed here (see below) suggest that epistemology might indeed be the domain of causation.

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[122] Note, too, that at least one prominent and influential theory of causation (Anscombe 1971) is based fundamentally on the differences in the lexical versus periphrastic expressions of causation in English.

However, the existence of a conceptual cognitive primitive does not entail that causation is univocal. Perhaps a number of causal concepts are generated via different analogies with the primitive concept, resulting in a set of family resemblances. The myriad causal expressions and the seeming impossibility of unproblematic generalization suggest some variety of Causal Pluralism. As shown here, there is no general causative verb in English.[123] Perhaps that is because there is no general concept. The non-overlapping expressions of causation in English – direct and indirect, with adverse subtype, manipulative and directive, with inclinational subtypes – might be a reflection of the plurality of the causal concepts.

Finally, I believe that the data call for some Humean skepticism in light of the pervasive affective and evaluative associations with causative constructions (as well as the near-invisibility of the former to reflection). These might suggest that the unitary concept of causation is being projected on experiences by people, rather than being neutrally observed.[124] Perhaps the emotional and affective associations with causation both in and out of the linguistic domain, and its role in human motivation, suggest that it is primarily (if not wholly) a psychological construct, vindicating Hume. This can be true even if the idea that causation is a real relation existing between things in the world and outside of our conception of it is a "default position" as John Searle puts it, a "taken-for-granted presupposition [that is] part of … the Background of our thought and language" (Searle 1998 pg. 10). This, of course, is not to deny that there exist mind-independent objects and phenomena in

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[123] Recall that *make* is infelicitous in sentences describing an enabling causative event.

[124] Of course, non-objective doesn't mean the concept can simply be discarded. Causation seems to be a part of the background cognitive operating system – it might be impossible to have any coherent conception of experience, especially of time, without the concept of cause.

the world, that is not in question, but only to leave open the question whether causation as we understand it is one such phenomenon.

Of course, all that would be required is an exceptionless, truth-conditional, non-disjunctive account of causation to prove these speculations totally wrong.

Appendix

1.   Corpus Data

The table below displays the total counts in the Corpus of Contemporary English (COCA) for the representative lemmatized verbs examined here in respective periphrastic causative collocation frames (i.e. "[cause] me|him|it to [be]"). Frequency-ordered bargraphs for the natural logarithms of these counts (plus 1 for all counts, to avoid $-\infty$ logarithmic values) follow. (e.g. $\ln(119+1) = 4.78749$).

	Cause	Make	Force	Get	Allow	Set	Let	Have
Be	119	87	43	40	431	0	1751	148
Take	17	183	88	37	112	0	1222	63
Work	1	1317	15	84	75	9	126	29
Seem	0	1062	0	0	1	0	3	7
Know	0	45	0	1	10	0	2235	2
Stay	2	74	16	20	60	0	300	29
Lose	78	87	3	5	4	0	20	5
Do	17	486	76	100	217	4	894	150
Talk	1	46	7	80	13	0	630	8
Happen	20	913	3	1	76	0	338	60
See	5	182	11	19	124	1	1661	13
Let	4	15	3	15	8	0	201	5
Miss	50	46	35	1	2	0	7	3
Leave	11	74	51	25	30	0	128	15
Stop	16	322	36	74	14	0	252	9
Ask	6	34	7	2	18	0	7000	6
Look	21	2517	36	25	26	0	202	40
Come	8	248	15	48	59	2	558	216
Fall	32	76	1	4	6	0	264	20
Make	12	29	44	20	112	0	689	33
Feel	27	4919	4	3	19	0	67	10
Tell	1	43	6	31	15	0	3486	30
Get	16	102	17	13	105	1	2510	28
Try	2	23	4	9	6	0	532	12
Think	28	1267	13	14	18	0	333	3
Go	20	547	44	85	112	3	4989	195

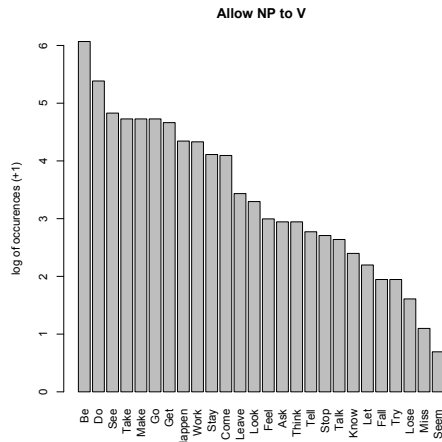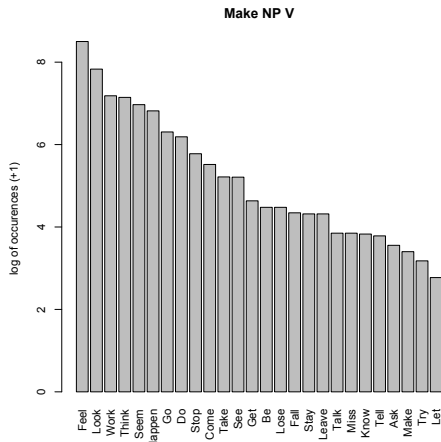Figure 60: Counts for periphrastic collocate verb in CAUSE NP (to) V frame.
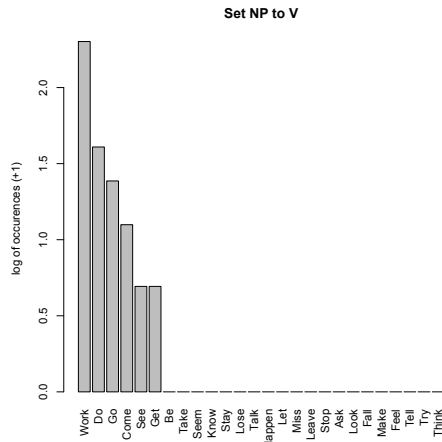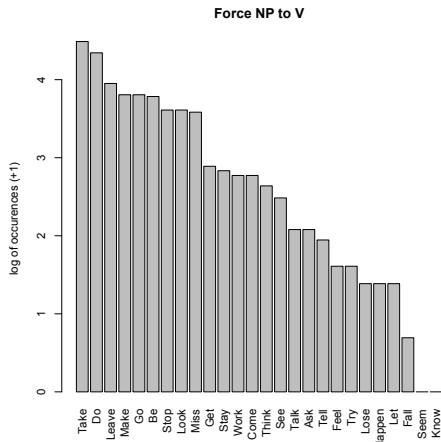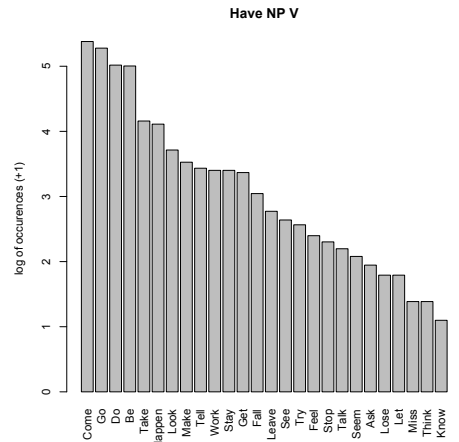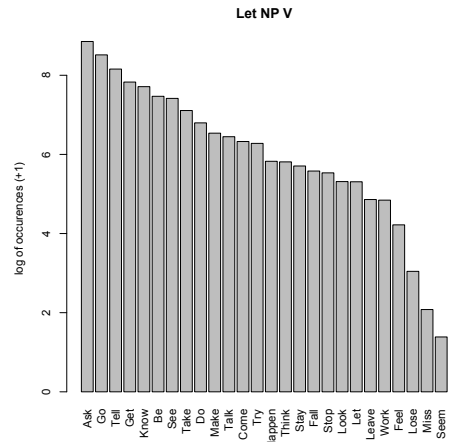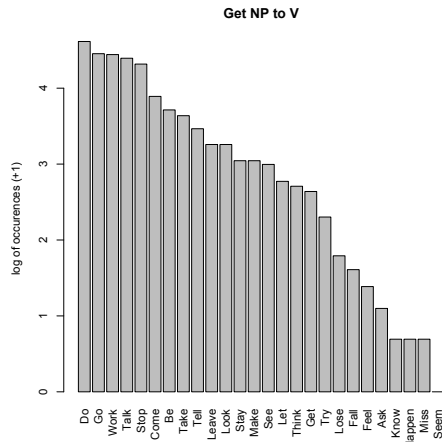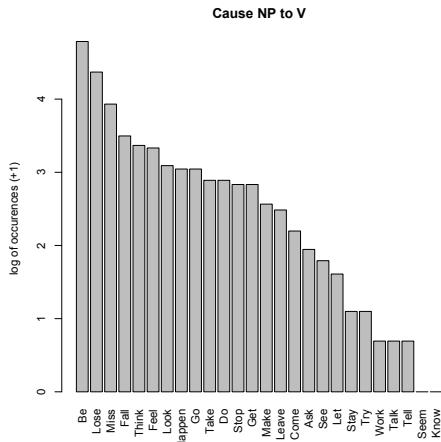
Figure 61: Bar graphs for log of collocate verb counts (+1)

The table below displays collocate count values normalized by the total number of verb collocates in the COCA for the respective periphrastic causative. For example, 1853 verbs occurred in the "[cause] me|him|it to [*v*]" frame; 119/1853 = 0.06422. Frequency-ordered bargraphs of these values follow.

	Cause	Make	Force	Get	Allow	Set	Let	Have
Be	0.06422	0.00388	0.02121	0.01918	0.06755	0.00000	0.03712	0.01582
Take	0.00917	0.00816	0.04341	0.01774	0.01755	0.00000	0.02591	0.00674
Work	0.00054	0.05873	0.00740	0.04027	0.01176	0.08411	0.00267	0.00310
Seem	0.00000	0.04736	0.00000	0.00000	0.00016	0.00000	0.00006	0.00075
Know	0.00000	0.00201	0.00000	0.00048	0.00157	0.00000	0.04738	0.00021
Stay	0.00108	0.00330	0.00789	0.00959	0.00940	0.00000	0.00636	0.00310
Lose	0.04209	0.00388	0.00148	0.00240	0.00063	0.00000	0.00042	0.00053
Do	0.00917	0.02167	0.03749	0.04794	0.03401	0.03738	0.01895	0.01604
Talk	0.00054	0.00205	0.00345	0.03835	0.00204	0.00000	0.01336	0.00086
Happen	0.01079	0.04071	0.00148	0.00048	0.01191	0.00000	0.00717	0.00641
See	0.00270	0.00812	0.00543	0.00911	0.01944	0.00935	0.03521	0.00139
Let	0.00216	0.00067	0.00148	0.00719	0.00125	0.00000	0.00426	0.00053
Miss	0.02698	0.00205	0.01727	0.00048	0.00031	0.00000	0.00015	0.00032
Leave	0.00594	0.00330	0.02516	0.01198	0.00470	0.00000	0.00271	0.00160
Stop	0.00863	0.01436	0.01776	0.03547	0.00219	0.00000	0.00534	0.00096
Ask	0.00324	0.00152	0.00345	0.00096	0.00282	0.00000	0.14840	0.00064
Look	0.01133	0.11224	0.01776	0.01198	0.00408	0.00000	0.00428	0.00428
Come	0.00432	0.01106	0.00740	0.02301	0.00925	0.01869	0.01183	0.02309
Fall	0.01727	0.00339	0.00049	0.00192	0.00094	0.00000	0.00560	0.00214
Make	0.00648	0.00129	0.02171	0.00959	0.01755	0.00000	0.01461	0.00353
Feel	0.01457	0.21935	0.00197	0.00144	0.00298	0.00000	0.00142	0.00107
Tell	0.00054	0.00192	0.00296	0.01486	0.00235	0.00000	0.07390	0.00321
Get	0.00863	0.00455	0.00839	0.00623	0.01646	0.00935	0.05321	0.00299
Try	0.00108	0.00103	0.00197	0.00431	0.00094	0.00000	0.01128	0.00128
Think	0.01511	0.05650	0.00641	0.00671	0.00282	0.00000	0.00706	0.00032
Go	0.01079	0.02439	0.02171	0.04075	0.01755	0.02804	0.10577	0.02085

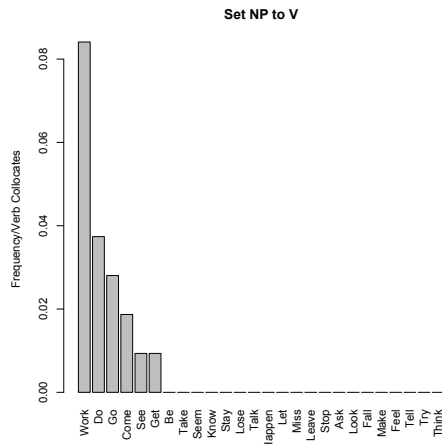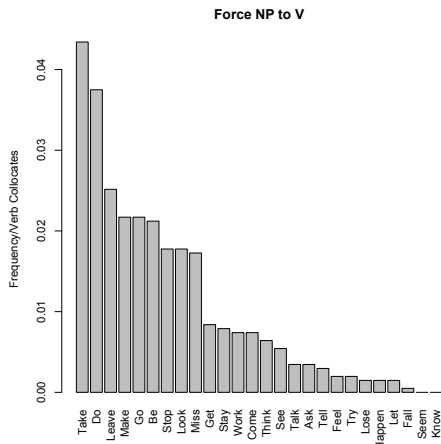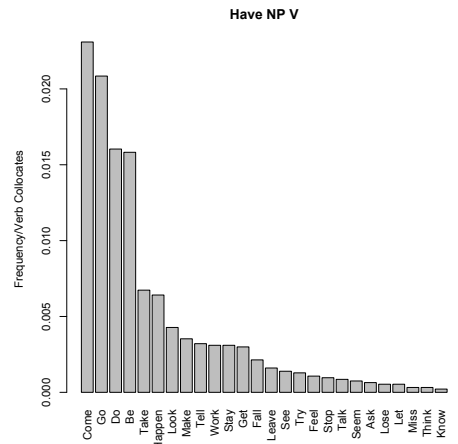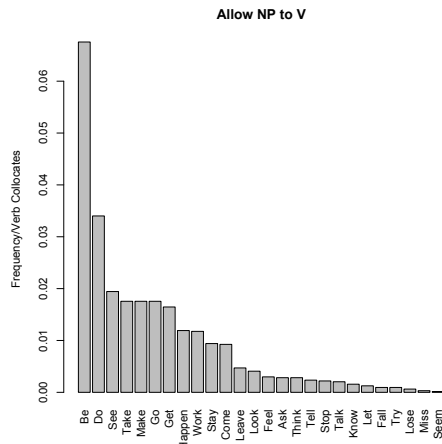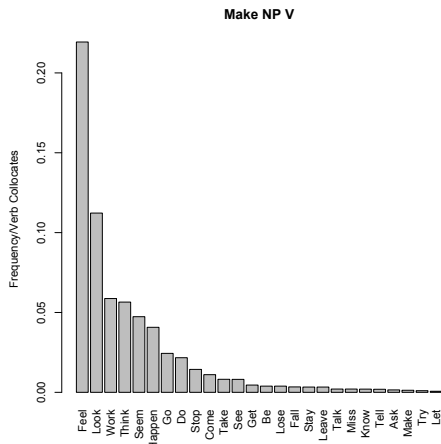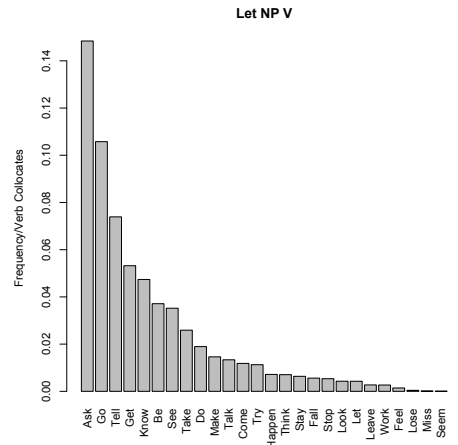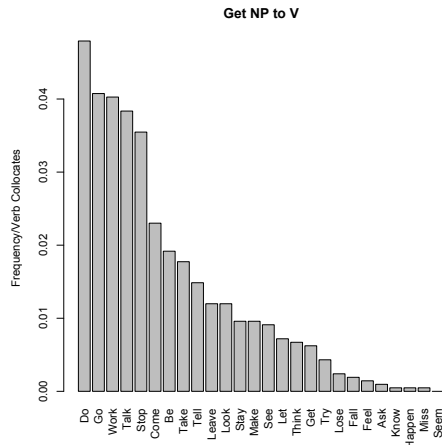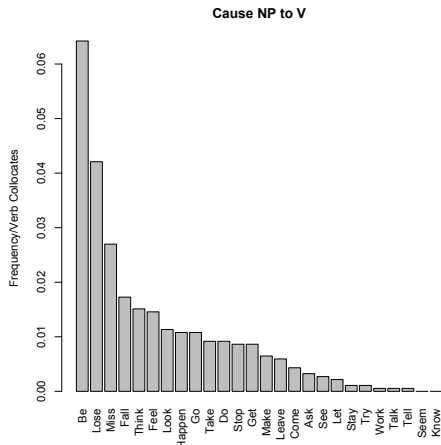Figure 62: Verb collocates normalized by total number of verb collocates for each causative.

Figure 63: Bar graphs for verb collocates normalized by total number of verb collocates for each causative.

The final table displays values for the counts of each lemmatized collocate verb in respective periphrastic frames normalized by the total occurrence of the collocate verb in the COCA. For example, there are 1942849 occurrences of some form of *be* in the COCA; 119/1942849 = 0.00006125. Frequency ordered bargraphs for these values follow.

	Cause	Make	Force	Get	Allow	Set	Let	Have
Be	0.00006	0.00004	0.00002	0.00002	0.00022	0.00000	0.00090	0.00008
Take	0.00006	0.00060	0.00029	0.00012	0.00037	0.00000	0.00401	0.00021
Work	0.00000	0.00400	0.00005	0.00026	0.00023	0.00003	0.00038	0.00009
Seem	0.00000	0.01645	0.00000	0.00000	0.00002	0.00000	0.00005	0.00011
Know	0.00000	0.00007	0.00000	0.00000	0.00002	0.00000	0.00341	0.00000
Stay	0.00003	0.00105	0.00023	0.00028	0.00085	0.00000	0.00424	0.00041
Lose	0.00215	0.00240	0.00008	0.00014	0.00011	0.00000	0.00055	0.00014
Do	0.00001	0.00035	0.00005	0.00007	0.00016	0.00000	0.00065	0.00011
Talk	0.00001	0.00336	0.00051	0.00584	0.00095	0.00000	0.04601	0.00058
Happen	0.00035	0.01597	0.00005	0.00002	0.00133	0.00000	0.00591	0.00105
See	0.00001	0.00041	0.00002	0.00004	0.00028	0.00000	0.00377	0.00003
Let	0.00002	0.00006	0.00001	0.00006	0.00003	0.00000	0.00087	0.00002
Miss	0.00138	0.00127	0.00096	0.00003	0.00006	0.00000	0.00019	0.00008
Leave	0.00014	0.00096	0.00066	0.00032	0.00039	0.00000	0.00166	0.00019
Stop	0.00020	0.00412	0.00046	0.00095	0.00018	0.00000	0.00323	0.00012
Ask	0.00006	0.00036	0.00007	0.00002	0.00019	0.00000	0.07322	0.00006
Look	0.00008	0.00968	0.00014	0.00010	0.00010	0.00000	0.00078	0.00015
Come	0.00003	0.00087	0.00005	0.00017	0.00021	0.00001	0.00196	0.00076
Fall	0.00052	0.00124	0.00002	0.00007	0.00010	0.00000	0.00429	0.00033
Make	0.00003	0.00008	0.00012	0.00005	0.00030	0.00000	0.00184	0.00009
Feel	0.00019	0.03467	0.00003	0.00002	0.00013	0.00000	0.00047	0.00007
Tell	0.00001	0.00025	0.00003	0.00018	0.00009	0.00000	0.02001	0.00017
Get	0.00003	0.00019	0.00003	0.00002	0.00020	0.00000	0.00473	0.00005
Try	0.00002	0.00022	0.00004	0.00009	0.00006	0.00000	0.00512	0.00012
Think	0.00005	0.00217	0.00002	0.00002	0.00003	0.00000	0.00057	0.00001
Go	0.00005	0.00139	0.00011	0.00022	0.00029	0.00001	0.01272	0.00050

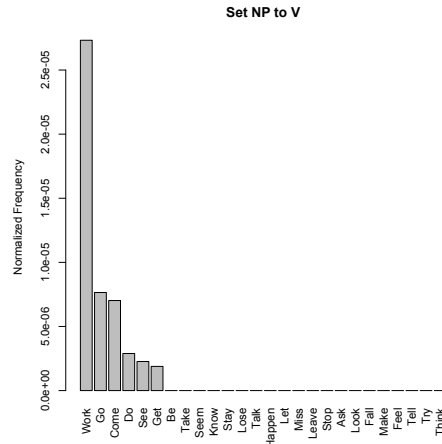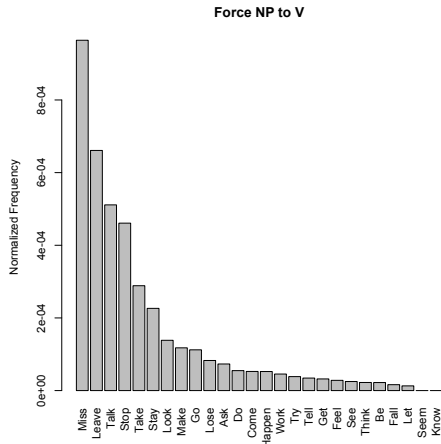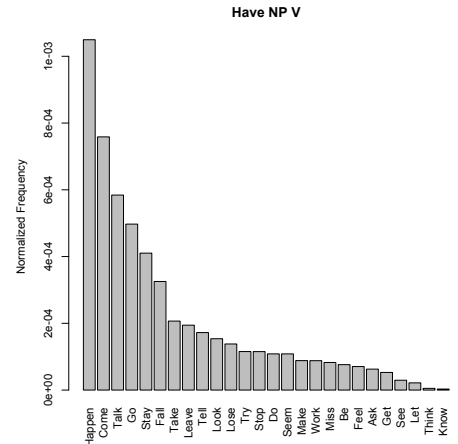Figure 64: Verb collocates for each causative normalized the total count of the collocate in the corpus.
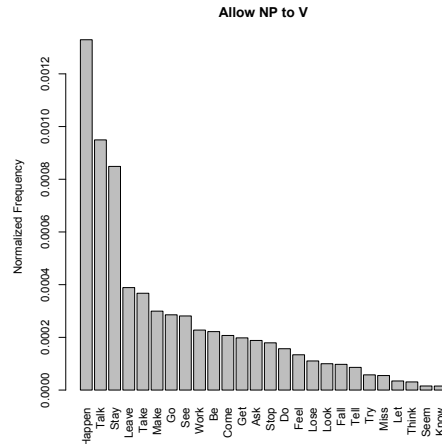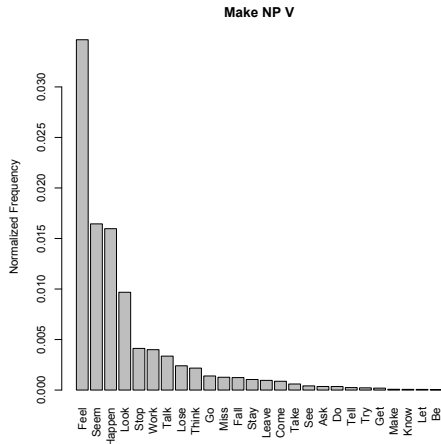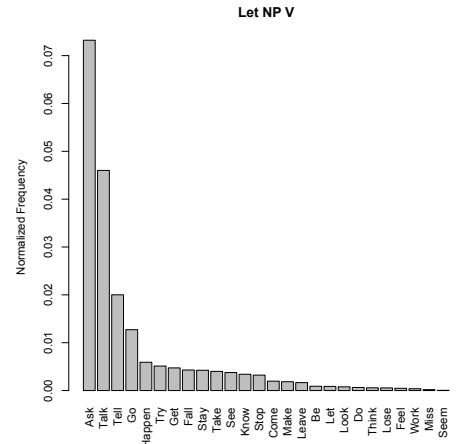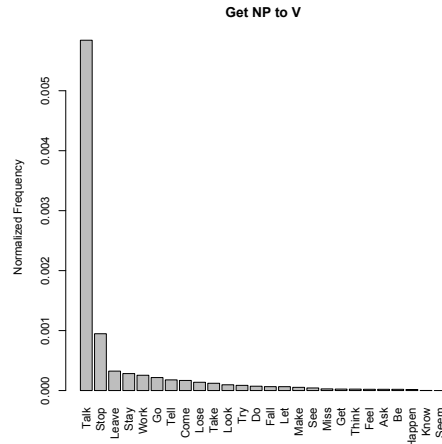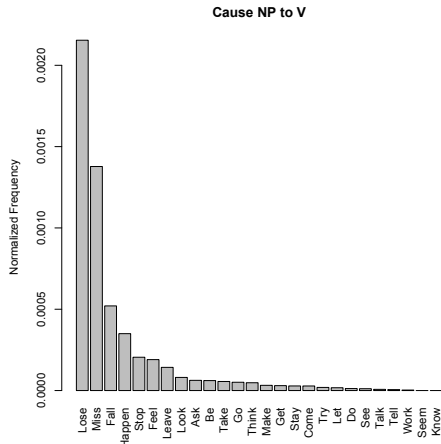
Figure 65: Bar-graphs for verb collocates normalized the total count of the collocate in the corpus.

Based on the collocate verb frequency vectors, correlations of the various periphrastic causative verbs are given below. A clustering graph based on these correlations, and a clustering graph including only the effectuating causatives (excluding *let* and *allow*), follow:

```
              Cause         Force          Get        Allow         Drive          Set
Cause   1.000000000  0.181265735 -0.09065341   0.5662312 -0.165704063 -0.16849183
Force   0.181265735  1.000000000  0.49340523   0.5027562  0.577972380  0.15693018
Get    -0.090653412  0.493405232  1.00000000   0.3523242  0.576819319  0.63477907
Allow   0.566231173  0.502756217  0.35232422   1.0000000  0.291300113  0.20791543
Drive  -0.165704063  0.577972380  0.57681932   0.2913001  1.000000000  0.74589541
Set    -0.168491832  0.156930182  0.63477907   0.2079154  0.745895409  1.00000000
Make    0.006774044 -0.109284296 -0.08041174  -0.1257218 -0.003083164  0.09327104
Let    -0.096118849  0.006848722  0.06295356   0.1427167 -0.101552324  0.01896175
Have    0.227732961  0.437482837  0.53966068   0.5973067  0.226406648  0.34576596
               Make          Let         Have
Cause   0.006774044 -0.096118849  0.22773296
Force  -0.109284296  0.006848722  0.43748284
Get    -0.080411744  0.062953560  0.53966068
Allow  -0.125721790  0.142716713  0.59730667
Drive  -0.003083164 -0.101552324  0.22640665
Set     0.093271042  0.018961751  0.34576596
Make    1.000000000 -0.234424095 -0.07202675
Let    -0.234424095  1.000000000  0.21594231
Have   -0.072026747  0.215942312  1.00000000
~
```

Figure 66: Correlation between causatives based on collocate verb frequencies.
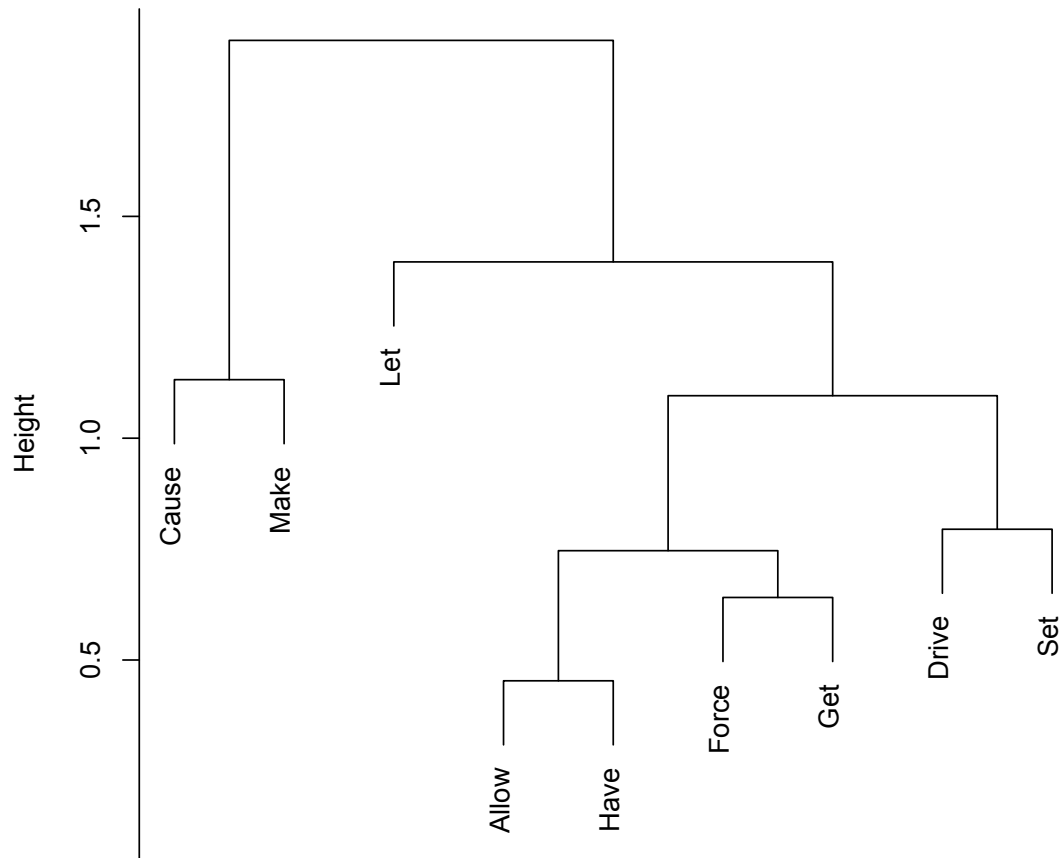
dist(cor(t(corpus), method = "spearman"))
hclust (*, "complete")

Figure 67: Clustering of causatives based on correlation.

corpus.eff.dist
hclust (*, "complete")
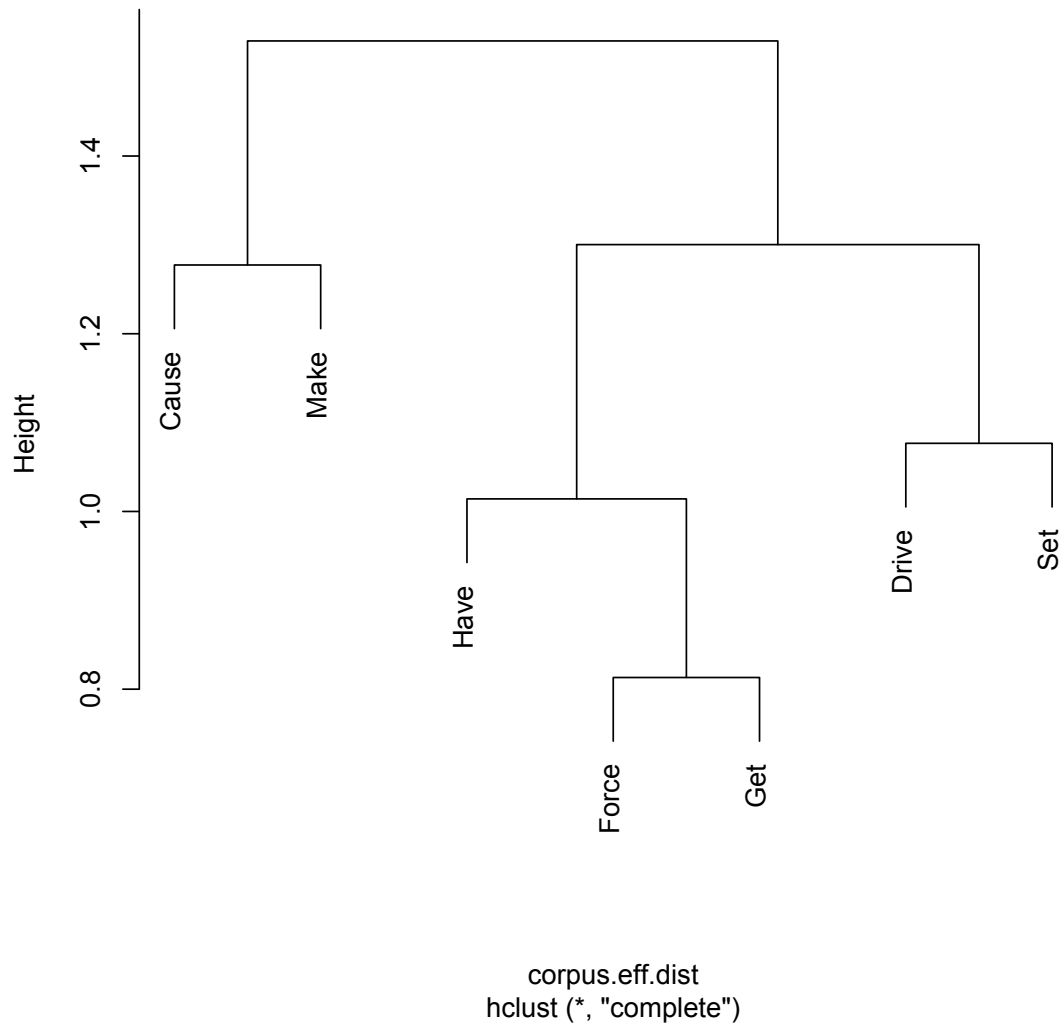
Figure 68: Clustering of effectuating causatives based on correlation.

	eagerly	grudgingly	weight	Let score	Get score	Force score
Be	314	36	0.7942857	0.0294847	0.0152308	0.0168497
Take	34	7	0.6585366	0.0170602	0.0116807	0.0285896
Work	9	0	1.0000000	0.0026712	0.0402685	0.0074001
Seem	2	1	0.3333333	0.0000212	0.0000000	0.0000000
Know	0	0	0.0000000	0.0000000	0.0000000	0.0000000
Stay	0	0	0.0000000	0.0000000	0.0000000	0.0000000
Lose	0	0	0.0000000	0.0000000	0.0000000	0.0000000
Do	6	8	-0.1428571	-0.0027075	-0.0068484	-0.0053563
Talk	17	0	1.0000000	0.0133559	0.0383509	0.0034534
Happen	0	0	0.0000000	0.0000000	0.0000000	0.0000000
See	0	0	0.0000000	0.0000000	0.0000000	0.0000000
Let	0	4.	-1.0000000	-0.0042612	-0.0071908	-0.0014800
Miss	0	0	0.0000000	0.0000000	0.0000000	0.0000000
Leave	1	3	-0.5000000	-0.0013568	-0.0059923	-0.0125802
Stop	0	0	0.0000000	0.0000000	0.0000000	0.0000000
Ask	50	2	0.9230769	0.1369841	0.0008850	0.0031877
Look	67	0	1.0000000	0.0042824	0.0119847	0.0177602
Come	10	11	-0.0476190	-0.0005633	-0.0010957	-0.0003524
Fall	1	2	-0.3333333	-0.0018656	-0.0006392	-0.0001644
Make	6	5	0.0909091	0.0013279	0.0008716	0.0019734
Feel	0	0	0.0000000	0.0000000	0.0000000	0.0000000
Tell	5	2	0.4285714	0.0316727	0.0063690	0.0012686
Get	2	2	0.0000000	0.0000000	0.0000000	0.0000000
Try	13	0	1.0000000	0.0112784	0.0043145	0.0019734
Think	2	1	0.3333333	0.0023532	0.0022371	0.0021378
Go	11	8	0.1578947	0.0167000	0.0064339	0.0034274

Figure 69: *eagerly* and *grudgingly* corpus counts and inclinational scores.

2.   Experimental Data

In Figure 70 below, all experimentally elicited sentiment rankings for adjectives that were provided in the *cause* frame of the first experimental block ("John cased the very _____ event to happen") are given, followed by a larger view of a sample of these scores in Figure 71. This is followed by a summary of the statistics of these results, including sentiment boxplots for all elicited adjectives. In Figure 73, the scores for all adjectives in the *make* frame are given ("John made the very _____ event happen"), followed by a sample of these scores in Figure 74. This, too, is followed by a summary of the statistics and boxplots. Elicited sentiment scores for all overlapping adjectives (adjectives provided in any of the elicitations, for either of the causative verbs) are taken from these ratings. Paired quartile boxplots comparing the mean sentiment ratings for *cause* and *make* from the two experimental blocks are given in the body chapters of the thesis.

In Figure 76 SentiWordNet positive and negative sentiment scores and their difference are presented. This is followed by a boxplot for these values showing extrema, quartiles, and mean.

Figure 70: Elicited sentiment scores for adjectives provided for the "cause" frame.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
bad	3	1	1		3			3		3										2	2
banal	4	1	4			3		1			3			3				3		3	4
beneficial	4	7	6	6		7										7	6			6	7
chaotic	2	1	2		4			2	2	6			1		3		1			2	2
crazy	3	1	3	2	4	4				5				4		7	5		3	3	5
crucial	2	1	2	3				5	4			2		2	2					6	6
detailed	6	7	4								7			4						5	5
disasterous	5	1	1		1		1					1			1		1	2		1	1
dreadful	2	1	1	1				3	1			1	1							1	1
exciting	6	7	6	7	5	7				6				7			7	7		7	6
extraordinary	6	7	7		5	7			7		7			7				7	5	7	7
extreme	4	7	4			4				6				4						4	3
fluid	4	7	6						5	4		5	5		4		6			5	4
fun	5	7	5		5				5	6				6	7	6	7	5	7	5	7
horrible	2	1	1			1		2	1			1	1	1				2	1	1	1
important	4	1	6	4	4		7				6			4		6			7	5	7
improbable	3	1	4				2				3	3	2	4	4		4			3	4
interesting	5	7	7								7						7	6		6	7
intriguing	5	7	4						6	6			6		5	6	7		6	5	6
joyous	5	7	7	7							7			7	7			7		7	6
late	3	1	3		3	3			4	3			2	3						3	2
memorable	6	7	7					5				6		4				6	7	5	7
new	4	7	6	5		6		5			6	5		4		6	6	7	6	4	6
nice	3	7	6	6	5									7	7		5	6	7	5	7
painful	2	1	2	1			2			4					1		2		1	2	1
problematic	4	1	1		3	2		3							4		3			3	1
random	4	7	4		4			4				4								4	4
recent	4	4	5	5		6	4	4	4	4	4				3	4		4	4	5	4
same	4	4	4	3		5	5				6				4		4			4	4
scary	3	1	2	3			1	3	3								1		1	2	2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
serious	5	1	4	4		3					3	4	3					3	4	4	4
short	4	1	4	4	4			4												3	3
small	4	1	4	4							3	3	4	4			4			3	5
somber	4	1	1								6					3				2	4
special	6	7	5					5	5								6	5		6	7
strange	3	1	2							4		3								3	3
successful	6	7	7		6					6		7				5		7	7	6	7
surprising	6	6	6									4			4				4	4	5
terrible	1	1	1		1	1	1		1				1			1	1			1	1
troublesome	2	1	1		3			3					2			1			1	2	1
troubling	3	1	1			3		3			1			3	1		3			2	1
unexpected	4	1	4						4			3			3			4	4	3	5
unique	3	7	6			6		5			6	5			5	7	7			5	7
unlikely	3	1	3	3						4	3			4				4		3	2
unusual	3	1	3		3	4				5	3	3			2		5		4	3	5
wild	6	7	4	3		6		5	6							7		4		2	3

Figure 71: Larger view of sample of "cause" frame sentiment ratings.

bad	banal	beneficial	chaotic	crazy
Min. :1.000	Min. :1.000	Min. :4.000	Min. :1.000	Min. :1.000
1st Qu.:1.000	1st Qu.:3.000	1st Qu.:6.000	1st Qu.:2.000	1st Qu.:3.000
Median :2.000	Median :3.000	Median :6.000	Median :2.000	Median :4.000
Mean :1.955	Mean :2.955	Mean :6.182	Mean :2.414	Mean :3.655
3rd Qu.:2.750	3rd Qu.:3.750	3rd Qu.:7.000	3rd Qu.:3.000	3rd Qu.:4.000
Max. :3.000	Max. :4.000	Max. :7.000	Max. :6.000	Max. :7.000
NA's :21	NA's :21	NA's :21	NA's :14	NA's :14

crucial	detailed	disasterous	dreadful	exciting
Min. :1.000	Min. :1.000	Min. :1.000	Min. :1.000	Min. :5.000
1st Qu.:3.000	1st Qu.:4.000	1st Qu.:1.000	1st Qu.:1.000	1st Qu.:6.000
Median :4.000	Median :5.000	Median :1.000	Median :1.000	Median :6.000
Mean :3.769	Mean :4.765	Mean :1.286	Mean :1.333	Mean :6.345
3rd Qu.:4.000	3rd Qu.:6.000	3rd Qu.:1.000	3rd Qu.:1.000	3rd Qu.:7.000
Max. :6.000	Max. :7.000	Max. :5.000	Max. :3.000	Max. :7.000
NA's :17	NA's :26	NA's :15	NA's :22	NA's :14

extraordinary	extreme	fluid	fun	horrible
Min. :5.000	Min. :1.00	Min. :4.000	Min. :5.000	Min. :1.00
1st Qu.:6.000	1st Qu.:4.00	1st Qu.:4.000	1st Qu.:5.000	1st Qu.:1.00
Median :6.500	Median :4.00	Median :5.000	Median :6.000	Median :1.00
Mean :6.308	Mean :4.05	Mean :4.852	Mean :6.138	Mean :1.25
3rd Qu.:7.000	3rd Qu.:4.00	3rd Qu.:5.500	3rd Qu.:7.000	3rd Qu.:1.00
Max. :7.000	Max. :7.00	Max. :7.000	Max. :7.000	Max. :3.00
NA's :17	NA's :23	NA's :16	NA's :14	NA's :11

important	improbable	interesting	intriguing	joyous
Min. :1.00	Min. :1.000	Min. :4.000	Min. :4.0	Min. :1.000
1st Qu.:4.00	1st Qu.:3.000	1st Qu.:5.000	1st Qu.:5.0	1st Qu.:6.000
Median :4.00	Median :3.000	Median :6.000	Median :6.0	Median :7.000
Mean :4.64	Mean :3.174	Mean :5.818	Mean :5.5	Mean :6.375
3rd Qu.:6.00	3rd Qu.:4.000	3rd Qu.:7.000	3rd Qu.:6.0	3rd Qu.:7.000
Max. :7.00	Max. :5.000	Max. :7.000	Max. :7.0	Max. :7.000
NA's :18	NA's :20	NA's :21	NA's :17	NA's :19

late	memorable	new	nice	painful
Min. :1.00	Min. :4.000	Min. :4.00	Min. :3.00	Min. :1.000
1st Qu.:2.00	1st Qu.:5.000	1st Qu.:4.00	1st Qu.:5.00	1st Qu.:1.000
Median :3.00	Median :6.000	Median :5.00	Median :6.00	Median :1.000
Mean :2.72	Mean :5.704	Mean :5.31	Mean :5.84	Mean :1.577
3rd Qu.:3.00	3rd Qu.:6.000	3rd Qu.:6.00	3rd Qu.:7.00	3rd Qu.:2.000
Max. :4.00	Max. :7.000	Max. :7.00	Max. :7.00	Max. :4.000
NA's :18	NA's :16	NA's :14	NA's :18	NA's :17

problematic
Min.   :1.000
1st Qu.:1.500
Median :2.000
Mean   :2.217
3rd Qu.:3.000
Max.   :4.000
NA's   :20

random
Min.   :1.000
1st Qu.:4.000
Median :4.000
Mean   :4.042
3rd Qu.:4.000
Max.   :7.000
NA's   :19

recent
Min.   :3.000
1st Qu.:4.000
Median :4.000
Mean   :4.129
3rd Qu.:4.000
Max.   :6.000
NA's   :12

same
Min.   :2.000
1st Qu.:4.000
Median :4.000
Mean   :4.043
3rd Qu.:4.000
Max.   :6.000
NA's   :20

scary
Min.   :1.000
1st Qu.:2.000
Median :2.000
Mean   :2.192
3rd Qu.:3.000
Max.   :4.000
NA's   :17

serious
Min.   :1.0
1st Qu.:3.0
Median :4.0
Mean   :3.6
3rd Qu.:4.0
Max.   :6.0
NA's   :13

short
Min.   :1.00
1st Qu.:3.75
Median :4.00
Mean   :3.60
3rd Qu.:4.00
Max.   :4.00
NA's   :23

small
Min.   :1.00
1st Qu.:4.00
Median :4.00
Mean   :3.63
3rd Qu.:4.00
Max.   :5.00
NA's   :16

somber
Min.   :1.000
1st Qu.:2.000
Median :3.000
Mean   :3.136
3rd Qu.:4.000
Max.   :6.000
NA's   :21

special
Min.   :4.000
1st Qu.:5.000
Median :6.000
Mean   :5.542
3rd Qu.:6.000
Max.   :7.000
NA's   :19

strange
Min.   :1
1st Qu.:3
Median :3
Mean   :3
3rd Qu.:3
Max.   :4
NA's   :23

successful
Min.   :5.000
1st Qu.:6.000
Median :7.000
Mean   :6.517
3rd Qu.:7.000
Max.   :7.000
NA's   :14

surprising
Min.   :4.000
1st Qu.:4.000
Median :4.000
Mean   :4.609
3rd Qu.:5.000
Max.   :7.000
NA's   :20

terrible
Min.   :1.000
1st Qu.:1.000
Median :1.000
Mean   :1.231
3rd Qu.:1.000
Max.   :4.000
NA's   :17

troublesome
Min.   :1.000
1st Qu.:1.000
Median :2.000
Mean   :2.083
3rd Qu.:3.000
Max.   :6.000
NA's   :19

troubling
Min.   :1.000
1st Qu.:1.250
Median :2.000
Mean   :2.077
3rd Qu.:3.000
Max.   :3.000
NA's   :17

unexpected
Min.   :1.000
1st Qu.:3.500
Median :4.000
Mean   :3.696
3rd Qu.:4.000
Max.   :5.000
NA's   :20

unique
Min.   :3.00
1st Qu.:5.00
Median :5.00
Mean   :5.50
3rd Qu.:6.25
Max.   :7.00
NA's   :15

unlikely
Min.   :1.000
1st Qu.:3.000
Median :3.000
Mean   :3.136
3rd Qu.:4.000
Max.   :4.000
NA's   :21

unusual
Min.   :1.000
1st Qu.:3.000
Median :4.000
Mean   :3.484
3rd Qu.:4.000
Max.   :5.000
NA's   :12

wild
Min.   :2.000
1st Qu.:4.000
Median :4.500
Mean   :4.538
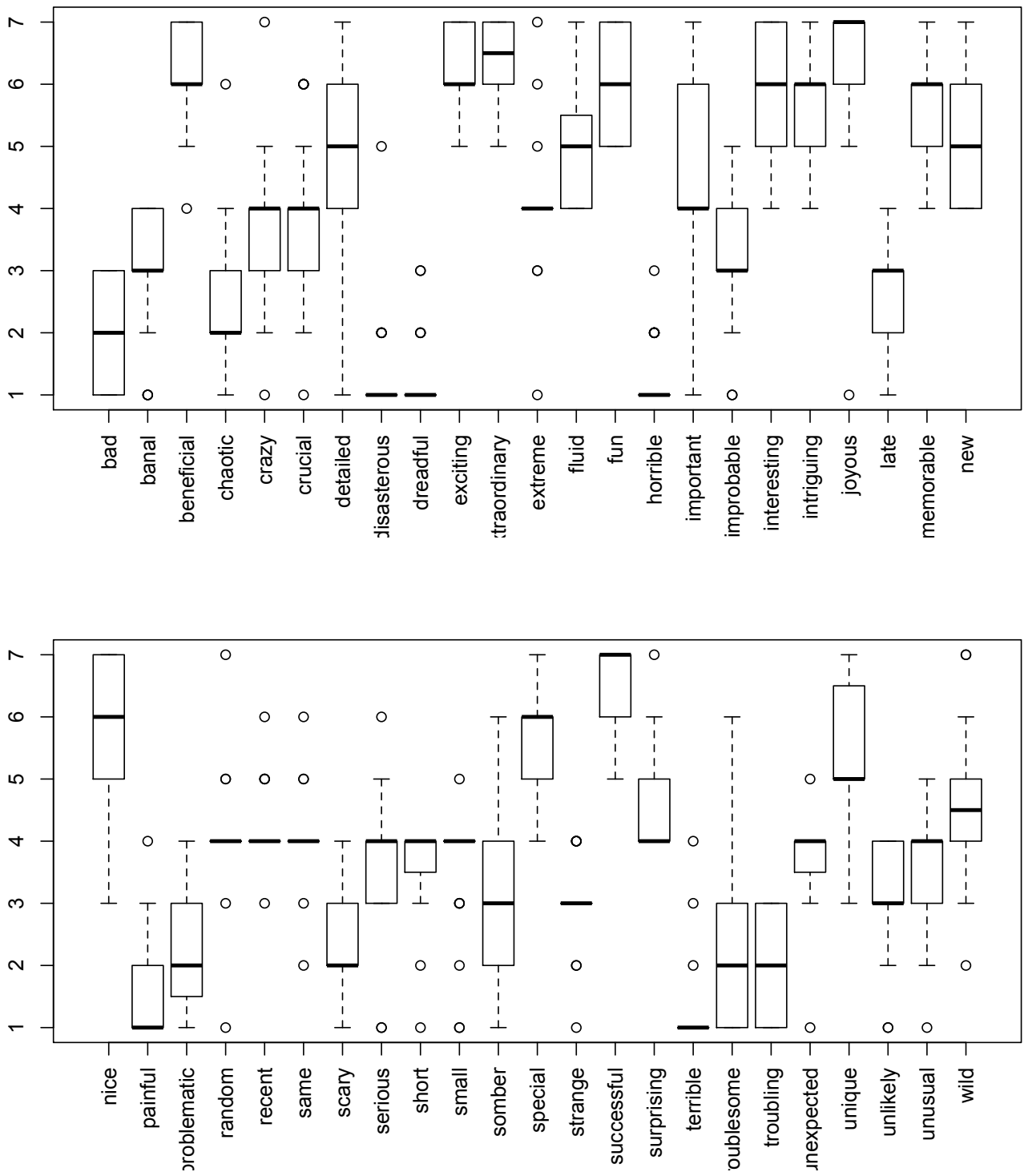3rd Qu.:5.000
Max.   :7.000
NA's   :17

Figure 72: Boxplots for sentiment ratings for adjectives elicited with *cause* sentence frame.

Figure 73: Elicited sentiment scores for adjectives provided for the "make" frame.

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
annoying	2	1	1					3	3	1	1			1		1		2	1	2	1
anticipated	4	4	5	5	5				4		6				4					5	3
astonishing	3	7	7		5	7	5	6			7		7			7	7			4	6
awesome	5	7	6		5			6	7	7		7			6	6	7			7	6
awkward	4	1	3	3		4	1			5	2	2				3	3	3		3	2
bad	3	1	1		3			3		3										2	2
big	4	7	4	4				4	5	4	5			4	4	4			4	5	6
bland	7	1	2					3			1	3	4	3				2	3	3	1
boring	3	1	2		3		2				1		2		1	2		2		3	1
calm	4	7	4		5				4	4	7	7		5	5		6	5	4	5	3
convoluted	3	1	4	3		1		3	2		1	3	4							3	4
crazy	3	1	3	2	4	4				5				4		7	5		3	3	5
cute	5	7	6					5				6				6				6	5
delightful	5	7	7			7			7							7		6	7	7	6
difficult	3	1	3		3			3	3	4		3	3	2	1			3		2	2
droll	3	1	3	3		1			3				2	3						3	4
elegant	6	7	6				7			5				6	5	7			6	6	7
exciting	6	7	6		5	7				6			7		7		7			7	6
exclusive	4	7	4	7				5			2	4		4		6				3	6
explosive	5	4	4	4			4			6			5		1	1		4		1	6
fun	5	7	5		5				5	6				6	7	6	7	5	7	5	7
futuristic	6	7	4		4		5					6	4	5	6					5	4
good	7	7	6	6			6						5							5	5
grand	5	7	6		6	6						6	7							7	7
happy	5	7	7			7			5							6			7	7	6
important	4	1	6	4	4		7				6		4			6			7	5	7
interesting	5	7	7								7						7	6		6	7
large	4	7	4								5								4	6	2
long	4	7	4	4	4		3			4		4	4	4						4	5
lovely	4	7	6	6		7			6				7	7	7		7		7	7	6
lucrative	4	7	3		5						6		4					6		6	4
magical	3	7	5	6		7		7	6	6			7	6		7		6	7	7	5
positive	6	7	7	6	5					7				7		7		6	7	5	7
random	4	7	4		4			4				4								4	4
recent	4	4	5	5		6	4	4	4	4	4				3	4		4	4	5	4
sad	3	1	3		2	2			3				3			1	2			2	1
scandalous	1	1	3	2												2			2	2	2
scary	3	1	2	3			1	3	3								1		1	2	2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
smooth	5	7	4			6			5	5	7		4			6			5	5	5	
special	6	7	5					5	5								6	5		6	7	
successful	6	7	7		6					6		7				5		7	7	6	7	
surprising	6	6	6									4			4				4	4	5	
unlikely	3	1	3	3						4	3			4				4		3	2	
unusual	3	1	3		3	4				5	3	3			2		5		4	3	5	
wonderful	6	7	7		6	7		6	7	6	7	7	7					5	7	7	7	

Figure 74: Larger view of sample of "make" frame sentiment ratings.

annoying	anticipated	astonishing	awesome	awkward
Min. :1.000	Min. :3.000	Min. :3.000	Min. :5.000	Min. :1.000
1st Qu.:1.000	1st Qu.:4.000	1st Qu.:5.000	1st Qu.:6.000	1st Qu.:2.000
Median :2.000	Median :4.000	Median :6.000	Median :7.000	Median :3.000
Mean :1.808	Mean :4.607	Mean :5.724	Mean :6.536	Mean :2.767
3rd Qu.:2.000	3rd Qu.:5.000	3rd Qu.:7.000	3rd Qu.:7.000	3rd Qu.:3.750
Max. :4.000	Max. :7.000	Max. :7.000	Max. :7.000	Max. :5.000
NA's :17	NA's :15	NA's :14	NA's :15	NA's :13

bad	big	bland	boring	calm
Min. :1.000	Min. :4.0	Min. :1.000	Min. :1.000	Min. :3.000
1st Qu.:1.000	1st Qu.:4.0	1st Qu.:2.000	1st Qu.:1.500	1st Qu.:4.000
Median :2.000	Median :4.0	Median :3.000	Median :2.000	Median :5.000
Mean :1.955	Mean :4.5	Mean :2.741	Mean :2.185	Mean :4.967
3rd Qu.:2.750	3rd Qu.:5.0	3rd Qu.:3.000	3rd Qu.:3.000	3rd Qu.:6.000
Max. :3.000	Max. :7.0	Max. :7.000	Max. :3.000	Max. :7.000
NA's :21	NA's :15	NA's :16	NA's :16	NA's :13

convoluted	crazy	cute	delightful	difficult
Min. :1.000	Min. :1.000	Min. :4.000	Min. :5.00	Min. :1.00
1st Qu.:2.000	1st Qu.:3.000	1st Qu.:5.000	1st Qu.:6.00	1st Qu.:2.00
Median :3.000	Median :4.000	Median :6.000	Median :7.00	Median :3.00
Mean :2.815	Mean :3.679	Mean :5.667	Mean :6.48	Mean :2.63
3rd Qu.:4.000	3rd Qu.:4.000	3rd Qu.:6.000	3rd Qu.:7.00	3rd Qu.:3.00
Max. :4.000	Max. :7.000	Max. :7.000	Max. :7.00	Max. :5.00
NA's :16	NA's :15	NA's :22	NA's :18	NA's :16

droll	elegant	exciting	exclusive	explosive
Min. :1.000	Min. :4.00	Min. :5.000	Min. :2.0	Min. :1.00
1st Qu.:2.000	1st Qu.:6.00	1st Qu.:6.000	1st Qu.:4.0	1st Qu.:2.25
Median :3.000	Median :6.00	Median :6.000	Median :4.0	Median :4.00
Mean :2.786	Mean :6.08	Mean :6.321	Mean :4.6	Mean :3.50
3rd Qu.:3.000	3rd Qu.:7.00	3rd Qu.:7.000	3rd Qu.:5.0	3rd Qu.:4.00
Max. :5.000	Max. :7.00	Max. :7.000	Max. :7.0	Max. :6.00
NA's :15	NA's :18	NA's :15	NA's :18	NA's :17

fun	futuristic	good	grand	happy
Min. :5.000	Min. :4.000	Min. :5.000	Min. :5.00	Min. :5.000
1st Qu.:5.000	1st Qu.:4.000	1st Qu.:5.000	1st Qu.:6.00	1st Qu.:5.500
Median :6.000	Median :5.000	Median :6.000	Median :6.00	Median :6.000
Mean :6.138	Mean :5.036	Mean :5.818	Mean :6.19	Mean :6.217
3rd Qu.:7.000	3rd Qu.:6.000	3rd Qu.:6.750	3rd Qu.:7.00	3rd Qu.:7.000
Max. :7.000	Max. :7.000	Max. :7.000	Max. :7.00	Max. :7.000
NA's :14	NA's :15	NA's :21	NA's :22	NA's :20

important
Min.   :1.00
1st Qu.:4.00
Median :4.00
Mean   :4.64
3rd Qu.:6.00
Max.   :7.00
NA's   :18

interesting
Min.   :4.000
1st Qu.:5.000
Median :6.000
Mean   :5.818
3rd Qu.:7.000
Max.   :7.000
NA's   :21

large
Min.   :2.000
1st Qu.:4.000
Median :4.000
Mean   :4.375
3rd Qu.:5.000
Max.   :7.000
NA's   :19

long
Min.   :1.000
1st Qu.:4.000
Median :4.000
Mean   :3.964
3rd Qu.:4.000
Max.   :7.000
NA's   :15

lovely
Min.   :4.000
1st Qu.:6.000
Median :6.000
Mean   :6.207
3rd Qu.:7.000
Max.   :7.000
NA's   :14

lucrative
Min.   :3.000
1st Qu.:4.000
Median :5.000
Mean   :5.143
3rd Qu.:6.000
Max.   :7.000
NA's   :22

magical
Min.   :3.000
1st Qu.:6.000
Median :6.000
Mean   :6.067
3rd Qu.:7.000
Max.   :7.000
NA's   :13

positive
Min.   :5.000
1st Qu.:6.000
Median :7.000
Mean   :6.423
3rd Qu.:7.000
Max.   :7.000
NA's   :17

random
Min.   :1.000
1st Qu.:4.000
Median :4.000
Mean   :4.042
3rd Qu.:4.000
Max.   :7.000
NA's   :19

recent
Min.   :3.000
1st Qu.:4.000
Median :4.000
Mean   :4.129
3rd Qu.:4.000
Max.   :6.000
NA's   :12

sad
Min.   :1
1st Qu.:1
Median :2
Mean   :2
3rd Qu.:3
Max.   :3
NA's   :18

scandalous
Min.   :1.0
1st Qu.:2.0
Median :2.0
Mean   :2.5
3rd Qu.:3.0
Max.   :5.0
NA's   :21

scary
Min.   :1.000
1st Qu.:2.000
Median :2.000
Mean   :2.192
3rd Qu.:3.000
Max.   :4.000
NA's   :17

smooth
Min.   :4.000
1st Qu.:5.000
Median :5.000
Mean   :5.115
3rd Qu.:5.750
Max.   :7.000
NA's   :17

special
Min.   :4.000
1st Qu.:5.000
Median :6.000
Mean   :5.542
3rd Qu.:6.000
Max.   :7.000
NA's   :19

successful
Min.   :5.000
1st Qu.:6.000
Median :7.000
Mean   :6.517
3rd Qu.:7.000
Max.   :7.000
NA's   :14

surprising
Min.   :4.000
1st Qu.:4.000
Median :4.000
Mean   :4.609
3rd Qu.:5.000
Max.   :7.000
NA's   :20

unlikely
Min.   :1.000
1st Qu.:3.000
Median :3.000
Mean   :3.136
3rd Qu.:4.000
Max.   :4.000
NA's   :21

unusual
Min.   :1.000
1st Qu.:3.000
Median :4.000
Mean   :3.484
3rd Qu.:4.000
Max.   :5.000
NA's   :12

wonderful
Min.   :5.000
1st Qu.:6.000
Median :7.000
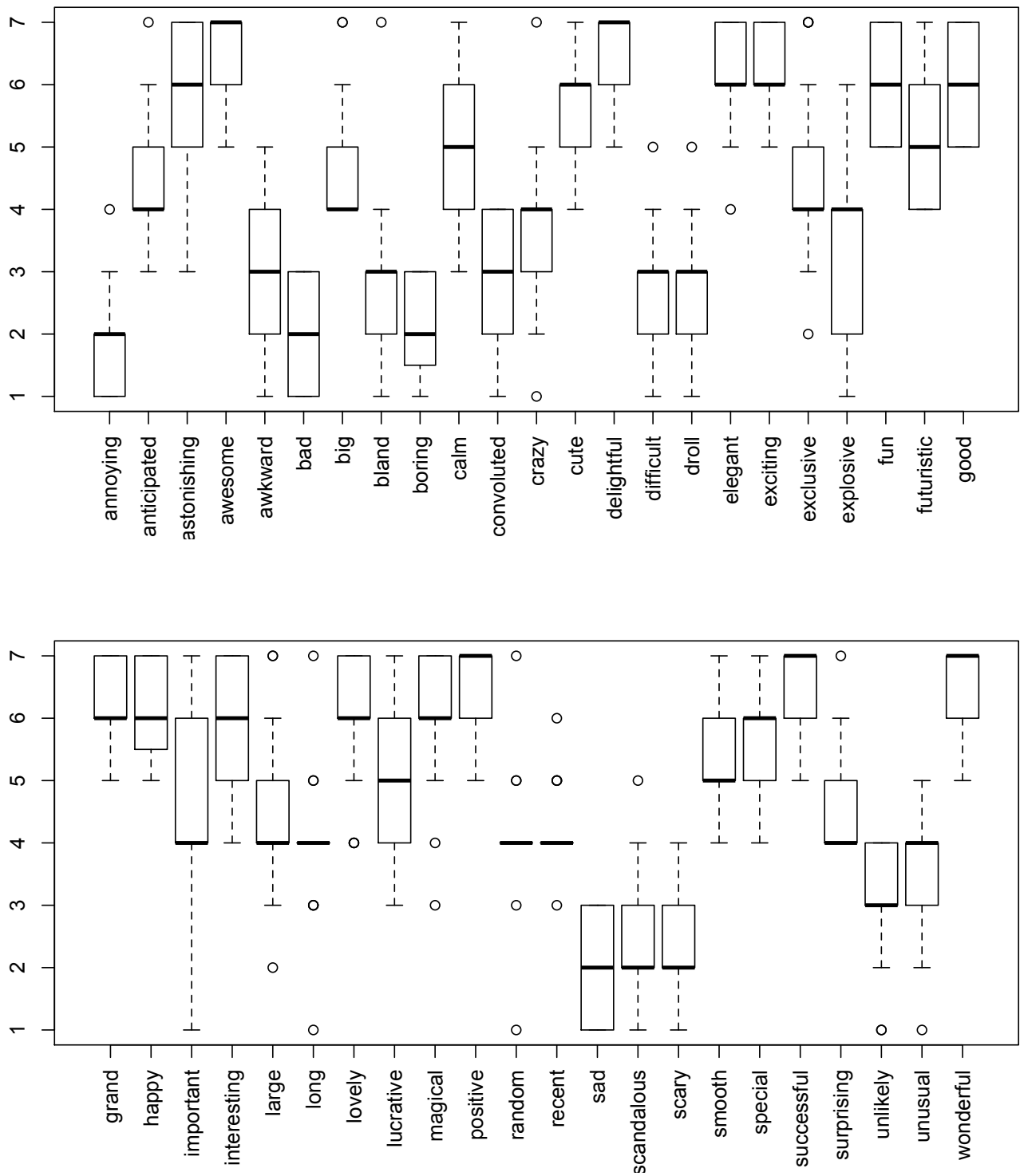Mean   :6.586
3rd Qu.:7.000
Max.   :7.000
NA's   :14

Figure 75: Boxplots for sentiment ratings for adjectives elicited with *make* sentence frame.

	Positive Score	Negative Score	Pos - Neg
abnormal	0.000	0.750	-0.750
absurd	0.375	0.000	0.375
adventurous	0.625	0.250	0.375
amazing	0.500	0.250	0.250
annoying	0.000	0.500	-0.500
awe-inspiring	0.875	0.125	0.750
awesome	0.875	0.125	0.750
awful	0.000	0.875	-0.875
awkward	0.000	0.750	-0.750
bad	0.000	0.625	-0.625
beautiful	0.750	0.000	0.750
big	0.250	0.125	0.125
bitter	0.000	0.500	-0.500
bizarre	0.000	0.250	-0.250
boring	0.000	0.250	-0.250
catastrophic	0.000	0.750	-0.750
consequential	0.125	0.000	0.125
convenient	0.625	0.250	0.375
cool	0.375	0.000	0.375
crazy	0.000	0.500	-0.500
creative	0.000	0.000	0.000
curious	0.125	0.375	-0.250
dangerous	0.000	0.750	-0.750
delightful	0.750	0.000	0.750
destructive	0.000	0.625	-0.625
detrimental	0.000	0.750	-0.750
disastrous	0.000	0.750	-0.750
disturbing	0.000	0.875	-0.875
dramatic	0.500	0.000	0.500
dumb	0.000	0.250	-0.250
exciting	0.375	0.000	0.375
exotic	0.000	0.000	0.000
explosive	0.250	0.500	-0.250
extraordinary	0.625	0.000	0.625
extravagant	0.125	0.375	-0.250
extreme	0.000	0.250	-0.250
fantastic	0.375	0.000	0.375
fascinating	0.500	0.000	0.500
fortuitous	0.250	0.375	-0.125
fortunate	0.750	0.000	0.750
frightening	0.000	0.625	-0.625
fun	0.375	0.000	0.375

	Positive Score	Negative Score	Pos - Neg
funny	0.500	0.000	0.500
generous	0.000	0.000	0.000
good	0.750	0.000	0.750
great	0.750	0.000	0.750
happy	0.875	0.000	0.875
hateful	0.333	0.667	-0.334
heinous	0.222	0.778	-0.556
helpful	0.250	0.000	0.250
horrible	0.000	0.625	-0.625
huge	0.000	0.125	-0.125
hurtful	0.000	0.500	-0.500
important	0.875	0.000	0.875
incredible	0.000	0.000	0.000
influential	0.125	0.000	0.125
innocent	0.625	0.250	0.375
inspiring	0.500	0.000	0.500
interesting	0.375	0.000	0.375
intriguing	0.500	0.000	0.500
kind	0.625	0.000	0.625
lame	0.125	0.375	-0.250
large	0.250	0.125	0.125
loud	0.375	0.125	0.250
lovely	0.625	0.000	0.625
meaningful	0.125	0.000	0.125
mischeivous	0.000	0.250	-0.250
natural	0.250	0.000	0.250
negative	0.000	0.875	-0.875
nice	0.875	0.000	0.875
normal	0.000	0.500	-0.500
novel	0.375	0.125	0.250
obnoxious	0.000	0.625	-0.625
odd	0.375	0.000	0.375
optimistic	0.500	0.250	0.250
outrageous	0.000	0.875	-0.875
peculiar	0.125	0.375	-0.250
perplexing	0.125	0.125	0.000
pleasant	0.625	0.125	0.500
popular	0.125	0.000	0.125
positive	0.625	0.000	0.625
rare	0.250	0.000	0.250
reasonable	0.500	0.000	0.500

	Positive Score	Negative Score	Pos - Neg
remarkable	0.250	0.250	0.000
ridiculous	0.000	0.625	-0.625
sad	0.125	0.750	-0.625
scary	0.000	0.750	-0.750
serious	0.125	0.000	0.125
shocking	0.375	0.125	0.250
significant	0.375	0.000	0.375
silly	0.000	0.375	-0.375
simple	0.125	0.375	-0.250
small	0.000	0.375	-0.375
special	0.000	0.000	0.000
spontaneous	0.250	0.000	0.250
strange	0.375	0.125	0.250
stressful	0.000	0.625	-0.625
substantial	0.000	0.000	0.000
surprising	0.000	0.625	-0.625
terrible	0.000	0.625	-0.625
terrifying	0.000	0.625	-0.625
tragic	0.000	0.625	-0.625
troubling	0.000	0.875	-0.875
ugly	0.000	0.375	-0.375
unexpected	0.125	0.375	-0.250
unfortunate	0.000	0.875	-0.875
unkind	0.500	0.375	0.125
unnatural	0.000	0.750	-0.750
unnecessary	0.250	0.250	0.000
unpleasing	0.500	0.250	0.250
unthinkable	0.000	0.625	-0.625
unusual	0.125	0.625	-0.500
upsetting	0.000	0.750	-0.750
weird	0.000	0.750	-0.750
wild	0.250	0.250	0.000
wonderful	0.750	0.000	0.750

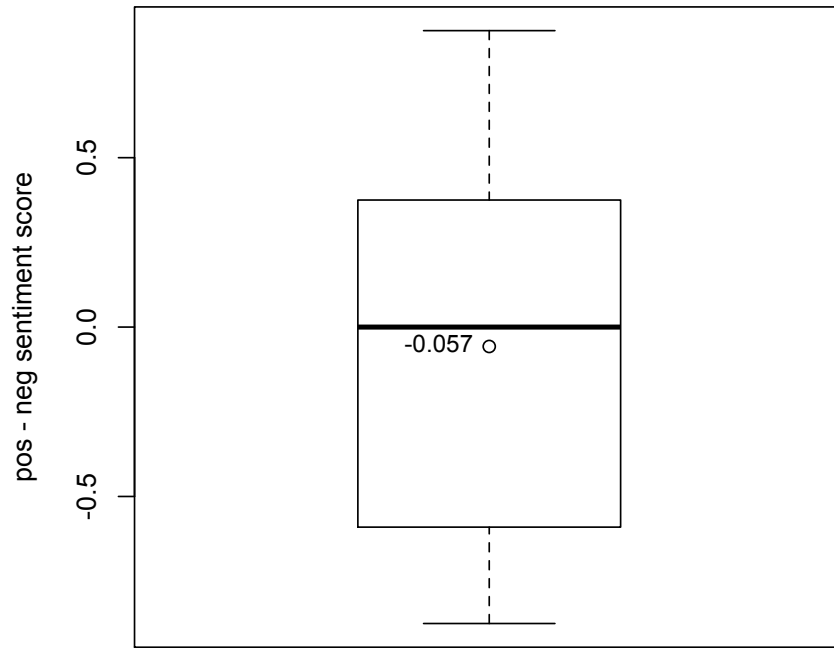Figure 76: SentiWordNet positive and negative sentiment scores, and their difference.

Figure 77: Box plot for single (positive-negative) SentiWordNet score, with mean.

Block 1:   Block 2:

bad	G	absurd	L	big	G	happy	G	small	G	weird	G
bad	G	amazing	G	big	G	happy	G	special	L	weird	G
bad	G	amazing	G	big	G	horrible	L	spontaneous	L	weird	G
banal	L	annoying	L	big	G	horrible	L	strange	L	weird	G
beneficial	L	awe-inspiring	G	bizarre	L	horrible	L	strange	L	weird	G
chaotic	L	awesome	G	catastrophic		horrible	L	strange	L	weird	G
crazy	G	awesome	G	cool	G	horrible	L	strange	L	wild	G
crucial	L	awful	G	cool	G	horrible	L	strange	L	wonderful	G
detailed	L	awful	G	crazy	G	huge	L	strange	L	wonderful	G
disasterous	L	awful	G	crazy	G	important	L	strange	L		
disasterous	L	awful	G	dangerous	L	influential	L	strange	L		
dreadful	G	awful	G	dangerous	L	influential	L	strange	L		
exciting	L	awkward	G	delightful	L	innocent	L	strange	L		
exciting	L	bad	G	destructive	L	interesting	L	strange	L		
exciting	L	bad	G	detrimental	L	interesting	L	strange	L		
exciting	L	bad	G	detrimental	L	interesting	L	strange	L		
extraordinary	L	bad	G	detrimental	L	interesting	L	stressful			
extreme	L	bad	G	disasterous	L	interesting	L	surprising	L		
fluid	L	bad	G	disastrous	L	interesting	L	surprising	L		
fun	G	bad	G	disturbing	L	interesting	L	surprising	L		
fun	G	bad	G	dramatic	L	interesting	L	surprising	L		
fun	G	bad	G	exciting	L	interesting	L	surprising	L		
horrible	L	bad	G	exciting	L	interesting	L	surprising	L		
important	L	bad	G	exciting	L	intriguing	L	surprising	L		
improbable	L	bad	G	exciting	L	lame	G	terrible	L		
interesting	L	bad	G	exciting	L	loud	G	terrible	L		
intriguing	L	bad	G	exciting	L	loud	G	terrible	L		
joyous	L	bad	G	exciting	L	meaningful	G	terrible	L		
late	G	bad	G	exciting	L	negative	L	terrible	L		
memorable	L	bad	G	exciting	L	normal	L	terrible	L		
memorable	L	bad	G	explosive	L	novel	L	terrible	L		
new	G	bad	G	extreme	L	odd	G	terrifying	L		
nice	L	bad	G	fantastic	L	odd	G	tragic	L		
painful	L	bad	G	fascinating	L	odd	G	troubling	L		
problematic	L	bad	G	fortuitous	L	odd	G	troubling	L		
random	L	bad	G	fortunate	L	odd	G	troubling	L		
recent	L	bad	G	frightening	G	optimistic	L	ugly	G		
same	G	bad	G	frightening	G	outrageous	L	unexpected	L		
same	G	bad	G	frightening	G	peculiar	L	unexpected	L		
scary	G	bad	G	fun	G	peculiar	L	unexpected	L		
scary	G	bad	G	funny	G	pleasant	L	unexpected	L		
serious	L	bad	G	funny	G	popular	L	unexpected	L		
short	G	bad	G	good	G	reasonable	L	unexpected	L		
small	G	bad	G	good	G	remarkable	L	unexpected	L		
somber	L	bad	G	good	G	sad	G	unexpected	L		
special	L	bad	G	good	G	sad	G	unfortunate	L		
strange	L	bad	G	good	G	sad	G	unfortunate	L		
strange	L	bad	G	good	G	sad	G	unfortunate	L		
successful	L	bad	G	good	G	sad	G	unfortunate	L		
surprising	L	bad	G	good	G	scary	G	unfortunate	L		
surprising	L	bad	G	good	G	scary	G	unkind	G		
terrible	L	bad	G	good	G	scary	G	unnatural	L		
terrible	L	bad	G	good	G	scary	G	unnecessary	L		
troublesome	L	bad	G	good	G	scary	G	unpleasing	L		
troubling	L	bad	G	good	G	scary	G	unthinkable	G		
unexpected	L	bad	G	good	G	scary	G	unusual	L		
unique	L	bad	G	good	G	serious	L	unusual	L		
unlikely	G	bad	G	great	G	shocking	G	unusual	L		
unusual	L	bad	G	great	G	silly	G	upsetting	G		
wild	G	beautiful	L	happy	G	simple	L	weird	G		

Figure 78: Word origins of elicited adjectives via OED. L = Latinate, G = Germanic.

3. Expanded Feature Hierarchy

The feature hierarchy that follows is an expanded version of that given in the conclusion. In Figure 79, the node for the manipulative causatives is elaborated in a hypothesized analogy with that of the directive causatives. It is suggested that the verb *drive* is a non-physical effectuating manipulative verb and is given the label "psychological" in line with its restriction to human causees as subjects in the [NP to-VP] non-finite complement clause pattern[125] and its selectional behavior as discussed in Chapter 3.

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[125] Thanks to Steve Wechsler for pointing out this restriction on complements of *drive.*
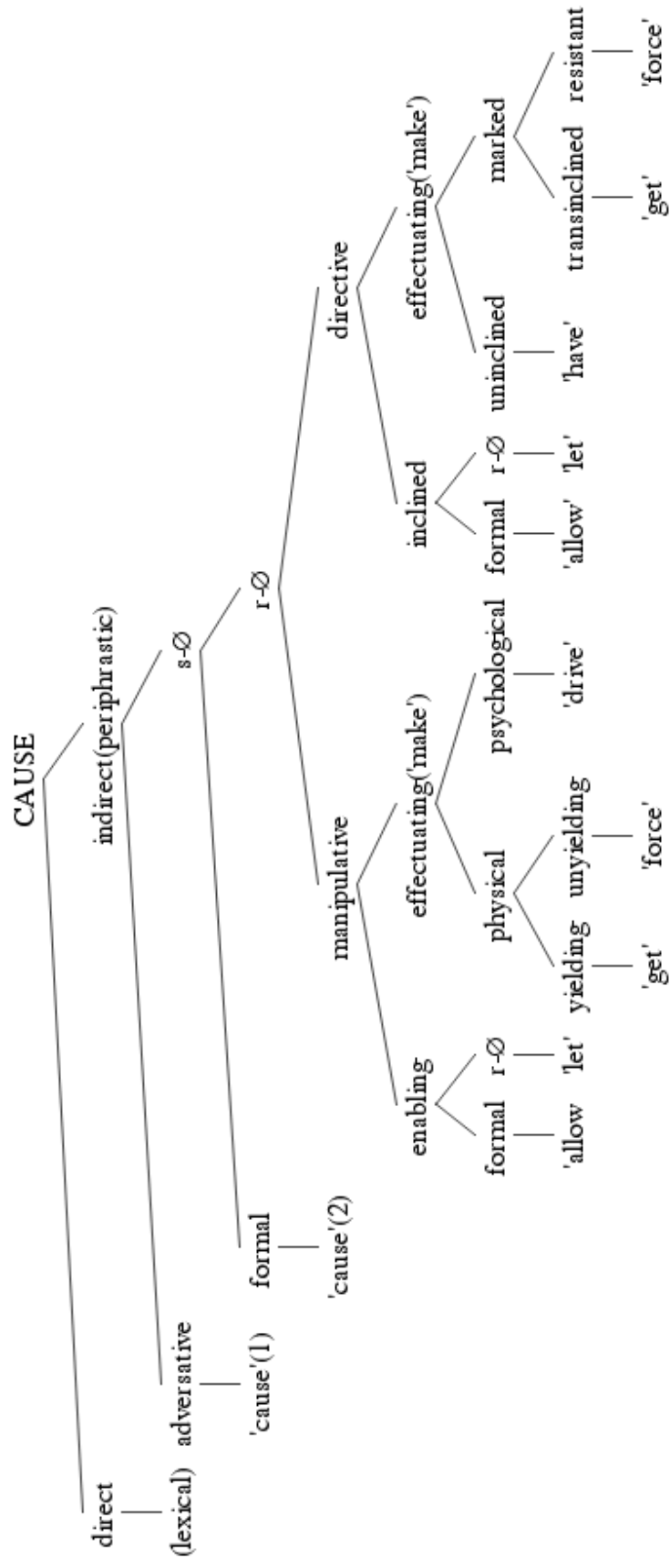
Figure 79: Expanded feature hierarchy of English periphrastic causatives, with hypothesized distinctions among the manipulative causatives and inclusion of *drive*.

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Bibliography

Alicke, M., Rose, D., & Bloom, D. (2011). Causation, Norm violation, and culpable control. *Journal of Philosophy*, *108*(12), 670–696.

Anscombe, G. E. M. (1975). Causality and Determinism. In *Causation and Conditionals* (ed. E. Sosa, pp. 63–81). Oxford: Oxford University Press.

Aquinas, T. (2012). *Summa theologica*. Milton Keynes: Authentic Media Inc.

Aristotle. (1941a). Metaphysics. In *The Basic Works of Aristotle, ed. Richard McKeon*. New York: Random House.

Aristotle. (1941b). Physics. In *The Basic Works of Aristotle, ed. Richard McKeon*. New York: Random House.

Austin, J. L. (1970). Ifs and Cans. In *Philosophical Papers* (ed. G. Warnock 2nd, pp. 205–232). London: Oxford University Press.

Babby, L. (1994). A theta-theoretic analysis of adversity impersonal sentences in Russian. In *FASL 2: The MIT Meeting* (pp. 25–67). Ann Arbor, MI: Michigan Slavic Publications.

Baccianella, S., Esuli, A., & Sebastiani, F. (2010). SentiWordNet 3.0: An Enhanced Lexical Resource for Sentiment Analysis and Opinion Mining. *LREC*, *10*, 2200–2204.

Baker, M. (1988). *Incorporation: a theory of grammatical function changing*. Chicago: University of Chicago Press.

Bar-Ilan, L., & Berman, R. A. (2007). Developing register differentiation: the Latinate-Germanic divide in English. *Linguistics*, *45*(1), 1–35.

Baron, N. S. (1972). *The evolution of English periphrastic causatives: contributions to a general theory of linguistic variation and change* (Doctoral dissertation). Committee on Linguistics.

Baron, N. S. (1977). *Language acquisition and historical change*. (Vol. 36). Amsterdam: North-Holland.

Beaver, D. I. (2001). *Presupposition and Assertion in Dynamic Semantics*. CSLI Publications, Stanford, CA.

Beavers, J., & Francez, I. (2006). Several problems for predicate decompositions. In *Proceedings of the Thirty-Second Meeting of the Berkeley Linguistics Society* (pp. 37–48). Citeseer. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.122.607&rep=rep1&type=pdf

Beavers, J. T. (2006). *Argument/oblique alternations and the structure of lexical meaning* (Doctoral dissertation). Stanford University.

Beck, S., & Snyder, W. (2001). The Resultative Parameter and Restitutive "again." In *Audiatur vox sapientiae: A festschrift for Arnim von Stechow* (eds C. Fe'ry and W. Sternefeld, Vol. 52, p. 48). Berlin: Akademie Verlag.

Beebee, H., Hitchcock, C., & Menzies, P. (2009). *The Oxford Handbook of Causation*. Oxford: Oxford University Press.

Blair-Goldensohn, S., Hannan, K., McDonald, R., Neylon, T., Reis, G. A., & Reynar, J. (2008). Building a sentiment summarizer for local service reviews (Vol. 14, pp. 339–348). Presented at the WWW Workshop on NLP in the Information Explosion Era.

Bloomfield, L. (1933). *Language*. Chicago: University of Chicago Press.

Bresnan, J. W. (1995). Lexicality and Argument Structure 1. Presented at the Paris Syntax and Semantics Conference.

Broadie, S. (2009). The Ancient Greeks. In *The Oxford Handbook of Causation* (eds H. Beebee, C. Hitchcock, P. Menzies, pp. 21–39). Oxford: Oxford University Press.

Carroll, J. W. (2009). Anti-Reductionism. In *The Oxford Handbook of Causation* (eds H. Beebee, C. Hitchcock, P. Menzies, pp. 279–298). Oxford: Oxford University Press.

Cheung, C. C.-H., & Larson, R. K. (2015). Psych verbs in English and Mandarin. *Natural Language & Linguistic Theory*, *33*(1), 127–189.

Chierchia, G., & McConnell-Ginet, S. (1990). *Meaning and Grammar*. Cambridge, MA: MIT press.

Childers, Z. (2013). *Selectional Preferences of Semantically Primitive Verbs in English: The periphrastic causatives and verbs of becoming* (MA Thesis). University of Texas at Austin.

Chomsky, N. (1972). Remarks on Nominalizations. In *Studies on Semantics in Generative Grammar* (pp. 11–61). The Hague: Mouton.

Clatterbaugh, K. (2009). The Early Moderns. In *The Oxford Handbook of Causation* (eds H. Beebee, C. Hitchcock, P. Menzies, pp. 55–72). Oxford: Oxford University Press.

Comrie, B. (1976). *Aspect: An introduction to the study of verbal aspect and related problems* (Vol. 2). Cambridge: Cambridge University Press.

Copley, B., & Harley, H. (2010). An ontology for a force-dynamic treatment of events. In *Forces in Grammatical Structures (to appear)* (eds B. Copley & F. Martin). Oxford: Oxford University Press.

Copley, B., & Harley, H. (2015). A force-theoretic framework for event structure. *Linguistics and Philosophy*, *38*(2), 103–158.

Copley, B., & Wolff, P. (2014). Theories of causation should inform linguistic theory and vice versa. In *Causation in grammatical structures* (eds B. Copley & F. Martin, pp. 11–57). Oxford: Oxford University Press.

Coppock, E. (2008). *The logical and empirical foundations of Baker's Paradox* (Doctoral dissertation). ProQuest.

Croft, W. (1990). Possible verbs and the structure of events. In *Meanings and prototypes: Studies in linguistic categorization* (ed. S. Tsohatzidis, pp. 48–73). Cambridge: Cambridge University Press.

Croft, W. (2010). *Verbs: Aspect and argument structure*. Oxford: Oxford University Press.

Culicover, P. W., & Dellert, J. (2008). Going postal: the architecture of English change of state verbs. (Unpublished Manuscript). Retrieved from ase.tufts.edu/cogstud /culicover.pdf

Davies, M. (2008). *The Corpus of Contemporary American English*. Retrieved from http:// corpus.byu.edu/coca/

Davis, A. R., & Koenig, J.-P. (2000). Linking as constraints on word classes in a hierarchical lexicon. *Language*, 56–91.

Davis, C., & Potts, C. (2010). Affective demonstratives and the division of pragmatic labor. In *Logic, Language and Meaning* (eds M. Aloni et al., pp. 42–52). Berlin Heidelberg: Springer.

DeLancey, S. (1984). Notes on agentivity and causation. *Studies in Language*, *8*(2), 181–213.

Descartes, R. (1985). *The Philosophical Writings of Descartes* (trans and ed J. Cottingham, R. Stoothoff, and D. Murdoch, Vol. i and ii). Cambridge: Cambridge university press.

Dictionary, O. E. (1989). *OED* (2nd ed.). Oxford: Oxford University Press.

Dowe, P. (2000). The conserved quantity theory defended. *Theoria: An International Journal for Theory, History and Foundations of Science*, 11–31.

Dowe, P. (2009). Causal Process Theories. In *The Oxford Handbook of Causation* (eds H. Beebee, C. Hitchcock, P. Menzies, pp. 213–233). Oxford: Oxford University Press.

Dowty, D. (1979). *Word Meaning and Montague Grammar: The Semantics of Verbs and Times in Generative Semantics and in Montague's PTQ*. Reidel: Dordrecht.

Dowty, D. (1991). Thematic proto-roles and argument selection. *Language*, 547–619.

Falcon, A. (2015). Aristotle on Causality. In *The Stanford Encyclopedia of Philosophy*. Edward N. Zalta (ed.). Retrieved from http://plato.stanford.edu/archives/spr2015 /entries/aristotle-causality/

Fillmore, C. J. (1970). The Grammar of Hitting and Breaking. In *Readings in English Transformational Grammar* (ed. R. Jacobs, pp. 120–133). Waltham, MA: Ginn.

Fodor, J. A. (1970). Three reasons for not deriving "kill" from "cause to die." *Linguistic Inquiry*, *1*(4), 429–438.

Gilquin, G. (2010). *Corpus, cognition and causative constructions* (Vol. 39). Amsterdam: John Benjamins Publishing.

Goddard, C. (2011). Causatives. In *Semantic analysis: A practical introduction*. Oxford: Oxford University Press.

Godfrey-Smith, P. (2009). Causal Pluralism. In *The Oxford Handbook of Causation* (eds H. Beebee, C. Hitchcock, P. Menzies, pp. 326–337). Oxford: Oxford University Press.

Goffman, E. (1959). *The Presentation of Self in Everyday Life*. New York: Anchor Books.

Good, I. J. (1961). A causal calculus (I). *The British Journal for the Philosophy of Science*, *11*(44), 305–318.

Gregory, M. (1967). Aspects of varieties differentiation. *Journal of Linguistics*, *3*(2), 177–198.

Grimshaw, J. (1990). *Argument Structure*. Cambridge, MA: the MIT Press.

Hall, N. (2000). Causation and the Price of Transitivity. *The Journal of Philosophy*, *97*(4), 198–222.

Hall, N. (2004). Two concepts of causation. In *Causation and Counterfactuals* (eds J. Collins, N. Hall & L.A. Paul, pp. 225–276). Cambridge, MA: MIT press.

Harley, H. (1995). *Subjects, Events and Licensing* (Doctoral dissertation). Massachusetts Institute of Technology.

Harley, H. (1996). sase bizarre: The Japanese causative and structural case. In *Proceedings of the 1995 Canadian Linguistics Society Meeting, University of Toronto Working Papers in Linguistics*.

Harris, J. A., & Potts, C. (2009). Perspective-shifting with appositives and expressives. *Linguistics and Philosophy*, *32*(6), 523–552.

Hatzivassiloglou, V., & McKeown, K. R. (1997). Predicting the semantic orientation of adjectives. In *Proceedings of the 35th annual meeting of the association for computational linguistics and eighth conference of the European chapter of the association for computational linguistics*.

Heim, I. (1991). Articles and definiteness. In *Semantics - An international handbook of contemporary research* (eds. A. von Stechow & D. Wunderlich). Berlin: De Gruyter.

Hobbes, T. (1839). Concerning Body. In *The English Works of Thomas Hobbes* (ed. W. Molesworth, Vol. 1). London: John Bohn.

Hobbes, T. (1900). *Leviathan: Or the Matter, Forme and Power of a Commonwealth, Ecclesiasticall and Civil* (Vol. 21). New Haven: Yale University Press.

Hollmann, W. (2006). Passivisability of English periphrastic causatives. *Trends in Linguistics Studies and Monographs*, *172*, 193ff.

Horn, L. R. (1972). On the Semantic Properties of the Logical Operators in English. Presented at the Indiana University Linguistics Club.

Horn, Laurence R. (2002). Assertoric inertia and NPI licensing. *CLS*, *38*(2), 55–82.

Hume, D. (1980a). *A Treatise of Human Nature* (2nd ed.). Oxford: Clarendon Press.

Hume, D. (1980b). *An Enquiry Concerning Human Understanding & A Letter from a Gentleman to his Friend in Edinburgh* (ed. Eric Steinberg). Indianapolis: Hackett Publishing Company.

Jackendoff, R. (1992). *Semantic Structures* (Vol. 18). Cambridge, MA: MIT press.

Jesperson, O. (1961). *A Modern English Grammar: On Historical Principles*. London: George Allen & Unwin Ltd.

Kant, I. (1977). *Prolegomena to any future metaphysics that will be able to come forward as science*. Upper Saddle River, NJ: Hackett.

Kaplan, D. (1999). *The meaning of ouch and oops: Explorations in the theory of meaning as use*. Manuscript, UCLA.

Karttunen, L. (1973). Presuppositions of Compound Sentences. *Linguistic Inquiry*, (4), 169–93.

Karttunen, L., & Peters, S. (1975). Conventional implicature in Montague grammar. In *Proceedings of the first annual meeting of the Berkeley Linguistics Society* (pp. 266–78).

Kennedy, A., & Inkpen, D. (2006). Sentiment classification of movie reviews using contextual valence shifters. *Computational Intelligence*, 22(2), 110–125.

Keyser, S. J., & Roeper, T. (1984). On the middle and ergative constructions in English. *Linguistic Inquiry*, 15(3), 381–416.

Kistler, M. (2014). Analyzing causation in light of intuitions, causal statements, and science. In *Causation in grammatical structures* (eds B. Copley & F. Martin, pp. 76–99). Oxford: Oxford University Press.

Koontz-Garboden, A. (2009). Anticausativization. *Natural Language & Linguistic Theory*, 27(1), 77–138.

Koontz-Garboden, A., & Beavers, J. (2009). Is there a manner/result complementarity in verbal roots? In *Roots: Word Formation from the Perspective of "Core Lexical Elements."* Universitat Stuttgart.

Lakoff, G. (1965). *On the nature of syntactic irregularity* (Doctoral dissertation).

Lakoff, G. (1968). Instrumental Adverbs and the Concept of Deep Structure. *Foundations of Language*, (4), 4–29.

Langacker, R. W. (1987). *Foundations of cognitive grammar: Theoretical prerequisites* (Vol. 1). Palo Alto, CA: Stanford University Press.

Lauer, S. (2010). *Periphrastic causative verbs in English: what do they mean?* Manuscript, Stanford University.

Lavine, J. E. (2010). Case and Events in Transitive Impersonals. *Journal of Slavic Linguistics*, 18(1), 101–130.

Letuchiy, A. (2012). Time reference in Russian causative constructions. *Oslo Studies in Language*, *4*(1).

Levin, B. (1993). *English verb classes and alternations: A preliminary investigation*. Chicago: University of Chicago Press.

Levin, B., & Rappaport Hovav, M. (1991). Wiping the slate clean: A lexical semantic exploration. *Cognition*, *41*(1), 123–151.

Levin, B., & Rappaport Hovav, M. (1995). *Unaccusativity: At the syntax-lexical semantics interface*. (Vol. 26). Cambridge, MA: MIT press.

Levinson, S. C. (1983). *Pragmatics*. Cambridge: Cambridge University Press.

Lewis, D. (1973). Causation. *The Journal of Philosophy*, *70*(17), 556–567.

Liskova, E. (2011). *Adversity Impersonals in Russian*. Unpublished manuscript.

Mackie, J. L. (1974). *The cement of the universe: A study of causation*. Oxford: Clarendon Press.

Mackie, John L. (1965). Causes and conditions. *American Philosophical Quarterly*, *2*(4), 245–264.

Malamud, S. A. (2012). Impersonal indexicals: one, you, man, and du. *Journal of Comparative German Linguistics*, *15*(1), 1–48.

Marenbon, J. (2009). The Medievals. In *The Oxford Handbook of Causation* (eds H. Beebee, C. Hitchcock, P. Menzies, pp. 40–54). Oxford: Oxford University Press.

McCawley, J. (1968). The role of semantics in a grammar. In *Universals in Linguistic Theory* (eds E. Bach & R.T. Harms, pp. 125–170). New York: Holt, Rinehart, and Winston.

McCawley, J. D. (1968). Lexical Insertion in a Transformational Grammar without Deep Structure (Vol. 4, pp. 71–80). Presented at the Chicago Linguistics Society.

McCawley, J. D. (1974). On Identifying the Remains of Deceased Clauses. In *Adverbs, Vowels, and Other Objects of Wonder* (pp. 84–95). Chicago: University of Chicago Press.

McCawley, James D. (1981). *Everything that Linguists have Always Wanted to Know about Logic but were ashamed to ask*. Chicago: University of Chicago Press.

Michel, J.-B., Shen, Y. K., Aiden, A. P., Veres, A., Gray, M. K., Brockman, W., … Aiden. (2011). Quantitative Analysis of Culture Using Millions of Digitized Books. *Science*, *331*(6014), 176–182.

Neeleman, A., & van de Koot, H. (2010). The Linguistic Expression of Causation. In *UCL Working Papers in Linguistics* (pp. 78–100).

Newton, I. (1953). *Newton's Philosophy of Nature: Selections from his Writings* (ed. H. S. Thayer). New York: Hafner.

Nietzsche, F. (1968). Beyond Good and Evil. In *Basic Writings of Nietzsche* (trans. and ed. Walter Kaufmann, pp. 181–438). New York: The Modern Library.

Oshima, D. Y. (2007a). On empathetic and logophoric binding. *Research on Language and Computation*, *5*(1), 19–35.

Oshima, D. Y. (2007b). Syntactic direction and obviation as empathy-based phenomena: A typological approach. *Linguistics*, *45*(4), 727–764.

Pang, B., & Lee, L. (2008). Opinion mining and sentiment analysis. *Foundations and Trends in Information Retrieval*, *2*(1-2), 1–135.

Pang, B., Lee, L., & Vaithyanathan, S. (2002). Thumbs up?: Sentiment classification using machine learning techniques. In *Proceedings of the ACL-02 conference on Empircal methods in natural language processing* (Vol. 10, pp. 79–86). Association for Computational Linguistics.

Pearl, J. (2009). *Causality*. Cambridge: Cambridge University Press.

Pearl, J., & Verma, T. (1995). A theory of inferred causation. *Studies in Logic and the Foundations of Mathematics*, *134*, 789–811.

Perlmutter, D., & Postal, P. (1984). The 1-advancement exclusiveness law. *Studies in Relational Grammar*, *2*(81), 125.

Piaget, J. (1930). *The child's conception of physical causality*. London: Kegan Paul.

Pinker, S. (1989). *Learnability and cognition: The acquisition of argument structure*. Cambridge, MA: MIT press.

Plato. (1966). Phaedo. In *Plato in Twelve Volumes* (translated by Harold North Fowler, Vol. 1). Cambridge, MA: Harvard University Press.

Potts, C. (2005). *The Logic of Conventional Implicatures*. Oxford: Oxford University Press.

Potts, C. (2007). The expressive dimension. *Theoretical Linguistics*, *33*(2), 165–198.

Potts, C., & Roeper, T. (2006). The narrowing acquisition path. In *The syntax of nonsententials: Multidisciplinary perspectives* (eds L. Progovac & K. Paesani, p. 183). Amsterdam: John Benjamins Publishing.

Psillos, S. (2009). Regularity Theories. In *The Oxford Handbook of Causation* (eds H. Beebee, C. Hitchcock, P. Menzies, pp. 131–157). Oxford: Oxford University Press.

Pylkkanen, L. (2002). *Introducing Arguments* (Doctoral dissertation). MIT Working Papers in Linguistics.

Rappaport Hovav, M., & Levin, B. (1998). Building verb meanings. In *The projection of arguments: Lexical and compositional factors* (eds M. Butt & W. Geuder, pp. 97–134). Cambridge: Cambridge University Press.

Reichenbach, H. (1956). *The Direction of Time*. Berkeley: University of California Press.

Royster, J. F. (1922). Old English causative verbs. *Studies in Philology*, *19*(3), 328–356.

Russell, B. (1948). *Human knowledge: Its scope and its limits*. New York: Simon & Schuster.

Russell, B. (1984). *Theory of knowledge: The 1913 manuscript* (Vol. 7). London: Routledge.

Salmon, W. (1984). *Scientific explanation and the causal structure of the world*. Princeton: Princeton University Press.

Salmon, W. C. (1980). Probabilistic Causality. *Pacific Philosophical Quarterly*, *61*, 137–153.

Searle, J. R. (1998). *Mind, Language and Society*. New York: Perseus Books Group.

Shibatani, M. (1976). The Grammar of Causative Constructions: A Conspectus. In *The grammar of causative constructions* (ed. M. Shibatani). Cambridge, MA: Academic Press.

Shibatani, M., & Pardeshi, P. (2002). The causative continuum, *Typological studies in language*(48), 85–126.

Simons, M., Tonhauser, J., Beaver, D., & Roberts, C. (2010). What projects and why. In *Proceeding of SALT 20* (pp. 309–327).

Sosa, E. (1975). *Causation and Conditionals*. Oxford: Oxford University Press.

Stalnaker, R. C. (1968). A theory of conditionals. In *Ifs* (pp. 41–55). Netherlands: Springer.

Steinbock, B., & Norcross, A. (1994). *Killing and letting die*. New York: Fordham University Press.

Suppes, P. (1970). *A probabilistic theory of causality*. Amsterdam: North-Holland Publishing Company.

Sweeton, J., & Deerrose, B. (2010). Causal Attributions: A Review of the Past and Directions for the Future. *The New School Psychology Bulletin*, *7*(1), 31–41.

Talmy, L. (1976). Semantic causative types. *Syntax and Semantics*, *6*, 43–116.

Talmy, L. (1988). Force dynamics in language and cognition. *Cognitive Science*, *12*(1), 49–100.

Talmy, L. (2000). *Toward a cognitive semantics* (Vol. 1). Cambridge, MA: MIT press.

Tonhauser, J., Beaver, D., Roberts, C., & Simons, M. (2013). Toward a taxonomy of projective content. *Language*, *89*(1), 66–109.

Van Valin, R. D., & Wilkins, D. (1996). The case for "effector": Case roles, agents, and agency revisited. In *Grammatical constructions: Their form and meaning* (eds S. Thompson & M. Shibatani, pp. 289–322). Oxford: Oxford University Press.

Von Fintel, K. (2000). What is Presupposition Accomodation? (Unpublished Manuscript). Retrieved from http://web.mit.edu/fintel/www/accomm.pdf

Wechsler, S. (1995). *The semantic basis of argument structure* (Doctoral dissertation). Center for the Study of Language and Information.

Wechsler, S. (1997). Resultative predicates and control. In *Proceedings of the 1997 Texas Linguistics Society Conference* (pp. 307–321). University of Texas at Austin.

Wechsler, S. (2005). What is Right and Wrong About Little v. In *Grammar and Beyond - Essays in honour of Lars Hellan* (eds M. Dimitrova-Vulchanova & T.A. Afarli, pp. 179–195). Oslo: Novus Press.

Wechsler, S. (2008). Dualist Syntax. In *Proceedings of the HPSG08 Conference NICT*. Keihanna Japan: CSLI Publications.

Weiner, B. (1974). *Achievement motivation and attribution theory*. New York: General Learning Press.

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review*, *92*(4), 548ff.

Weiner, B. (2010). The development of an attribution-based theory of motivation: A history of ideas. *Educational Psychologist*, *45*(1), 28–36.

Weiner, B., Russell, D., & Lerman, D. (1978). Affective consequences of causal ascriptions. *New Directions in Attribution Research*, *2*, 59–90.

Wierzbicka, A. (1998). The semantics of English causative constructions in a universal-typological perspective. In *The new psychology of language: Cognitive and functional approaches to language structure* (ed. M. Tomasello, Vol. 1, pp. 113–153). New York: Psychology Press.

Williamson, J. (2009). Probabilistic Theories. In *The Oxford Handbook of Causation* (eds H. Beebee, C. Hitchcock, P. Menzies, pp. 185–212). Oxford: Oxford University Press.

Wilson, D., & Carston, R. (2007). A Unitary Approach to Lexical Pragmatics: Relevance, Inference and Ad Hoc Concepts. In *Pragmatics* (ed. N. Burton-Roberts, pp. 230–259). London: Palgrave.

Wilson, F. (2016). John Stuart Mill. In *The Stanford Encyclopedia of Philosophy*. Edward N. Zalta (ed.). Retrieved from http://plato.stanford.edu/archives/spr2016/entries/mill/

Wittgenstein, L. (1960). *The Blue and Brown Books: Preliminary studies for the "Philosophical Investigations."* New York: Harper & Row.

Wittgenstein, L. (1994). *Tractatus Logico-Philosophicus* (trans. D. F. Pears and B. F. McGuinness). London: Routledge.

Wolff, P. (2007). Representing causation. *Journal of Experimental Psychology: General*, *136*(1), 82ff.

Wolff, P., & Song, G. (2003). Models of causation and the semantics of causal verbs. *Cognitive Psychology*, *47*(3), 276–332.

Woodward, J. F. (2009). Agency and Interventionist Theories. In *The Oxford Handbook of Causation* (eds H. Beebee, C. Hitchcock, P. Menzies, pp. 234–262). Oxford: Oxford University Press.

Wright, S. (2002). Transitivity and change of state verbs. In *Proceedings of the 28th Annual Meeting of the Berkeley Linguistics Society BLS* (pp. 339–350). Berkeley, CA: Berkeley Linguistics Society.

Zobel, S. (2011). *On the impersonal use of German personal pronouns*. Unpublished manuscript.