Blocking effects in English causatives[1]

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This paper presents a previously unobserved pattern of *morphological blocking* in English causatives, which parallels a well-studied pattern of morphological blocking in Japanese causatives (Shibatani, 1973, a.o.). We present evidence of deep parallels between the English and Japanese causatives along with a detailed syntax/semantics for these structures within the framework of Distributed Morphology. We argue that the blocking effect is sensitive not to *structural* adjacency, as previously argued for Japanese (Harley, 2008), but instead to *linear* adjacency. Our findings constitute a strong argument for the post-syntactic resolution of derivational morphology, *pace* Distributed Morphology and *contra* the Lexicalist Hypothesis. In particular, the sensitivity to linear adjacency shows that the operations relevant to the blocking effect must occur post-linearization, and therefore contributes to our understanding of the timing of post-syntactic operations.

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1   Introduction

A well-studied phenomenon in Japanese grammar is that of the *-sase* causative construction (Kuroda, 1965; Shibatani, 1973; Miyagawa, 1984, 1998; Jacobsen, 1992; Koizumi, 1995; Watanabe, 1993; Kuroda, 1993; Manning et al., 1999, a.o.). In her 2008 survey article, Harley (2008) describes the importance of this construction for modern linguistics: according to her, the morphological and syntactic processes related to the *-sase* causative construction have received more attention and inspired more theoretical proposals in linguistics than almost any other linguistic construction. In particular, much of the above-mentioned literature discusses Japanese causatives as a case study in the limits of the Universal Grammar hypothesis, due to fundamental differences between Japanese and English in their causative constructions and, in particular, the blocking behavior claimed to exist in Japanese but not English.

In this paper we present new data on English causatives which leads us to reject this premise that Japanese and English causatives differ from each other drastically. We argue instead that causatives in English and Japanese share deep syntactic and semantic parallels, and that English

causatives exhibit the same kind of blocking effect found in Japanese. We present a detailed syntax/semantics for English causatives within the framework of Distributed Morphology, building on previous work on Japanese causatives (Harley, 2008; Miyagawa, 1998, 2010) and on the analysis of blocking effects in Embick and Marantz (2008). We show that the blocking effect in English causatives is sensitive not to *structural* adjacency, as has been previously argued for Japanese, but instead to *linear* adjacency. Such a rule has been proposed, but not argued for in depth, in Embick and Marantz (2008). We show that the pattern of blocking effects we discover can only be accounted for via a process sensitive to linear adjacency. Our findings constitute a strong argument for the post-syntactic resolution of derivational morphology, as in the Distributed Morphology (DM) framework and unlike in the Lexicalist Hypothesis. In particular, the sensitivity to linear adjacency shows that the operations relevant to such blocking effects (in our DM-based proposal, the processes of Fusion and Vocabulary Insertion) must occur post-linearization, and therefore contributes to our understanding of the timing of post-syntactic operations.

The remainder of this paper is structured as follows. In section 2 we outline some basics of DM, in particular as they relate to blocking effects. We then briefly introduce the novel pattern of blocking effects in English *lexical* and *analytic* (*make*) causatives that will concern us in the paper. In section 3 we present our analysis for the English causatives and show how it captures the data. In section 4 we relate our proposal to notions of *direct* and *indirect* causation and discuss the status of traces in our theory. An appendix to the paper provides additional data and details of a grammaticality survey we used to ground the behavior of English causatives reported here.

2 Background and data

2.1 Blocking effects in Distributed Morphology

In some cases, we can imagine the same syntactic structure being realized through different morphophonological forms. *Morphological blocking effects* are cases where one specific form "blocks" the use of another, which could be hypothesized to exist based on regular word-formation rules. For example, the "irregular" past tense verb form *gave* blocks the otherwise expected form **gived*, derived by application of the past tense suffix *-ed* to the verb, as in e.g. *walked* and *cooked*. Similarly, Aronoff (1976) proposes that the simple form *glory* blocks the rule-derived **gloriosity*. That is, the lexically-specified form blocks the regular word-formation rule (affix *-ity*) that is responsible for creating words such as *responsibility*, *curiosity*, and *stability* from applying in this case.

Much previous work, including Aronoff's (1976) original description of the phenomenon, assumes that blocking effects involve *competition* between simpler and more complex forms, with the simple form winning over the more complex one. Within DM, on the other hand, blocking involves the interaction of stored information about morphemes and regular word-formation rules.

Under this approach, illicit forms such as *gived* and *gloriosity* cannot ever be generated.[2]

We now briefly introduce basic notions of DM that will be used in our discussion below and outline how blocking effects are treated within DM. DM is a syntactic approach to word-formation, where many morphological operations happen at PF, including *late insertion* of phonological material into terminal nodes. Terminals in the syntactic representation—which can be roots, abstract feature bundles, or combinations thereof—receive a phonological realization in the PF component through a process of Vocabulary Insertion. As an example from Embick and Marantz (2008), consider the Vocabulary Items in (1), which are possible ways of spelling out the past tense node T[PAST] in English. When multiple rules can apply, the most highly specified rule is employed.

(1) **Vocabulary items for past tense (T[PAST]):**

    a. T[PAST] $\leftrightarrow$ *-t* / $\{\sqrt{\text{LEAVE}}, \sqrt{\text{BEND}}, ...\}$ ___

    b. T[PAST] $\leftrightarrow$ $\emptyset$ / $\{\sqrt{\text{HIT}}, \sqrt{\text{QUIT}}, ...\}$ ___

    c. T[PAST] $\leftrightarrow$ *-ed*

What we observe as "blocking" is a result of the fact that Vocabulary Insertion can apply only once for each terminal node. For example, the terminal T[PAST] will have just one realization depending on its environment: either *-t*, *-ed*, or $\emptyset$. Thus, when *-t* appears as T[PAST] in the context of the root $\sqrt{\text{BEND}}$, it appears to "block" the realization of the same exponent with *-ed*.

Furthermore, under this view, blocking relationships only exist between alternate realizations of individual terminal nodes, not between words. That is, *bent* does not block **bended*. Rather, the ungrammatical forms—for example, **bended* and **gived*—are never generated and are never considered during the derivation of the grammatical forms, e.g. *bent* and *gave*.

The choice of which Vocabulary Item to use at a certain terminal is based on which one matches the most features of that node, and does not contain extraneous features not present at the node itself. That is, Vocabulary Insertion is guided by the *Subset Principle* (Halle, 1997), which states that the Vocabulary Item that realizes the maximal subset of morphosyntactic features on the terminal is the one chosen for Insertion.[3]

This approach can also explain patterns of so-called *Poser blocking*, where words and phrases participate in a blocking paradigm (Poser, 1992). The pattern of blocking in English causatives that we will discuss in this paper is such a case, where forms like *bounced* and *made...bounce* participate in a blocking paradigm. A well-known case of Poser blocking is that of comparative (and superlative) suppletion, where adjectives that are spelled out as just one syllable are affixed with *-er*, and otherwise the comparative morphology is spelled out as *more*. This is illustrated in (2) below. In each

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[2]See Embick and Marantz (2008) for a detailed theory of blocking within DM and a critical review of competition-based approaches to this phenomenon.

[3]This proposal is based on the notion of the "elsewhere" principle in phonology (**?**), although the core idea goes back as early as Pāṇini's grammar of Sanskrit.

case, only one form is possible and the other form is ungrammatical, and this which comparative form is used is fully predicted from an adjective's size.

(2) **Blocking in comparatives (Poser, 1992):**

    a. ✓smarter, *more smart

    b. *intelligenter, ✓more intelligent

As discussed in Poser (1992), such cases of blocking between words and phrases present a problem for competition-based approaches; however, within DM they are handled exactly the same as simpler cases of blocking. In particular, this type of blocking pattern is argued to result from the generalization that Rules Apply, (3).[4]

(3) **Rules Apply (Embick and Marantz, 2008):**
Perform a computation when the structural description of the rule is met.

Following Rules Apply, if there is a rule of affixation that applies in a particular structural context, it must apply, and the alternative realization will not be generated. The pattern in (2a) does not reflect a general preference of words over phrases, but rather it is created because phonological and morphophonological rules apply obligatorily when they can, resulting in *smarter* instead of **more smart*.

2.2 Blocking effects in causatives

We now briefly introduce the novel pattern of blocking in English causatives that will be the center of this paper. This pattern is similar to a widely discussed blocking effect in Japanese causatives (Kuroda, 1965; Shibatani, 1973; Miyagawa, 1984, 1998; Jacobsen, 1992; Koizumi, 1995; Watanabe, 1993; Kuroda, 1993; Manning et al., 1999, a.o.).

The blocking effect that we observe for English, and which has been observed previously for Japanese, crucially relies on controlling for the semantics introduced by the causative form. Causative forms can encode one of two different semantic relations. One is *causation*, where the (primarily physical) actions of the subject bring about the described state of affairs. The other is what we term "*compulsion*," where the subject puts the causee under an obligation.[5] Note that the semantics of compulsion, but not causation, requires that the causee be an animate and volitional agent (cf Shibatani 1973 for Japanese, among many others).

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[4]This principle extends to all forms of blocking; see Embick and Marantz (2008).

[5]Note that this distinction is different than the well-known cases of *direct causation* and *indirect causation* discussed e.g. in McCawley (1978). We will discuss this distinction and its relation to our proposal in section 4.1.
This distinction is also different from what Shibatani (1973) describes as "coercive." Coercive causatives imply that the causee is unwilling to do the coerced action, but that is not necessarily the case for English *make*. See also **?** for discussion.

We will first introduce the basic Japanese blocking pattern. Japanese has a productive causative suffix, *-(s)ase*, but some verbs additionally have their own, lexically listed causative form. We follow the above literature in calling the productive causative forms *analytic*, as opposed to the lexically-specified *lexical* causative forms. For verbs that have these two causative forms, the two semantically different types of causatives correspond to the choice of causative verb form. Here we will demonstrate this relationship using the root *narab-*, 'line up.' (Examples (5–6) come from Sachiko Kato, Masatoshi Koizumi, and Daichi Yasunaga, p.c.)

(4) **Two causative forms for *narab-* 'line up':**

    a. *lexical*: narab-**e**-

    b. *analytic*: narab-**ase**-

(5) **Lexical causative form = causation semantics:**
Kyooshi-ga kaado-o kyootaku-ni narab-*{e/*ase}*-ta.
teacher-**NOM** card-**ACC** teacher's desk-on line up-**CAUSE-PAST**
'The teacher arranged the cards on the teacher's desk.'

Example (5) shows a lexical causative with a causation meaning. A compulsion meaning is impossible here as the causee is inanimate. The unavailability of the *-(s)ase* analytic causative in (5) has been described as a case of morphological blocking (Miyagawa, 1980; Zenno, 1985): the existence of the lexical form *narabeta* blocks the analytic form *narabaseta* from taking a causation meaning.

(6) **Analytic causative form = compulsion semantics:**
Kyooshi-ga seito-o kootei-ni narab-*{#e/ase}*-ta.
teacher-**NOM** student-**ACC** schoolyard-in line up-**CAUSE-PAST**
'The teacher made students line up in the schoolyard.'

In example (6), only a compulsion causative is available. The use of the lexical causative form (*narabeta*) in this example forces a *causation* reading, where the animate causee ("students") is being physically moved, and is therefore judged by native speakers as degraded.

Now we will introduce the novel pattern of blocking in English causatives. In this paper we study causatives of English verbs that have both a *lexical* causative form (a lexically-specified, zero-derived form) and an *analytic* (*make...verb*) causative form.[6] One such verb is *bounce*:

(7) **Lexical and analytic causative forms in English:**

    a. The coach *bounced* the ball on the floor.   *lexical causative*

    b. The coach *made* the ball *bounce* on the floor.   *analytic causative*

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[6]In this paper we will only discuss *make* analytic causatives, and not *get, let, cause...to*, etc., as our argument is based on the novel blocking pattern that we present between lexical and *make* analytic causative forms.

While both causative forms in (7) are grammatical, when an inanimate *causee*—'the ball' in (7–8)—is moved from its canonical position, we find that the lexical causative "blocks" the analytic causative:

(8)   **With inanimate causee moved, analytic causative form is degraded (cf (7); (5) in Japanese):**

    a.   That's the ball that the coach *bounced* ___ on the floor.   *lexical causative*

    b. *That's the ball that the coach *made* ___ *bounce* on the floor.   *analytic causative*

Note that the ungrammaticality we find by using a cleft construction in (8b) can be replicated by other means of extracting the causee out of the way. In (9) we demonstrate this effect using an object relative clause, heavy NP shift, and a *wh*-question.

(9)   **Effect in (8) is not limited to clefts:**

    a. *The ball that the coach *made* ___ *bounce* on the floor was bright red.

    b. *The coach *made* ___ *bounce* on the floor [the bright red ball that my mother gave me for Christmas last year].

    c. *Which ball did the coach *made* ___ *bounce* on the floor?

The property shared by all these structures is the creation of *linear adjacency* between *make* and the verb. Throughout this paper we will illustrate this environment using clefts to move the causee from its canonical position.

Like in the case of the Japanese causatives, English lexical causatives only have a causation reading, not a compulsion reading. They thus sound odd with animate causees, (10).

(10)   **With animate causee moved, lexical causative form is degraded (cf (6) in Japanese):**

    a. # That's the gymnast that the coach *bounced* ___ on the floor.   *lexical causative*

    b. That's the gymnast that the coach *made* ___ *bounce* on the floor.   *analytic causative*

Note that unlike the blocking effect in (8), the oddness detected in (10) does not require the causee to be moved out of the way: (11), parallel to the baseline in (7) but with an animate causee, yields the same pattern of judgments as when the causee has been moved out of the way:

(11)   **With animate causee, lexical causative form is generally degraded:**

    a. # The coach *bounced* the gymnast on the floor.   *lexical causative*

    b. The coach *made* the gymnast *bounce* on the floor.   *analytic causative*

The results of a grammaticality survey we have conducted show that, with the causee moved out of its canonical position as in (8, 10), lexical causatives with inanimate causees and analytic causatives with animate causees are judged as natural, while lexical causatives with animate causees and analytic causatives with inanimate causees are judged as degraded. These findings are summarized in the table below (see also Figure 1). Details of the survey are presented in the appendix.
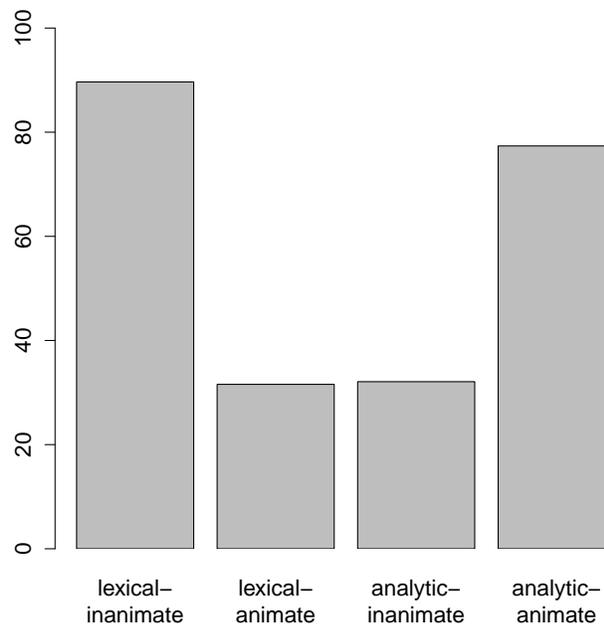
Figure 1: Average ratings for causatives with moved causees

(12)

Condition	Rating
lexical-inanimate	0.896
lexical-animate	0.316
analytic-inanimate	0.321
analytic-animate	0.774

To summarize, although the canonical word-order of English causatives has served to mask this fact and led many researchers to believe that English and Japanese causatives are fundamentally different with regard to this blocking behavior, we note that the English pattern in (8, 10), with the causee moved out of the way, is parallel to the well-studied Japanese pattern in (5, 6). Importantly, the pattern observed in English causatives—in particular, with its sensitivity to the position of the causee—constitutes an argument for the blocking effect being sensitive to *linear* adjacency, instead of to *structural* adjacency as has been argued for Japanese (Harley, 2008, a.o.). We will argue that this constitutes a strong argument for the post-syntactic resolution of derivational morphology, as in the Distributed Morphology framework and unlike in the Lexicalist Hypothesis. In particular, the sensitivity of the blocking effect to linear adjacency shows that the relevant processes must occur post-linearization, at PF, where traces of phrasal movement do not intervene.

3 An analysis of English causatives

In this section we present our analysis of English lexical and analytic (*make*) causatives. The paradigm that we set out to explain is repeated below in (13–14):

(13) **English causatives with in-situ causees:**

    a.   The coach *bounced* the ball on the floor.   *lexical-inanimate*

    b. # The coach *bounced* the gymnast on the floor.   *lexical-animate*

    c.   The coach *made* the ball *bounce* on the floor.   *analytic-inanimate*

    d.   The coach *made* the gymnast *bounce* on the floor.   *analytic-animate*

(14) **English causatives with moved causees:**

    a.   That's the ball that the coach *bounced* ___ on the floor.   *lexical-inanimate*

    b. # That's the gymnast that the coach *bounced* ___ on the floor.   *lexical-animate*

    c. *That's the ball that the coach *made* ___ *bounce* on the floor.   *analytic-inanimate*

    d.   That's the gymnast that the coach *made* ___ *bounce* on the floor.   *analytic-animate*

In particular, we must explain why structures with a lexical causative form and an inanimate causee, and structures with an analytic causative form and an animate causee, are grammatical across the board; structures with a lexical causative form and an animate causee are semantically deviant but grammatical; and structures with an analytic causative form and an inanimate causee are ungrammatical only when *make* and the verb are linearly adjacent as in (14c) but not (13c).
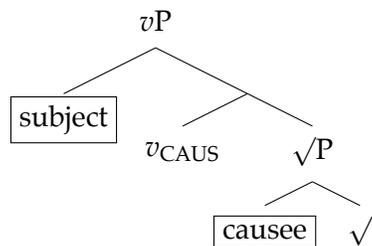
3.1 Proposal

The analysis we propose is based on Harley's (2008) analysis of Japanese causatives but with one important difference: the morphological blocking effect observed with English causatives must be sensitive to *linear* adjacency, not *structural* adjacency as in Harley's analysis of Japanese causatives. We will first spell out our analysis and show how it captures the English data in (13–14) and then discuss the consequences of this analysis for the theory of morphology. In the next subsection we will give evidence to support this view for English and—borrowing from Harley (2008) and references therein—for Japanese as well.

Following Hale and Keyser (1993) and specifically the analysis for Japanese causatives in Harley (2008) and Miyagawa (2010), we propose that English lexical and analytic causatives can be built from two different structures, with $v_{\mathbf{CAUSE}}$ taking a $\sqrt{\mathrm{P}}$ complement or a $v\mathrm{P}$ complement (see also
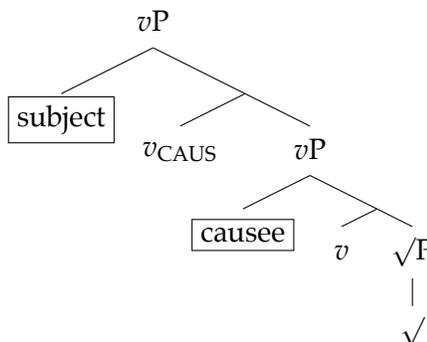
Pylkkänen, 2002; Blanco, 2010).[7] These options are illustrated here in (15a–b).[8]

(15) **Two different causatives, with different embedding sizes:**

   a. $\sqrt{}$P embedding:

```
              vP
           ╱     ╲
      ┌─────────┐
      │ subject │
      └─────────┘   ╱    ╲
                 v_CAUS    √P
                         ╱    ╲
                   ┌────────┐
                   │ causee │   √
                   └────────┘
```

   b. *v*P embedding:

```
              vP
           ╱     ╲
      ┌─────────┐
      │ subject │
      └─────────┘   ╱     ╲
                 v_CAUS     vP
                          ╱    ╲
                    ┌────────┐
                    │ causee │   ╱  ╲
                    └────────┘  v    √P
                                      │
                                      √
```

The two different structures in (15) correspond one-to-one with the two possible meanings of English causatives. The first causative structure (15a), involving a smaller embedding which Harley (2008) calls "mono-clausal," always yields a *causation* meaning. As such, this structure is not restricted in terms of the kind of causee it may take, although animate causees might be judged as odd in this structure because the resulting semantics requires a direct action on the animate causee (in our examples, bouncing a gymnast). The second causative structure (15b), involving a "bi-clausal" structure in Harley's (2008) terms, always yields a *compulsion* meaning, i.e. putting the causee under an obligation. Due to its semantics, the compulsion causative is only compatible with *animate* and volitional causees, because only these causees can be placed under some kind of obligation—that is, one can require of a gymnast to bounce, but not of a ball.

For verbs which have a lexical causative form, the lexical causative form realizes both $v_{\textbf{CAUSE}}$ and $\sqrt{}$ together. This option is limited to the $\sqrt{}$P-embedding structure in (15a). An analytic causative form, on the other hand, can realize both a $\sqrt{}$P-embedding structure (15a) and a *v*P-embedding structure, (15b). Under what conditions the $\sqrt{}$P-embedding structure is realized as the lexical causative and under what conditions it is realized as the analytic causative will be discussed in detail below. The properties of the two causative structures are summarized in (16).

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[7] The label *v*P is used here to indicate a structure that contains a subject position—VoiceP in the terms of Pylkkänen (2002); Blanco (2010). See Blanco (2010) and our arguments in the proposal section for the necessity of a subject position inside analytic causatives.

[8] Here and throughout, we illustrate the causee in Spec,$\sqrt{}$P for $\sqrt{}$P-embedding causatives and Spec,*v*P for *v*P-embedding causatives, in order to yield the correct linear position for the causee, preceding the lexical verb in analytic *make...verb* forms. An operation moving the complement of V to its specifier has been independently proposed for Spec,VP (corresponding to Spec,$\sqrt{}$P here) by Johnson (1991) for Case licensing reasons, and is also assumed in Hale and Keyser's (1993) discussion of causatives. For the *v*P-embedding causative, the subject may be base-generated in this position (e.g. subjects of transitive and unergative *v*Ps) or moved there (Blanco, 2010). Evidence for the causee in *v*P-embedding causatives but not $\sqrt{}$P-embedding causatives being in a subject position (Spec,*v*P) will be presented in section 3.2.

(16) **Properties of the two causative structures, for both English and Japanese:**
for verbs that have a lexical causative form

a. <u>$v_{\textbf{CAUSE}}$ takes a $\sqrt{}$P (15a):</u>

- "mono-clausal"

- Causation meaning

- No animacy restriction, but animate causees might sound funny.

- English: realized as lexical **or** analytic (*make*) form

- Japanese: realized as lexical form

b. <u>$v_{\textbf{CAUSE}}$ takes a vP (15b):</u>

- "bi-clausal"

- Compulsion meaning

- Only animate/volitional causees

- English: realized as analytic (*make*) form

- Japanese: realized as analytic (-*sase*) form

Based on the properties summarized in (16), we can already explain one portion of the facts in (13–14): the deviance of examples such as (13b, 14b), with a lexical causative form and animate causee, are explained under this analysis. Because the lexical causative form is used, the causative structure employed must have been the $\sqrt{}$P-embedding structure, and therefore must have *causation* semantics. The oddness of these examples thus results from this combination of causation semantics and our world knowledge: (physically) bouncing of a gymnast is indeed odd.

Since the effect on these (b) examples comes from this semantic incongruity, it is unsurprising that some examples with a lexical causative and animate causee can sound perfectly natural, if the context supports the direct action affecting the cause. Example (17) uses the same predicate that participated in the deviant paradigm (13–14), bounce, showing that this effect is not one of grammaticality but instead of semantic deviance that is malleable to changes in the context.[9] Furthermore, in all of the examples, the naturalness of the example remains the same regardless of whether or not the causee is moved out of the way.

(17) a. The mother *bounced* the child on the trampoline.

b. That's the child that the mother *bounced* on the trampoline.

(18) a. The police *scattered* the crowd using fire hoses.

b. That's the crowd that the police *scattered* using fire hoses.

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[9]An analytic causative form is also possible with these examples, and has the expected compulsion interpretation:

(i) a. The mother *made* the child *bounce* on the trampoline.

b. That's the child that the mother *made* ___ *bounce* on the trampoline.

(19) a. The police *hid* the witness during the trial.

b. That's the witness that the police *hid* during the trial.

Of particular importance for the analysis of blocking effects in causatives is the operation of *Fusion*, defined as in (20). We propose that Fusion applies to the structure *at PF, after linearization*, and is thus sensitive to *linear adjacency* rather than syntactic structure (21). As standardly assumed, traces of movement are deleted at PF (Ross, 1967; Chomsky, 1993, and much subsequent work). As a result, traces do not intervene in the calculation of adjacency. Following the generalization that Rules Apply, Fusion must occur if its locality condition (21) is met and if there is a Vocabulary Item that can realize the targets of Fusion as a single terminal.[10,11] If no such Vocabulary Item exists, Fusion will not apply.

(20) **Fusion, based on Halle and Marantz (1993):**

A post-syntactic operation that takes two terminal nodes and fuses them into one terminal. Only one Vocabulary Item may be inserted, and it must have a subset of the morphosyntactic features of the fused node, including the features from both input terminal nodes.

(21) **Locality condition on Fusion:**

Fusion requires *linear adjacency*. Fusion cannot skip a linearly intervening terminal. Traces do not intervene at PF.

In the case of *causation* causatives (15a), Fusion applies to $v_{\textbf{CAUSE}}$ and $\sqrt{}$, resulting in the lexically-specified causative form of the verb (Halle and Marantz, 1993, a.o.). More precisely, Fusion will occur only if there is a Vocabulary Insertion rule that can realize $v_{\textbf{CAUSE}}+\sqrt{}$ together—i.e., when the verb has a lexically specified causative form. If no such lexical item exists, Fusion will not apply.[12] In the case of *compulsion* causatives (15b), on the other hand, Fusion can never apply because $v_{\textbf{CAUSE}}$ and $\sqrt{}$ are never linearly adjacent. Instead, they are always separated by an additional v which,

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[10]See also related work on "M(orphological)-Merger" (Marantz, 1984, 1988; Matushansky, 2006) and "Spanning" (Svenonius, 2012). What is crucial for our purposes is that the operation that applies—in our implementation of the theory, Fusion—require the relevant terminals to be spelled out as *using one Vocabulary Insertion step* or else not apply at all, if there is no lexical form that expresses the features of both terminals. A similar implementation is implicitly assumed in Miyagawa (1998), although the operation is not formally defined there.

[11]The notion of Fusion that we employ here is similar to the notion of Local Dislocation Merger, as in Embick and Noyer (2001). Local Dislocation Merger is a form of merger that happens post-linearization and is sensitive to linear order, not syntactic structure. This notion must be altered to require the single Vocabulary Insertion step as we explained above, making it essentially identical to the operation we defined in the text, or else we would have to specify Vocabulary Items that realize ∅ for the causative morpheme in the context of all verbs that have a causative alternation, and *make* for all other verbs. There are at least two open issues that must be addressed before this alternative can be adopted. The first is the use of the null morpheme as the marked case instead of the elsewhere case in the rule; the other is the question of how tense and other verbal inflection finds its way down from the null $v_{\textbf{CAUSE}}$ to be spelled out on the lexical verb, particularly as our analysis crucially cannot require obligatory applications of head-movement (see discussion below in section 3.5). We will leave these questions open here.

[12]English has been argued to lack lexical causatives of unergative and transitive verbs. We discuss this in section **??**. In addition, not all unaccusative verbs in English have a zero-derived lexical causative counterpart. For example, **John arrived Mary* is ungrammatical, with an intended interpretation similar to *John made Mary arrive*.

although realized as a null morpheme, is nonetheless an intervening terminal and target for Vocabulary Insertion, blocking Fusion of $v_{\textbf{CAUSE}}$ and $\sqrt{}$.[13] Consequently, compulsion causatives are always spelled out using the analytic causative form *make...verb* and never with a lexical causative form. We argue that this proposal derives the full paradigm in (13–14).[14]

3.2 Evidence for two different structures

Before discussing the blocking effect paradigm (13–14) in more detail, we will present the evidence which shows that the two types of causatives—causation and compulsion—are associated with two different structures. Many of the diagnostics we present here are modeled on similar contrasts observed between lexical and analytic causatives in the Japanese literature, and also borrow from previous work on English, in particular Fodor (1970).

The idea that analytic causatives have a larger or more complex structure than those involving a single verb encoding the causative is not new. Fodor (1970) famously observed that the verb *kill* behaves differently from *cause to die* under certain diagnostics of deep structure. For example, consider the contrast in (22) below, reproduced from Fodor (1970). While (22b) has a natural (but unfortunate) reading where Bill has swallowed his own tongue, the only reading (22a) could possibly have is a nonsensical one where John has swallowed Bill's tongue. Fodor proposed that the implicit subject of a manner adjunct (represented by PRO below) must have a "deep subject" antecedent. Fodor argues that the difference in grammaticality between (22a) and (22b) shows that the deep structure of the verbs in these examples is markedly different. In particular, the causee "Bill" in (22a) is not a "deep subject" of the verb *kill*, but it is a "deep subject" of *cause of die* in (22b).

(22) **Manner adjunct interpretation with *kill* vs. *cause to die* (Fodor, 1970):**

　a.　# John$_i$ *killed* Bill$_j$ by PRO$_{i/*j}$ swallowing his tongue.

　b.　 John$_i$ *caused* Bill$_j$ *to die* by PRO$_{i/j}$ swallowing his tongue.

---

[13]One might consider the recursive application of Fusion, whereby $v_{\textbf{CAUSE}}+v+\sqrt{}$ would together be targeted for Vocabulary Insertion. The English lexicon does not contain any Vocabulary Items that can realize all the features of these three heads combined, and hence Fusion will never apply to this structure. The same also holds for Japanese (Harley, 2008). We leave open the question of whether this is a cross-linguistic generalization, although we suspect that it is.

[14]Harley's (2008) logic developed for Japanese causatives is very similar to what is presented here, but implements a *structural* locality condition. In Harley's (2008) terms, the lexical causative must be used instead of the analytic causative if there is no syntactic layer separating $\sqrt{}$ from $v_{\textbf{CAUSE}}$ and there is a morphological rule specifying a lexical causative for a given verb. Hence, causatives with lexically-specified forms will be used in the $\sqrt{}$P-embedding causative construction (15a), but never in the vP-embedding construction (15b) because $v_{\textbf{CAUSE}}$ and $\sqrt{}$ are always separated by a second v. If no lexically-specified form of a particular verb is found, the analytic causative form will be used in the vP-embedding structure. This formulation ties the ability to realize a lexical causative to a *structural* locality condition, which cannot capture the English facts we have presented above, since, as we have seen, the English pattern is sensitive to the linear word order.

Pylkkänen (2002, pp. 99–100), citing Miyagawa (1998), also describes $v_{\textbf{CAUSE}}$ being realized as a lexical causative form or an analytic causative form depending on whether it is in a "local relation" with the root, but does not specify the nature of this locality relation.

This example from Fodor (1970) was presented as a response to the contemporaneous proposal from Generative Semantics that, for example, *kill* is derived from a decomposed deep structure representation similar to *cause to die* or *cause to become not alive* (Lakoff, 1965, a.o.). Note that the same contrast is observed with verbs whose lexical causative form is not suppletive, between their lexical and *make* analytic causative forms.[15] In example (23), the causee is moved to ensure that the lexical causative form (23a) is a causation causative, and the analytic causative form (23b) is a compulsion causative. Example (23b) has a natural reading, where the gymnast uses the pole to balance, as was instructed by the coach. In example (23a), however, the only possible reading involves the coach using a pole in some way in order to balance a gymnast.

(23) **Manner adjunct with lexical and analytic causatives:**

    a. That's the gymnast$_j$ that the coach$_i$ *balanced* ___ PRO$_{i/*j}$ using a pole.   *lexical*

    b. That's the gymnast$_j$ that the coach$_i$ *made* ___ *balance* PRO$_{i/j}$ using a pole.   *analytic*

Although our proposal here does not have a direct analog of the notion of deep subjects, we can think of it as corresponding to our Spec,vP position. Under our proposal, the analytic causative in (23b) is derived from a vP embedding under v_{CAUSE} and therefore having a Spec,vP position for the causee to occupy (see footnote 8). The lexical causative in (23a), however, is derived from a $\sqrt{}$P embedding under v_{CAUSE}, which does not host the causee in a Spec,vP position. As a result, we expect the causee to lack any "subject"-like status in lexical causatives.

A similar contrast has been observed in Japanese, and has been presented as an argument for the structural distinction between lexical and analytic causatives. In this case, the subject-based diagnostic relies on the distribution of readings with the anaphor *jibun*. *Jibun* is famously subject-oriented, needing to be bound by a subject, as we see in examples (24–25) below. In the mono-clausal (24), *jibun* may only refer to the subject Hanako. In the bi-clausal (25), however, *jibun* can refer to either Hanako or Jiro, leading to ambiguity (cf Kuroda 1965; Kuno 1973; examples from Miyagawa 2012).

(24) Hanako$_i$-ga Jiro$_j$-o jibun$_{i/*j}$-no uchi-de mi-ta.
      Hanako-NOM Jiro-ACC self-GEN   house-at see-PAST
      'Hanako saw Jiro at her/*his house.'

---

[15]Example (22) compares *killed* to a *cause to* causative. See Blanco (2010) for arguments that the *cause to* analytic causative takes a much larger embedding than the lexical and *make* analytic causatives considered here. Furthermore, in this paper we focus on English verbs whose lexical causative is a zero-derived form, rather than on verbs which could potentially be analyzed as having a suppletive lexical causative form (*kill* from *make die*, *drop* from *make fall*, *give* from *make have*, etc.). Here we will leave open the question of whether the novel blocking pattern observed—and therefore our analysis for different causative structures and their morphological realizations—extends to such cases.

(25) Hanako$_i$-ga   [Jiro$_j$-ga jibun$_{i/j}$-o mi-ta-to]   omo-tta.
    Hanako-**NOM** Jiro-**NOM** self-**ACC**   see-**PAST-COMP** think-**PAST**
    'Hanako thought that Jiro saw her/himself.'

Now consider the two causative forms. The lexical, causation causative in (26a) only allows binding by the subject but not by the causee. The analytic (-*sase*) compulsion causative in (26b), on the other hand, is ambiguous, allowing for *jibun* to be interpreted as the subject or the causee. The following examples are from Shibatani (1973).

(26) a. Taro$_i$-ga   Hanako$_j$-ni jibun$_{i/*j}$-no fuku-o   ki-*se*-ta.   *lexical*
        Taro-**NOM** Hanako-**DAT** self-**GEN**   clothes-**ACC** wear-**CAUSE-PAST**
        'Taro$_i$ dressed Hanako$_j$ in his$_i$/*her$_j$ own clothes.'

     b. Taro$_i$-ga   Hanako$_j$-ni jibun$_{i/j}$-no fuku-o   ki-*sase*-ta.   *analytic*
        Taro-**NOM** Hanako-**DAT** self-**GEN**   clothes-**ACC** wear-**CAUSE-PAST**
        'Taro$_i$ made Hanako$_j$ put on his$_i$/her$_j$ own clothes.'

Binding facts with the subject-oriented reflexive *jibun* suggest that the structure associated with a causation causative is smaller than that associated with a compulsion causative. Specifically, the difference in (26a–b) lies in whether or not the causee, Hanako, counts as a "subject" for the purposes of the subject-oriented reflexive. Again, if this subjecthood property is tied to the Spec,*v*P position, this difference in binding is explained by the analysis for Japanese causatives in Harley (2008) and Miyagawa (2010), which we have extended here to English.

Next consider event quantification by time adverbials. In example (27), the time adverbials *twice*, *repeatedly*, and *for 2 minutes* are added to parallel lexical and analytic causatives. Because the causee has been moved out of the way, the lexical causative (27a) must be interpreted with causation semantics, and the analytic causative (27b) must have a compulsion interpretation. Note that the addition of each of these adjuncts introduces an ambiguity in the compulsion comparative (27b), but not in the causation comparative (27a). The adjuncts can only modify the entire causation event in the causation causative (27a), but they can be interpreted as modifying either the compulsion event or the bouncing event in the compulsion causative (27b).

(27) **Temporal adjuncts in lexical and analytic causatives:**

     a. That's the gymnast that the coach *bounced* ___ {twice, repeatedly, for 2 minutes}.
        unambiguous   *lexical*

     b. That's the gymnast that the coach *made* ___ *bounce* {twice, repeatedly, for 2 minutes}.
        ambiguous   *analytic*

14

Shibatani (1973) demonstrates a similar ambiguity in Japanese. The addition of the adjunct *san-kai* 'three times' creates ambiguity when used with a compulsion *-sase* causative, but not with a causation causative.[16]

(28) a. Taro-ga   Hanako-o   heya-ni san-kai   *ire*-ta.   *lexical*
          Taro-**NOM** Hanako-**ACC** room-to three-times enter.**CAUS-PAST**
          unambiguous: 'Taro put Hanako into the room three times.'

      b. Taro-ga   Hanako-o   heya-ni san-kai   hair-*ase*-ta.   *analytic*
          Taro-**NOM** Hanako-**ACC** room-to three-times enter-**CAUSE-PAST**
          ambiguous: 'Taro made Hanako enter the room three times.'

Example (28a), with a causation causative, is unambiguous: there were three separate events of Taro putting Hanako into the room. Example (28b), with a compulsion causative, is ambiguous: it can either mean that Taro's making Hanako enter the room took place three times or that there was just one instance of Taro making Hanako do something, but that Taro instructed Hanako to enter the room three times.

We observe the same contrast with subject-oriented adverbs as well. One such adverb is *calmly*, a "mental-attitude" adverb in Ernst's (2002) classification. In the lexical causative (29a), *calmly* can describe only the mental state of the subject of the causative (the robber), but in an analytic causative in (29b), it can describe either the subject of the compulsion event (the robber) or the causee (the hostage), which is the subject of the embedded sitting event:

(29) **Subject-oriented adverb in lexical and analytic causatives:**

      a. That's the hostage that the robber *sat* ___ on the ground calmly.   *lexical*
          unambiguous: the robber was calm.

      b. That's the hostage that the robber *made* ___ *sit* on the ground calmly.   *analytic*
          ambiguous: the robber was calm or the hostage was calm.

As in the Japanese case, the facts presented here suggest that the compulsion causative contains more structure than the causation causative, including a subject-like position. We have adopted in our theory the $\sqrt{}$P-embedding and *v*P-embedding structures for the causation and compulsion causatives, respectively, as proposed in recent work on Japanese causatives (Harley, 2008; Miyagawa, 2010). We hence predict that the analytic causatives, but not the lexical causatives, have a subject-like position for the causee, explaining the facts we have seen above.
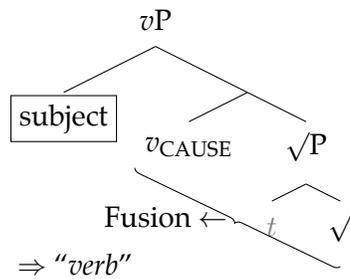
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[16]The example we reproduce here from Shibatani (1973), (28), uses the root *hair-*, whose lexical causative form is the suppletive *ire-*, rather than a lexically-listed causative affix attached to the root *hair-*. The same contrast holds with lexical causatives that do not use a suppletive form.

3.3 Causatives explained: the case of moved causees

We first discuss the examples in which the causee has been moved out of the way, (14). We begin with a causation causative—that is, $v_{\textbf{CAUSE}}$ taking a $\sqrt{}$P complement. Once the causee has been moved out of the way (represented in the trees below by t) we have the linearization "$v_{\textbf{CAUSE}}$ $t_{\textbf{CAUSEE}}$ $\sqrt{}$" at PF. Since traces do not intervene (21), $v_{\textbf{CAUSE}}$ and $\sqrt{}$ are possible candidates for Fusion. If there is a lexical causative form of the verb that can be inserted and realize all the features of the complex $v_{\textbf{CAUSE}}+\sqrt{}$, then Fusion *must* happen (Rules Apply), resulting in the structure in (30a). If no such form exists, Fusion cannot take place and instead two separate Vocabulary Insertions will happen: the *verb* will be inserted for $\sqrt{}$, and *make* will be inserted for $v_{\textbf{CAUSE}}$, (30b). In both cases, the resulting semantic interpretation of the structure is one of causation, regardless of whether the pronounced string is *verb* or *make verb*.

(30) **Derivation for causation causatives with moved causee:**
   a.   if the verb has a lexical causative: b.   otherwise:
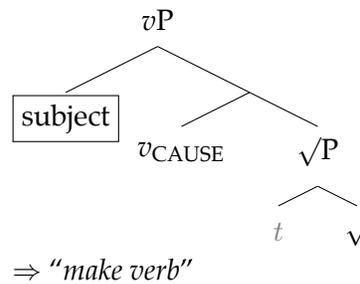
Next we consider a compulsion causative—that is, $v_{\textbf{CAUSE}}$ taking a vP complement. Recall the locality condition on Fusion (21): although traces do not interfere with Fusion, null heads do block it. Consequently, this $v_{\textbf{CAUSE}}$ and $\sqrt{}$ are not possible candidates for Fusion. Instead, they are necessarily linearized through two separate steps of Vocabulary Insertion: the *verb* will be inserted for $\sqrt{}$, and *make* will be inserted for $v_{\textbf{CAUSE}}$, (31). A null morpheme will be inserted to spell out v. The resulting semantic interpretation of this structure is one of compulsion and thus it requires the causee to be animate/volitional.

(31) **Derivation for compulsion causative with moved causee:**
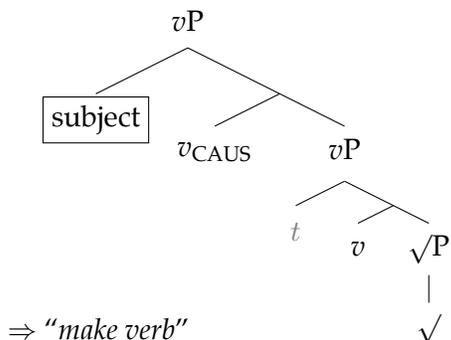
We thus have an account of the paradigm in (14), repeated here for convenience as (32). As we have shown, the compulsion causative is necessarily spelled out using the *make...verb* form, since Fusion can never apply to yield the lexical causative form of the verb. On the other hand, in the causation causative, since in this paradigm the causee is moved out of the way, the verb is linearly adjacent to the causative morpheme. Here, Fusion must apply whenever the verb has a lexically-specified form in the lexicon so the $v_{\textbf{CAUSE}}+\sqrt{}$ complex will be spelled out as *verb*.[17]

(32) a. That's the ball that the coach *bounced* ___ on the floor.   *lexical-inanimate*

b. # That's the gymnast that the coach *bounced* ___ on the floor.   *lexical-animate*

c. *That's the ball that the coach *made* ___ *bounce* on the floor.   *analytic-inanimate*

d. That's the gymnast that the coach *made* ___ *bounce* on the floor.   *analytic-animate*

Example (32a) is a well-formed causation causative where $v_{\textbf{CAUSE}}$ and *bounce* have fused and are pronounced as the lexical causative *bounced*. Example (32b) similarly contains the lexical causative form *bounced*, indicating that we are dealing with a $\sqrt{}$P-embedding structure, and therefore a causation causative, but in this case the causee is animate, leading to oddness because the semantics of the sentence requires that the coach physically bounce the gymnast. Examples (32c–d) contain the sequence *made bounce*. This sequence is necessarily the realization of the larger, vP-embedding structure because otherwise we expect Fusion to apply and the spell-out to contain the lexical causative form *bounced*. In (32d) we have an animate causee and the structure can receive a felicitous, compulsion interpretation. Example (32c), on the other hand, does not have a convergent derivation. Since it contains an inanimate causee, this structure is not compatible with a compulsion causative. On the other hand, if this is a causation causative then $\sqrt{}$ and $v_{\textbf{CAUSE}}$ are linearly adjacent but have failed to undergo Fusion. Our system does not produce *make bounce* as the causation causative of the verb *bounce*: this form is instead "blocked" by the form *bounced* as in (32a).

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[17]We note that, in fact, our theory predicts that any linearly intervening material between $v_{\textbf{CAUSE}}$ and $\sqrt{}$ in the causation causative structure should facilitate the spell-out of *make...verb* for the causation causative. This should be so even if the causee has been moved out of the way but, e.g., an adverb occurs between *make* and the *verb*. We believe that this is indeed the case, but the relevant contrasts seem to be less crisp than other judgments that we have presented in this paper. We leave open the question of why that is the case, but we note that speakers do observe a contrast between sentences with *linearly* intervening adverbs (id) and *structurally* intervening adverbs which are linearized after the verb (ib,c): the former are judged as better than the latter.

(i) a. *That's the ball that John *made roll*.

b. *That's the ball that John *made roll* on the floor.

c. *That's the ball that John *made roll* quietly on the floor.

d. That's the ball that John *made* quietly *roll* on the floor.

3.4 Causatives explained: the case of in-situ causees

We have thus shown that, when the causee is moved out of the way, verbs with lexically-specified causative forms yield a one-to-one correspondence between meaning and form, just as is generally the case in Japanese. However, recall that matters are more complicated if the causee is in-situ, as shown in (33). Here, the causee is always intervening between the verb and $v_{\textbf{CAUSE}}$, and we lose the one-to-one correspondence between the meaning and the form of the causative.

(33) a. The coach *made* the ball *bounce* on the floor. $^\checkmark$causation, *compulsion

     b. The coach *made* the gymnast *bounce* on the floor. $^\checkmark$causation, $^\checkmark$compulsion

To explain this, we will again consider the two types of causative structures (15) in turn. We begin with a causation causative, where $v_{\textbf{CAUSE}}$ embeds a $\sqrt{}$P. Here, we propose that the verb may optionally head-move to $v_{\textbf{CAUSE}}$, if and only if $v_{\textbf{CAUSE}}+\sqrt{}$ can be Fused into one target—that is, if there is a Vocabulary Item that can realize the result.[18] As a consequence, for verbs with a lexically specified form, a causation causative can be formed in one of two ways, (34a–b). $v_{\textbf{CAUSE}}+\sqrt{}$ in (34a) will be spelled out using one Vocabulary Insertion step, with the lexically specified form of the causative verb spelling out the entire verbal complex. In (34b), $\sqrt{}$ and $v_{\textbf{CAUSE}}$ are not linearly adjacent and hence must be spelled out using two Vocabulary Insertion steps, one for the verb and another realizing $v_{\textbf{CAUSE}}$ as *make*. For verbs that do not have a lexically-specified form, the derivation in (34a) is impossible because there is no single Vocabulary Insertion step that can spell out $v_{\textbf{CAUSE}}+\sqrt{}$.[19] Therefore whether a verb has a lexical causative must be a lexically-listed, learned property of individual roots. Instead, all these verbs are assigned a structure as in (34b), with *make* and the verb each spelled out separately.
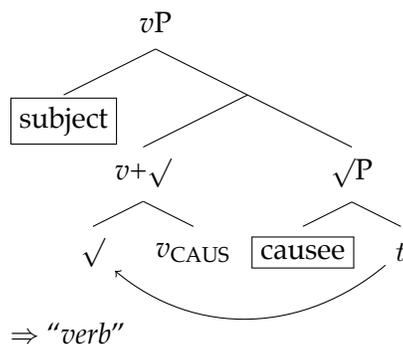
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[18]It is important for our purposes that morphological processes such as Fusion are subject to Rules Apply (3) but that head-movement, as a core syntactic operation, is *not* subject to Rules Apply.

This optionality allows for two contrasting outputs that differ in the number of Vocabulary Insertion steps that they involve. See the discussion in section 3.5 for the importance of this optionality in deriving the full English paradigm. Therefore our proposal also acts as an argument against alternative conceptions of blocking phenomena driven by a general, highly-ranked *Minimize Exponence* constraint on outputs (Siddiqi, 2006, 2009).
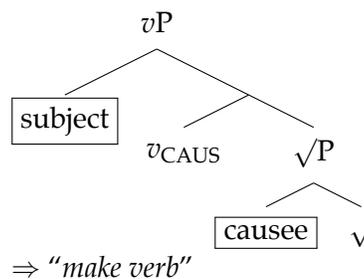
[19]Hence, a verb with a zero-derived lexical causative counterpart such as *bounce* can be spelled out as *bounce* or as *make...bounce*, but a verb that lacks a lexical causative form, such as *arrive*, will always be spelled out as *make...arrive*.

(34) **Derivations for causation causatives with in-situ causee:**
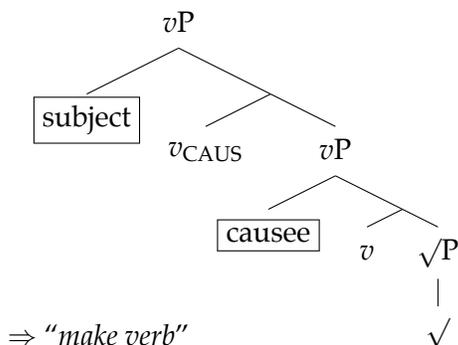
    a. <u>with head-movement:</u>   b. <u>without head-movement:</u>

$\Rightarrow$ *"verb"* $\Rightarrow$ *"make verb"*

Next consider compulsion causatives, (35). In this case, the intervening v makes it impossible for Fusion to apply to $v_{\textbf{CAUSE}}$ and $\sqrt{}$ in this structure. Instead, $\sqrt{}$ is always spelled out as the *verb* and $v_{\textbf{CAUSE}}$ is always spelled out as *make*.

(35) **Derivation for compulsion causative with in-situ causee:**

$\Rightarrow$ *"make verb"*

We thus have an account of the paradigm in (13), repeated here for convenience in (36). Examples (36a–b) contain the lexical form *bounced*, indicating that $v_{\textbf{CAUSE}}$ and $\sqrt{}$ must have been linearly adjacent via head-movement of $\sqrt{}$ to $v_{\textbf{CAUSE}}$ and Fused together in the derivation. (36a) is hence is well-formed causation causative, but in (36b) we have a causation causative with an animate causee, leading to oddness because the semantics of the sentence requires that the coach physically bounce the gymnast. Examples (36c–d) contain the string *make...verb*, which could have two distinct sources: either a compulsion causative, or a causation causative without head movement. We predict both of these examples to have convergent derivations: (36c) contains an inanimate causee and is hence unambiguously assigned a causation causative structure and meaning. (36d) contains an animate causee and is hence compatible with both the compulsion causative and the causation causative. This sentence is thus ambiguous and will only be disambiguated through context. We find no blocking effects in these sentences, as expected.

(36) a.   The coach *bounced* the ball on the floor.   *lexical-inanimate*

  b. # The coach *bounced* the gymnast on the floor.   *lexical-animate*

  c.   The coach *made* the ball *bounce* on the floor.   *analytic-inanimate*

  d.   The coach *made* the gymnast *bounce* on the floor.   *analytic-animate*

3.5   Correspondence between form and meaning

We have seen that the string "*make causee verb*..." can have two underlying sources: it can be a compulsion causative (35), as such causatives are always spelled out as *make...verb*, but it could also be the result of a causation causative without head-movement (34b).[20]We find that a one-way implication holds: whenever we find a sentence spelled out with a lexical causative form, the underlying structure must be one with a $\sqrt{}$P-embedding causative with a causation meaning. The string *make...verb*, on the other hand, can have two distinct sources, but when the causee has been moved out of the way, Rules Apply requires $v_{\mathbf{CAUSE}}$ and $\sqrt{}$ to Fuse and be spelled out as the lexical causative whenever one exists and hence in such cases *make...verb* unambiguously marks the compulsion causative. This state of affairs is summarized in (37) below:

(37) a. **Causee moved out of the way:**
  verb $\Rightarrow$ causation causative
  make...verb $\Rightarrow$ compulsion causative, *or*
                                causation causative (for verbs without a lexically specified
                                causative form)

  b. **Causee not moved out of the way:**
  verb $\Rightarrow$ causation causative
  make...verb $\Rightarrow$ compulsion causative, *or*
                                causation causative (for *any verb*, when head-movement did
                                not occur)

Note that an alternative version of our proposal that states instead that head-movement is obligatory whenever possible will not work: head-movement can skip over intervening XPs, so sensitivity to the causee being in-situ or not would be unexplained. Because a $\sqrt{}$P-embedding (causation) causative without head-movement would be impossible, the "*make causee verb*" string with causation semantics is predicted to not exist, or a separate source for this causation reading would be necessary. (See also footnote 18 and the discussion in section 4.1 below.)

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[20]See also **?** for data showing that causatives of the form "*make causee verb*..." may take on not only a compulsion meaning but also a causation meaning. In particular, **?** shows that *make* causatives—with the causee in its base position—are compatible with both animate and inanimate causers and causees and do not always have a compulsion meaning.

3.6 Summary

In this section we presented an analysis of a previously unobserved pattern of morphological blocking effects in English causatives. In particular, we see the effects of blocking only when the causee is somehow moved out of its canonical position, between $v_{\textbf{CAUSE}}$ and the verb, leaving $v_{\textbf{CAUSE}}$ and the verb linearly adjacent. We argued much in the spirit of Harley's (2008) proposal for Japanese causatives that in such cases, $v_{\textbf{CAUSE}}$ and $\sqrt{}$ must undergo Fusion and be spelled out using a single Vocabulary Item whenever the lexicon contains a lexical causative form for the verb. In the case of compulsion causatives, a null v always intervenes between $v_{\textbf{CAUSE}}$ and the verb, and hence these structures are never spelled out using a lexical causative form.

The nature of the blocking effect in English is the same as in Japanese: in both cases, we propose, the important question is whether or not the causative morpheme and the lexical verb are adjacent to one another or whether they are separated by other material. As the English demonstrates clearly, the relevant notion of adjacency is one of *linear order*, not of syntactic structure, unlike in Harley's (2008) proposal for Japanese causatives. However, the analysis Harley proposes for Japanese is easily amenable to the proposal made here without changes, once the notion of Fusion we have proposed is accepted. This is so because in Japanese, word order serves to obscure the difference between linear and structural adjacency: there are no additional intervening nodes between $\sqrt{}$ and $v_{\textbf{CAUSE}}$—with the exception of v which intervenes both linearly and structurally at the same time—since the language is head-final and linearizes all DPs before the verbal complex.

Our observations and proposal here uncover deep uniformities between the unrelated languages of English and Japanese. We note that there is one remaining and notable difference between the two languages: Japanese, but not English, has lexical causatives of transitive and unergative verbs (Pylkkänen, 2002). An example of contrasting lexical and analytic causatives of a transitive verb 'put on' in Japanese is given in (26) above.

Pylkkänen (2002) proposes that a "Voice bundling" parameter is responsible for this difference in available lexical causatives in English and Japanese. In particular, the parameter determines whether the following two functions must be "bundled" and occur on the same head, or not: $v_{\textbf{CAUSE}}$, which as we have seen may embed a $\sqrt{}$P to form a lexical causative, and Voice, which introduces agentive subjects (cf Kratzer, 1996). In English, $v_{\textbf{CAUSE}}$ and Voice must be "bundled" and may only have one specifier, hosting the sentential subject. As a consequence, the English $v_{\textbf{CAUSE}}$ may only embed unaccusative verbs, as it does not contain a specifier position where the subject of unergative and transitive verbs could be introduced. In Japanese, on the other hand, the two heads, $v_{\textbf{CAUSE}}$ and Voice and not bundled. Instead, they are free to occur separately in the tree, and each can host its own specifier. As in English, in Pylkkänen's system, Voice is responsible for introducing the sentential subject. The additional specifier position of $v_{\textbf{CAUSE}}$, which is separate from that of Voice in Japanese, can be used to introduce the subject of a transitive or unergative

verb. Hence Japanese, but not English, is predicted to allow lexical causatives of unergative and transtive verbs. Here we will follow Pylkkänen's (2002) approach to this puzzle, which is compatible with the proposal we have presented in this paper. We refer the reader to Pylkkänen (2002) for more details.

4 Discussion

In this section we discuss two details related to our proposal above: the notions of *direct* and *indirect* causation in previous literature, and the status of traces in the theory, in light of *wanna*-contraction.

4.1 Direct and indirect causation

Much previous literature on English lexical and analytic (*make*) causatives have described a difference between *direct* and *indirect* causation, roughly corresponding to whether or not the causative action described in the sentence was done in a canonical fashion or not. (See Wolff (2003) for a review of characterizations of this contrast.) Consider (38) below. McCawley (1978), Kiparsky (2005), a.o. describe a contrast within pairs of this form, where both are variants of causation but they may describe slightly different situations, (38a–b).

(38)   a.   John *started* the engine.   *direct causation*

        b.   John *made* the engine *start*.   *indirect causation*

For many speakers, *start the engine* sounds like the result of turning a key, for example, while *make the engine start* corresponds to a non-standard fashion of making the engine start, for example with a match. However, this prior literature on direct and indirect causation in English, like the previous literature on English causatives in general, does not control for the position of the causee. If the causee is moved from its canonical position, the *make...verb* variant becomes degraded, even with an intended indirect causation meaning, as expected by our analysis. The fact that (39b) is degraded makes it clear that even these cases of indirect causation are built on the $\sqrt{}$P-embedding causation causative structure which is subject to blocking effects when the causee is moved. The string *make start* is itself possible, but only with a compulsion causative structure (40).

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[20]Note that in vP-embedding (compulsion) causatives, both languages allow for the embedding of transitive and unergative verbs. In these cases, the agentive causee is generated below $v_{\textbf{CAUSE}}$, in the embedded Spec,vP or, for Pylkkänen, Spec,VoiceP.

A consequence of this proposal is that agentive causees of Japanese lexical causatives and agentive causees of Japanese analytic causatives must occupy different syntactic positions. The contrast in example (26) supports this view: the causee in an analytic causative of a transitive verb behaves as a subject for the purposes of the subject-oriented reflexive *jibun* (26b) but the causee in a lexical causative of a transitive verb does not (26a).

(39) a. Which engine did John *start* ___ with a match?

b. *Which engine did John *make* ___ *start* with a match?

(40) Which racer did the coach *make* ___ *start* on time?

We believe that such contrasts between different linearizations of causation causatives as in (38) are real, but that they have a (Gricean) pragmatic source, along the lines of the proposal in Mc-Cawley (1978), Kiparsky (2005), a.o.: choosing to pronounce the more "complex" structure when a "simpler" one was available corresponds to a "non-canonical" method of causation, while the smaller structure is generally used if nothing else would make the speaker choose the complex form.[21] Importantly, both are forms of causation causatives and hence make up only half of the paradigm of interest here—the one that contrasts causation causatives with compulsion causatives.

4.2 On the status of traces

In this section we discuss the status of traces in our theory, in particular with relation to the well-known case of *wanna*-contraction. Lakoff (1970) and many others have noted that *wanna*-contraction is possible only if no words occur between *want* and *to*, (41).

(41) a. I *want* Jim *to* visit Fred.

b. *I *wanna* Jim visit Fred.

Much attention has been given in the literature to the fact that some empty categories appear to block *wanna* contraction. In (42), movement has occurred from a position below the verb, and the question is grammatical. In (43), on the other hand, movement has occurred from the subject position, and the question is ungrammatical.

(42) a. Who do you *want* PRO *to* visit ___?

b. Who do you *wanna* visit ___?

(43) a. Who do you *want* ___ *to* visit Fred?

b. *Who do you *wanna* visit Fred?

A common characterization of this phenomenon is that Case-marked traces blocks contraction. However, if *wanna*-contraction involves an operation similar to Fusion as described in this paper, it is surprising that linearly intervening traces would block contraction (43).

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[21]Many speakers we have consulted find the *make the engine start* version of the sentence degraded even when it describes a scenario with an unusual way of starting the engine. We can interpret this as a weak effect whereby, when head-movement is possible, many speakers prefer it to the unmoved spell-out. See relevant discussion earlier in footnote 18.

We note, however, that other researchers have argued that it is the presence of an intervening null head that blocks contraction in examples like (43), not the trace itself (Snyder and Rothstein, 1992; Bošković, 1997). We have proposed that Fusion is not sensitive to traces because those are deleted at PF before Fusion applies, but that Fusion is nonetheless sensitive to intervening heads, which must be dealt with in the process of Vocabulary Insertion and spell-out. Under this view, *wanna*-contraction may not be a counter-example to Fusion's insensitivity to traces, but instead reflects the presence of null intervening *heads*.

Another approach to *wanna*-contraction that is consistent with our theory is that *wanna*-contraction is blocked by the intervening *who* in its base position. This is a case of counter-feeding: When the *wanna*-contraction rule could apply, *who* occurs between *want* and *to*. Hence, contraction cannot apply. Movement of *who* comes too late to feed contraction (Bresnan, 1978; Arregi and Nevins, 2012).

Finally, although *wanna*-contraction has been extensively discussed in the literature, other types of contraction exist as well. For example, finite auxiliary contraction involves a contraction of finite auxiliaries (*have*, *be*, and modals *will* and *would*) with material to their left (Zwicky and Pullum 1983; examples here from Goodall 2005):

(44)   a.   *We've* eaten the pie.

     b.   *We're* eating the pie.

     c.   *We'll* eat the pie.

     d.   *We'd* eat the pie.

This phenomenon resembles *wanna*-contraction in several ways. First, it involves contraction of an element in T with one to its left. If we believe that *to* occurs in T, this description is very similar to that of *wanna*-contraction (but see Bresnan (1971) for an alternative view). Second, it is sensitive to intervening material and cannot skip over a lexical subject to contract with something further to the left. We have seen a similar restriction on *wanna*-contraction in (41b).

(45)   *I don't know *who's* John ___ going to the party with.

Despite these similarities, there are also several differences between *wanna*-contraction and finite auxiliary contraction. Most importantly, finite auxiliary contraction appears not to be sensitive to the existence of traces, as shown by the grammaticality of (46b). We take this to support the view that the relevant problem with *wanna*-contraction does not have anything to do with traces, but rather with something else—either an intervening head or the *wh*-word in its base position.

(46)   a.   Who do you *think* ___ *is* dancing?

     b.   Who do you *think's* dancing?

5 Conclusion

In this paper we presented a previously unobserved pattern of morphological blocking in English causative constructions. We have shown that this pattern is similar to the well-studied pattern of morphological blocking with Japanese causatives. We presented evidence of deep parallels between the English and Japanese causatives: both languages have two kinds of causatives, *causation* causatives and *compulsion* causatives, associated exclusively with a different syntax and a different semantics. We showed that the English facts are complicated by the head-initial structure of English phrases, where the canonical word-order serves to obscure the blocking effect as well as the one-to-one correspondence between form and meaning of the causative found in Japanese. However, we have shown that when the causee is moved out of the way, leaving $v_{\textbf{CAUSE}}$ and $\sqrt{}$ linearly adjacent, the parallels between English and Japanese come to light.

We developed an account of the blocking in English causatives within the framework of Distributed Morphology, building on work by Embick and Marantz (2008) and Harley (2008). We argued that the blocking effect is sensitive not to structural adjacency, as previously argued for Japanese (Harley, 2008), but instead to linear adjacency, as assumed in Embick and Marantz (2008). We proposed a reformulation of the operation of Fusion that is sensitive to linear adjacency and showed how our analysis captures the intricate paradigm of English causatives. We also showed how our proposal relates to the distinction between *direct* and *indirect* causation discussed in previous literature.

The blocking presented here constitutes a strong argument for the post-syntactic resolution of derivational morphology, as in the DM framework and unlike in the Lexicalist Hypothesis. As argued at length in Embick and Marantz (2008), blocking relationships between words and multi-word expressions, first observed by Poser (1992), pose a problem for the Lexicalist Hypothesis. Lexicalist approaches to Poser blocking must stipulate direct competition between words and phrases (structures which under DM are never generated) and stipulate that words win over phrases (Poser, 1992; Andrews, 1990; Hankamer and Mikkelsen, 2005). However, in the case of blocking with causatives that we have shown here, the competing structures are not always single words, nor are they even constituents.

In particular, the sensitivity of the blocking effect to linear adjacency shows that the relevant processes must occur post-linearization. This finding has implications for our understanding of the relative ordering of post-syntactic operations that take place on the PF branch. In particular, we are able to precisely position Fusion into the architecture of post-syntax proposed, for example, in Arregi and Nevins (2012, p. 278). Fusion must occur quite late in the derivation: *after* Linearization and *before* Vocabulary Insertion.

References

Andrews, Avery. 1990. Unification and morphological blocking. *Natural Language & Linguistic Theory* 8:507–557.

Aronoff, Mark. 1976. *Word formation in generative grammar*. MIT Press.

Arregi, Karlos, and Andrew Ira Nevins. 2012. *Morphotactics: Basque auxiliaries and the structure of spellout*. Springer.

Blanco, Mercedes Tubino. 2010. Contrasting causatives: a minimalist approach. Doctoral Dissertation, University of Arizona.

Bošković, Željko. 1997. *The syntax of nonfinite complementation: An economy approach*. MIT Press.

Bresnan, Joan. 1971. Contraction and the transformational cycle in English. Manuscript, Massachusetts Institute of Technology.

Bresnan, Joan. 1978. Contraction and the transformational cycle in English. Indiana University Linguistics Club.

Chomsky, Noam. 1993. A minimalist program for linguistic inquiry. In *The view from Building 20*, ed. Kenneth Hale and Samuel Jay Keyser. MIT Press.

Embick, David, and Alec Marantz. 2008. Architecture and blocking. *Linguistic Inquiry* 39.

Embick, David, and Rolf Noyer. 2001. Movement operations after syntax. *Linguistic Inquiry* .

Erlewine, Michael Yoshitaka, and Hadas Kotek. 2013. A streamlined approach to online linguistic surveys. URL `http://ling.auf.net/lingbuzz/001802/`, manuscript, Massachusetts Institute of Technology.

Ernst, Thomas. 2002. *The syntax of adjuncts*. Cambridge University Press.

Fodor, Jerry Alan. 1970. Three reasons for not deriving "kill" from "cause to die". *Linguistic Inquiry* 1:429–438.

Goodall, Grant. 2005. Contraction. In *Blackwell companion to syntax*, ed. Martin Everaert and Henk van Riemsdijk, volume 1, 688–704. Blackwell, Oxford.

Hale, Kenneth, and Samuel Jay Keyser. 1993. On argument structure and the lexical expression of syntactic relations. In *The view from Building 20*.

Halle, Morris. 1997. Distributed Morphology: Impoverishment and fission. In *MIT working papers in linguistics 30*, 425–449.

Halle, Morris, and Alec Marantz. 1993. Distributed Morphology and the pieces of inflection. In *The view from Building 20*. MIT Press.

Hankamer, Jorge, and Line Mikkelsen. 2005. When movement must be blocked: A response to Embick and Noyer. *Linguistic Inquiry* 36:85–125.

Harley, Heidi. 2008. On the causative construction. In *The Oxford handbook of Japanese linguistics*, ed. Shigeru Miyagawa and Mamoru Saito. Oxford.

Jacobsen, Wesley M. 1992. *The transitive structure of events in Japanese*. Kurosio.

Johnson, Kyle. 1991. Object positions. *Natural Language & Linguistic Theory* 9.

Kiparsky, Paul. 1973. 'elsewhere' in phonology. In *A festschrift for Morris Halle*, ed. Paul Kiparsky and Stephen R. Anderson. Holt, Rinehart, and Winston.

Kiparsky, Paul. 2005. Blocking and periphrasis in inflectional paradigms. In *Yearbook of morphology 2004*, 113–135. Springer.

Koizumi, Masatoshi. 1995. Phrase structure in minimalist syntax. Doctoral Dissertation, Massachusetts Institute of Technology.

Kratzer, Angelika. 1996. Severing the external argument from its verb. In *Phrase structure and the lexicon*, ed. Johan Rooryck and Laurie Zaring. Kluwer Academic Publishers.

Kuno, Susumu. 1973. *The structure of the Japanese language*. MIT Press.

Kuroda, Sige-Yuki. 1965. Causative forms in Japanese. *Foundations of Language* 1:30–50.

Kuroda, Sige-Yuki. 1993. Lexical and productive causatives in Japanese: an examination of the theory of paradigmatic structure. *Journal of Japanese Linguistics* 15:1–81.

Lakoff, George. 1965. On the nature of syntactic irregularity. In *Mathematical linguistics and automatic translation, report no. nsf-16*. the Computation Laboratory of Harvard University, Cambridge, Mass.

Lakoff, George. 1970. *Abstract syntax*. Holt, Rinehart, and Winston.

Lauer, Sven. 2010. Periphrastic causatives in english: What do they mean? Manuscript, Stanford.

Levin, Beth. 1993. *English verb classes and alternations: A preliminary investigation*. University of Chicago Press.

Levin, Beth, and Malka Rappaport Hovav. 1995. *Unaccusativity: At the syntax-lexical semantics interface*. MIT Press.

Manning, Christopher D., Ivan Andrew Sag, and Masayo Iida. 1999. The lexical integrity of Japanese causatives. In *Studies in contemporary phrase structure grammar*. Cambridge University Press.

Marantz, Alec. 1984. *On the nature of grammatical relations*. MIT Press.

Marantz, Alec. 1988. Clitics, morphological merger, and the mapping to phonological structure. In *Theoretical morphology*. Academic Press.

Matushansky, Ora. 2006. Head movement in linguistic theory. *Linguistic Inquiry* 37:69–109.

McCawley, James D. 1978. Conversational implicature and the lexicon. In *Pragmatics*, volume 9 of *Syntax and Semantics*. Academic Press.

Miyagawa, Shigeru. 1980. Complex verbs and the lexicon. Doctoral Dissertation, University of Arizona.

Miyagawa, Shigeru. 1984. Blocking and Japanese causativization. *Foundations of Language* 9:177–207.

Miyagawa, Shigeru. 1998. *(S)ase* as an elsewhere causative and the syntactic nature of words. *Journal of Japanese Linguistics* .

Miyagawa, Shigeru. 2010. Blocking and caustatives: unexpected competition across derivations. In *Proceedings of the 5th Formal Approaches to Japanese Linguistics*. MITWPL.

Miyagawa, Shigeru. 2012. *Case, argument structure, and word order*. Routledge.

Poser, William J. 1992. Blocking of phrasal constructions by lexical items. In *Lexical matters*, ed. Ivan Andrew Sag and Anna Szabolcsi. CSLI Publications.

Pylkkänen, Liina. 2002. Introducing arguments. Doctoral Dissertation, Massachusetts Institute of Technology.

Ross, Háj. 1967. Constraints on variables in syntax. Doctoral Dissertation, Massachusetts Institute of Technology.

Shibatani, Masayoshi. 1973. Semantics of Japanese causativization. *Foundations of Language* 9:327–373.

Siddiqi, Daniel. 2006. Minimize exponence: economy effects on a model of the morphosyntactic component of the grammar. Doctoral Dissertation, University of Arizona.

Siddiqi, Daniel. 2009. *Syntax within the word: economy, allomorphy, and argument selection in Distributed Morphology*. John Benjamins.

Snyder, William, and Susan Rothstein. 1992. A note on contraction, Case, and complementizers. *The Linguistic Review* 251–266.

Svenonius, Peter. 2012. Spanning. Manuscript, University of Tromsø.

Watanabe, Akira. 1993. Agr-based case-theory and its interaction with the A-bar system. Doctoral Dissertation, Massachusetts Institute of Technology.

Wolff, Phillip. 2003. Direct causation in the linguistic coding and individuation of causal events. *Cognition* 88:1–48.

Zenno, Y. 1985. Paradigmatic structure and japanese idioms. Master's thesis, The Ohio State University.

Zwicky, Arnold M., and Geoffrey K. Pullum. 1983. Cliticization vs. inflection: English *n't*. *Language* 59.

Appendix

The grammaticality judgments reported in this paper are based on an online grammaticality survey conducted using items we constructed for use in another study. This other study, currently in progress with several additional collaborators,[22] is an ERP study whose purpose is to test the brain signature of *blocked* forms compared to those that are semantically deviant but syntactically well-formed. In the paradigm in (47), repeated from (14) above, the critical cases are (47b,c), which are both deviant but—we argue—for different reasons. Preliminary findings show that indeed, syntactically ungrammatical sentences like (47c) elicit a different brain response (P600) from semantically odd ones (47b) (N400), but this work is still in progress.

(47) **English causatives with moved causees:**

    a.   That's the ball that the coach *bounced* ___ on the floor.   *lexical-inanimate*

    b. # That's the gymnast that the coach *bounced* ___ on the floor.   *lexical-animate*

    c. *That's the ball that the coach *made* ___ *bounce* on the floor.   *analytic-inanimate*

    d.   That's the gymnast that the coach *made* ___ *bounce* on the floor.   *analytic-animate*

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Methods and materials

There were 48 items in the survey. There were 24 sentence templates for target sentences, with structures as in the sample item in (47) above. Each template contained 4 sentences in a 2×2 design, crossing the factors *causative type* (*lexical* vs. *analytic*) and *animacy* (*animate* vs. *inanimate*). The predicates used in these sentences all had lexical as well as analytic *make* causative forms, and were chosen from verb lists in Levin (1993) and Levin and Rappaport Hovav (1995). Lexical verbs are not repeated within the target items. In addition to these sentences, 24 sentences acted as fillers. The filler sentences contained similar structures to those of the targets (in using clefted sentences, crossing lexical and analytic causatives, and crossing animate and inanimate causees). Half of the fillers were grammatical and the other half was ungrammatical. Ungrammatical fillers included sentences with predicates that do not have a lexical causative form, sentences that were grammatically deviant and sentences that were semantically odd. Grammatical fillers included lexical causative sentences with animate causees in contexts that supported direct causation and hence should be judged as felicitous, and subject clefts with analytic causatives and inanimate causees. The full list of target and filler sentences is provided at the end of the appendix.

The items were pseudo-randomized and put into 8 lists, 4 of which were the reverse of the others, using a Latin Square design. There was at least one filler item at the beginning of each list, but no other restrictions were put on the order of items. The lists, randomization process as well as the HTML templates used for this experiment were created using *turktools* software (Erlewine and Kotek, 2013). The surveys were uploaded to Amazon's Mechanical Turk for ratings. Computer IPs of Turk Workers were restricted to the USA only. Participants were instructed to respond to no more than one survey. For each sentence in the survey, participants were asked to decide whether it sounded "natural" or "unnatural." There were two practice items together with the instructions at the beginning of the survey.

Results

80 subjects participated in the survey, and were paid $0.20 for their participation. Participants were asked about their native language, but told that the answer would not affect payment. Participants who answered more than one survey, had accuracy below 75% on the fillers, or reported that they were not native speakers of English were excluded from the analysis. Four participants were excluded from the analysis for these reasons. The average accuracy on filler items was 89.25%.

Average acceptability rates for the target sentences in each condition are as follows (see Figure 2):[23]

(48)

Condition	Rating
lexical-inanimate	0.896
lexical-animate	0.316
analytic-inanimate	0.321
analytic-animate	0.774

A two-way ANOVA predicting the acceptability of the sentences from the factors *animacy* and *causative type* reveals a main effect of *animacy* ($p < 0.01$), such that sentences with ina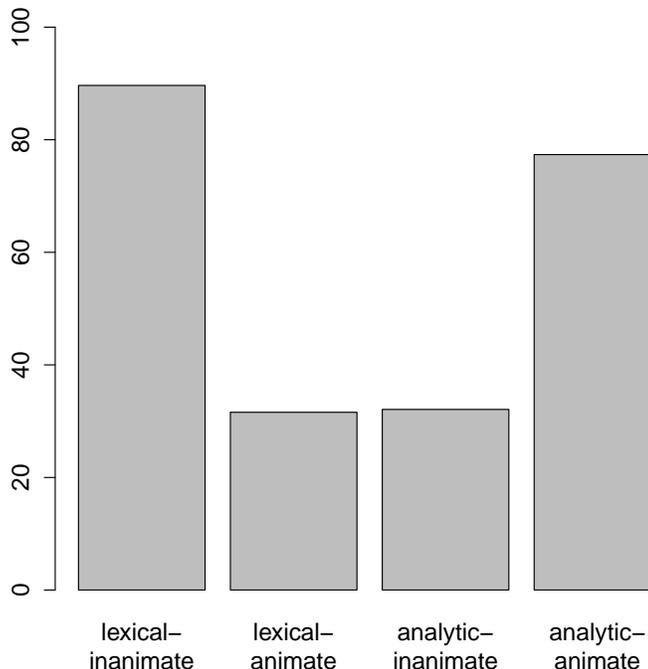nimate causees were rated higher than sentences with animate causees, a main effect of *causative type* ($p < 0.05$) such that lexical causatives were rated higher than analytic causatives, and an interaction of *causative type* with *animacy* ($p < 0.01$), that is driven by the fact that sentences with inanimate causees are rated higher with lexical causatives compared to analytic causatives, but animate causees exhibit the reverse pattern: they were rated higher with analytic causatives than with lexical causatives.

Figure 2: Average ratings by condition

Discussion

The findings here are compatible with the grammaticality judgments we have presented in this paper. In particular, we find a clear contrast between the sentences that we have marked as ungrammatical or deviant and the sentences that we have marked as grammatical. Our findings also reflect informal judgments we have collected from several native English speakers: lexical causatives are generally easier to process and judge compared to analytic (*make*) causatives.

Recall that for lexical causatives with animate causees, we predict possible semantic deviance but not ungrammaticality, where the question of how strong the deviance is perceived depends strongly on the individual participants' ability to imagine a scenario where the direct action on the causee is warranted. Again, for the purposes of our experiment it was important to construct examples that would be found as deviant by most participants, but as we have shown above, some sentences are perfectly acceptable. An example is given in (49) below.

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[23]We additionally have preliminary findings from 9 participants who were exposed to these sentences in a laboratory setting—as part of the aforementioned ERP study in progress together with other collaborators—and the results we have obtained are in line with the ratings reported here.

(49) a. The mother *bounced* the child on the trampoline.

b. That's the child that the mother *bounced* on the trampoline.

We note that both main effects observed in the analysis—both that of *animacy* and that of *causative type* are driven by the interaction. Specifically, it is driven by the fact that the two conditions we have marked as ungrammatical or deviant—*lexical-animate* and *analytic-inanimate* are judged as similarly degraded—but there is a difference among the grammatical conditions, such that the *lexical-inanimate* condition is judged as more acceptable than the *analytic-animate* condition. As a consequence, we refrain from over-interpreting the main effects in our analysis and point only to the interaction as verifying the judgments we have reported in this paper.

Filler items

(50) **Ungrammatical fillers:**

a. That's the girl that the teacher played with the doll.

b. That's the student that the councilor made skip the road.

c. That's the model that the photographer made smile a sandwich.

d. That's the felon that the interrogator confessed to the crime.

e. That's the pony that the girl learned a new trick.

f. That's the receptionist that the manager made greet some the cats.

g. That's the button that the seamstress fell to the floor.

h. That's the apple that the farmer made ready to eat.

i. That's the crayon that the boy colored a picture.

j. That's the glass that the waiter made full of wine.

k. That's the computer that the programmer updated the software.

l. That's the camera that the artist made use in black and white.

(51) **Grammatical fillers:**

a. That's the witness that the police protected from the mafia.

b. That's the boy that the principal made stay after class.

c. That's the mistress that the politician hid from his wife.

d. That's the crowd that the police made scatter using fire hoses.

e. That's the boy that the bully pushed around in the yard.

f. That's the businessman that the flight attendant made fly economy.

g. That's the wall that the carpenter broke into several pieces.

h. That's the rabbit that the magician made vanish into thin air.

i. That's the film that the assistant developed in the darkroom.

j. That's the car that the mechanic made his apprentice take apart.

k. That's the baby that the mother bounced on the trampoline.

l. That's the note that the teacher made his student read to the whole class.

Target items

(52) a. That's the boat that the athelete sailed every day.

b. That's the sailor that the captain sailed in the race.

c. That's the boat that the athelete made sail every day.

d. That's the sailor that the captain made sail in the race.

(53) a. That's the code that the programmer ran to fix the bug.

b. That's the sprinter that the coach ran for 2 hours.

c. That's the code that the programmer made run to fix the bug.

d. That's the sprinter that the coach made run for 2 hours.

(54) a. That's the prize that the announcer dangled over the crowd.

b. That's the acrobat that the ringmaster dangled over the crowd.

c. That's the prize that the announcer made dangle over the crowd.

d. That's the acrobat that the ringmaster made dangle over the crowd.

(55) a. That's the statue that the mayor stood on a pedestal.

b. That's the suspect that the police stood in a line up.

c. That's the statue that the mayor made stand on a pedestal.

d. That's the suspect that the police made stand in a line up.

(56) a. That's the spoon that the clown balanced on his nose.

b. That's the gymnast that the coach balanced on the beam.

c. That's the spoon that the clown made balance on his nose.

d. That's the gymnast that the coach made balance on the beam.

(57) a. That's the bike that the rider leaned against the wall.

b. That's the gang that the officer leaned against the wall.

c. That's the bike that the rider made lean against the wall.

d. That's the gang that the officer made lean against the wall.

(58) a. That's the bat that the player swung too early.

b. That's the monkey that the trainer swung from a branch.

c. That's the bat that the player made swing too early.

d. That's the monkey that the trainer made swing from a branch.

(59) a. That's the cake that the cook rested in the oven.

b. That's the patient that the nurse rested in bed.

c. That's the cake that the cook made rest in the oven.

d. That's the patient that the nurse made rest in bed.

(60) a. That's the plank that the worker laid on the floor.

b. That's the judge that the therapist laid on the couch.

c. That's the plank that the worker made lie on the floor.

d. That's the judge that the therapist made lie on the couch.

(61) a. That's the letter that the mailman slid under the door.

b. That's the skater that the coach slid on the ice.

c. That's the letter that the mailman made slide under the door.

d. That's the skater that the coach made slide on the ice.

(62) a. That's the wire that the sculptor bent artfully.

b. That's the gymnast that the coach bent backwards.

c. That's the wire that the sculptor made bend artfully.

d. That's the gymnast that the coach made bend backwards.

(63) a. That's the dish that the chef changed on the menu.

     b. That's the assistant that the supervisor changed in the bathroom.

     c. That's the dish that the chef made change on the menu.

     d. That's the assistant that the supervisor made change in the bathroom.

(64) a. That's the stroller that the mother collapsed on the bus.

     b. That's the amateur wrestler that the champion collapsed to the floor.

     c. That's the stroller that the mother made collapse on the bus.

     d. That's the amateur wrestler that the champion made collapse to the floor.

(65) a. That's the ice pack that the coach froze before the game.

     b. That's the robber that the police froze in place.

     c. That's the ice pack that the coach made freeze before the game.

     d. That's the robber that the police made freeze in place.

(66) a. That's the purse that the woman snapped shut angrily.

     b. That's the pupil that the tutor snapped out of a dream.

     c. That's the purse that the woman made snap shut angrily.

     d. That's the pupil that the tutor made snap out of a dream.

(67) a. That's the puck that the player slipped towards the goal.

     b. That's the mistress that the politician slipped out the back door.

     c. That's the puck that the player made slip towards the goal.

     d. That's the mistress that the politician made slip out the back door.

(68) a. That's the battleship that the torpedo sank in the harbor.

     b. That's the swimmer that the prankster sank to the bottom.

     c. That's the battleship that the torpedo made sink in the harbor.

     d. That's the swimmer that the prankster made sink to the bottom.

(69) a. That's the book that the student returned to the library.

     b. That's the intern that the supervisor returned for another shift.

     c. That's the book that the student made return to the library.

     d. That's the intern that the supervisor made return for another shift.

(70) a. That's the bottle that the waiter shook before opening.

       b. That's the boy that the principal shook with fear.

       c. That's the bottle that the waiter made shake before opening.

       d. That's the boy that the principal made shake with fear.

(71) a. That's the idea that the team floated at the meeting.

       b. That's the boy that the instructor floated in the pool.

       c. That's the idea that the team made float at the meeting.

       d. That's the boy that the instructor made float in the pool.

(72) a. That's the balloon that the clown burst with a pin.

       b. That's the defendant that the judge burst into tears.

       c. That's the balloon that the clown made burst with a pin.

       d. That's the defendant that the judge made burst into tears.

(73) a. That's the wood that the carpenter stripped of all varnish.

       b. That's the performer that the manager stripped at the danceclub.

       c. That's the wood that the carpenter made strip of all varnish.

       d. That's the performer that the manager made strip at the danceclub.

(74) a. That's the bottle that the mother adjusted to room temperature.

       b. That's the driver that the company adjusted to the new car.

       c. That's the bottle that the mother made adjust to room temperature.

       d. That's the driver that the company made adjust to the new car.

(75) a. That's the money that the shopper withdrew from his account.

       b. That's the candidate that the scandal withdrew from the race.

       c. That's the money that the shopper made withdraw from his account.

       d. That's the candidate that the scandal made withdraw from the race.