Caused-Motion and Caused-Position: Syntactic Patterns and Semantic Networks

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Abstract

According to Goldberg (1995), placement verbs (such as put) are instantiated in the Caused-Motion Construction. Rohde (2001), however, argued that placement verbs in fact occur in a different construction, which she names the Caused-Position Construction, whose semantic value is not ‘cause to move’ but rather ‘cause to be positioned’. The present paper redefines and justifies the postulation of Caused-Position Construction. The Caused-position Construction is compatible with not only placement verbs but also a variety of other verbs, such as verbs of creation (write or build) or certain stative verbs (want or need), many of which also occur in the Locative Inversion construction. Further, a similar distinction between Caused-Motion and Caused-Position can be attested in Mandarin as well, which suggests that the distinction between two patterns of spatial causation may not be idiosyncratically confined to the English language but motivated by the general patterns of human cognition.

Keywords: Construction Grammar; Caused-Motion Construction; Caused-Position Construction; Locative Inversion; Polysemy; English; Mandarin

1 Introduction

In her seminal monograph on Construction Grammar (CxG), Goldberg (1995) denies the strict division between lexicon and syntax, assuming no morphosyntactic constraints that are totally irrelevant to lexicon. CxG is thus a monostratal grammatical theory that aims to analyze abstract constructions that embed meaningful symbols as a higher layer of meaningful symbols.

CxG offers a non-compositional approach to analyze form-meaning pairing units. But a recurrent puzzle lies in defining what a ‘unit’ is. How should each unit, or construction, be distinguished from each other? This paper aims to probe into this issue and present a case where syntactic patterns and semantic networks may help define distinct constructions. Specifically, we will show how two closely related constructions, Caused-Motion Construction and Caused-Position Construction, can be subtly but clearly differentiated by shedding light onto their semantic and syntactic division of labor.

2 Previous studies

According to Goldberg (1995: Ch. 7), the English Caused-Motion Construction (henceforth Caused-Motion) is a construction that is syntactically (1) and semantically specified as (2).

(1) [subj [v obj obl]]
(2) X causes Y to move Z

where OBL is a directional phrase and V a non-stative verb. (3) is an example (our own):

(3) a. I put the book on the table.
   ‘I, by putting, caused the book to move onto the table.’
   b. I kicked the ball into the goalpost.
   ‘I, by kicking, caused the ball to move into the goalpost.’
The mapping between semantic and syntactic structures of the construction as in Table 1 (Goldberg 1995:163, slightly modified)

<table>
<thead>
<tr>
<th>Table 1: Caused-Motion Construction</th>
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<tbody>
<tr>
<td>Sem</td>
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<td></td>
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<tr>
<td>Syn</td>
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</tbody>
</table>

Rohde (2001) argued that cases like (3a) are not instances of the Caused-Motion but rather a different construction which she names Caused-Position Construction (henceforth Caused-Position). That is, the definition of (3a) should be ‘I, by putting, caused the book to be positioned on the table’. Rohde’s argument is that verbs of putting and positioning (PaP verbs) such as put, sit, place, and lay, do not occur in Caused-Motion but in Caused-Position. These two constructions are syntactically and semantically similar but should be distinguished given their clear differences in PP-collocations. The evidence supporting this distinction is that the PaP verbs in general do not allow directional PPs (such as to/into/onto NP). She argues that in the construction where the PaP verbs occur, OBL is not a dynamic path but a static endpoint (which she names goal point) where the theme gets positioned in/at/on. In other words, the constructions with the PaP verbs cannot be semantically ‘X causes Y to move Z’ but rather ‘X causes Y to be positioned Z’. Following Goldberg’s template, she presents the illustration of the construction as in Table 2 (Rohde 2001:230)

<table>
<thead>
<tr>
<th>Table 2: Caused-Position Construction</th>
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<tbody>
<tr>
<td>Sem</td>
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<td></td>
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<tr>
<td>Syn</td>
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</table>

Based on her corpus data, Rohde classifies English prepositions based on the Index of Dynamicity, which is the number of occurrences of a preposition in dynamic context (e. g. preposition into occurring in the context of I moved into the room) divided by its total number of occurrences. The Index of Dynamicity of 19 prepositions are shown in Table 3. Rohde divides the preposition into dynamic prepositions (Index of Dynamicity > 0.5) and static prepositions (Index of Dynamicity < 0.5). For example, into and onto are highly dynamic prepositions, whereas in and on are highly static ones.

Based on the partitioning between static and dynamic prepositions, Rohde makes two arguments regarding the difference between how the Caused-Motion and the Caused-Position instantiate prepositions.

(i) In general, Caused-Motion instantiates a dynamic preposition, whereas Caused-Position instantiates a static preposition.

(ii) When Caused-Motion instantiates a static preposition, the construction coerces the preposition into a dynamic reading (move). The opposite is true for Caused-Position, which coerces a dynamic preposition into a static reading (be positioned).

Rohde presents concrete corpus and experimental evidence for argument (i). For example, in the “distribution of PPs with put in 250 randomly selected utterances describing concrete spatial motion” (p. 210), we see that 83.6% of the PPs are static (e. g. put X in Y) and the rest are dynamic (e. g. put X into Y).

Goldberg (1995:Ch. 7) has argued that the preference for static preposition in cases like put X in Y can be explained in terms of constructional coercion. Constructional coercion is the semantic conformation between the lexical item and the construction. As Michaelis (2004:245) describes it, ‘if a lexical item is semantically incompatible with its morphosyntactic context, the meaning of the lexical item conforms to the meaning of the structure in which it is embedded.”

Within the Caused-Motion, argues Goldberg, put X in Y is coerced into the dynamic reading of ‘by putting, cause X to move into Y’ even though the preposition instantiated is in and not into. Rohde posits the argument (ii), that it is the other way around: put X into Y fully instantiates the static reading of Caused-Position, whereas put X into Y is coerced into a static reading of ‘by putting, cause X to be positioned in Y’ even though the instantiated preposition is into rather than in.
Table 3: Index of Dynamicity of English prepositions

<table>
<thead>
<tr>
<th>Preposition</th>
<th>Index of Dynamicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through</td>
<td>0.985</td>
</tr>
<tr>
<td>Onto</td>
<td>0.964</td>
</tr>
<tr>
<td>Into</td>
<td>0.932</td>
</tr>
<tr>
<td>To</td>
<td>0.915</td>
</tr>
<tr>
<td>Under</td>
<td>0.884</td>
</tr>
<tr>
<td>Toward</td>
<td>0.874</td>
</tr>
<tr>
<td>Out</td>
<td>0.851</td>
</tr>
<tr>
<td>Out of</td>
<td>0.838</td>
</tr>
<tr>
<td>From</td>
<td>0.802</td>
</tr>
<tr>
<td>Over</td>
<td>0.717</td>
</tr>
<tr>
<td>By</td>
<td>0.674</td>
</tr>
<tr>
<td>Along</td>
<td>0.624</td>
</tr>
<tr>
<td>Across</td>
<td>0.600</td>
</tr>
<tr>
<td>Between</td>
<td>0.400</td>
</tr>
<tr>
<td>In</td>
<td>0.163</td>
</tr>
<tr>
<td>At</td>
<td>0.158</td>
</tr>
<tr>
<td>Outside</td>
<td>0.157</td>
</tr>
<tr>
<td>Inside</td>
<td>0.156</td>
</tr>
<tr>
<td>On</td>
<td>0.148</td>
</tr>
</tbody>
</table>

The argument (ii) is difficult to justify with cases of PaP verbs alone, since PaP verbs themselves lexicalize the Caused-Motion sense, even if they occur in the Caused-Position construction (Rohde, 2001:236). For example, the verb *put* itself means to move something to a place. Rohde’s argument was that even if the verb *put* encodes motion, the Caused-Position construction (where the verb occurs) does not. This relationship between the verb and the construction makes it difficult to judge whether the preposition *into* in *put X into Y* is given a dynamic reading (in coherence with the dynamic meaning of the verb) or coerced into a static reading (in coherence with the static goal point of the construction). In order to justify that the coercion to static reading indeed occurs in Caused-Position, we need to examine cases of this construction with verbs other than PaP verbs, where there is no motion implied by the verb.

### 3 Research Goals

The research questions of this paper are twofold:

- **Is the instantiation of the Caused-Position limited to PaP verbs, or does the construction embrace other verbs as well?** By investigating other verbs used within the Caused-Position, we can further investigate whether the coercion hypothesis is true and justify the distinction between Caused-Position and Caused-Motion.

- **Does the distinction between Caused-Motion and Caused-Position only occur in English, or can we observe a similar distinctive pattern in another language as well?** If the distinction between the two types of causation is not an idiosyncratic convention but a general cognitive pattern, we would predict that a similar pattern occurs in a language typologically distinct from English, such as Mandarin.

In Section 4, we will claim that the transitive verbs that occur in passive voice in the Locative Inversion Construction (henceforth Locative Inversion) also occur in the Caused-Position. This co-occurrence is not a coincidence, since the Caused-Position and Locative Inversion are semantically closely related constructions. Among the verbs that occur in both constructions, there are verbs that involve no motion of the theme (such as *write*), are compatible with dynamic prepositions (such as *write onto*), but nevertheless coerce a static reading. This justifies the coercion argument introduced in Section 1.

Furthermore, in Section 5, we will investigate whether the Caused-Position is polysemous, similarly to Caused-Motion. Since Goldberg has argued that Caused-Motion bears polysemous extensions (such as *X helps Y to move Z*), it would be interesting to see if Caused-Position has similar extensions as well, and if so, what verbs are instantiated in such extensions.

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Lastly, Section 6 is a corpus study demonstrating that similar PP collocations (Caused-Motion verbs with dynamic prepositions and Caused-Position verbs with static prepositions) occur in Mandarin as well. The fact that two typologically distinct languages show similar patterns adds further support to the claim that the distinction between the two constructions have general cognitive motivations.

4 Locative Inversion

4.1 Locative Inversion and Caused-Position

Various studies (Levin and Hovav 1995; Birner 1996, etc.) have found out that the verbs instantiated in Locative Inversion need to express either existence or appearance. Examples are shown in (4).

(4) a. In the room stood a man. (EXISTENCE)
   b. Into the room walked a man. (APPEARANCE)

This leads to most verbs being either intransitive or passive, because transitive verbs in active voice usually do not express existence or appearance (with exceptions such as take place, which does occur in Locative Inversion). Levin and Hovav (1995:245-246) have observed from their corpus study that the transitive verbs listed in (5) occur as passives within Locative Inversion.

(5) a. Verbs of putting: display, embed, heap, locate, place, put, range, situate, store, ...
   b. Verbs of putting in a spatial configuration: hang, lay, mount, perch, seat, suspend, ...
   c. Verbs of attachment: glue, hook, lace, paste, pin, staple, ...
   d. Verbs of image impression: engrave, imprint, inscribe, scrawl, scribble, stamp, write, ...
   e. Verbs of creation: build, carve, cook, erect, ...
   f. Verbs of perception: discern, glimpse, hear, realize, see, ...

We have illustrated the example of each verb type occurring in Locative Inversion as in (6).

(6) a. On the table was placed a book.
   b. On the chair was seated a lady.
   c. On the wall was pinned a poster.
   d. On the book cover was written a name.
   e. In the city was built a mansion.
   f. On the table was seen a letter.

(7) shows that the verbs occurring in (5) also occur in the Caused-Position.

   b. Verbs of putting in a spatial configuration: I seated a lady on the chair.
   c. Verbs of attachment: I pinned the poster on the wall.
   d. Verbs of image impression I wrote a name on the book cover.
   e. Verbs of creation: I built a mansion in the city.

Rohde has already argued that verbs of putting (PaP verbs) occur in Caused-Position and not Caused-Motion. Attachment Verbs are also a kind of PaP verbs (illustrating placement in specific manners). What is interesting is that (7a) has verbs that do not involve motion: verbs of image impression, creation, and perception. In (7a), the name is not "moved" onto the book cover. Yet it fits exactly into the definition of the Caused-Position: X causes Y (the name) to be positioned Z (on the book cover). Moreover, even if we replace the preposition in (7a) with onto, the sentence still yields a static reading: writing a name onto the book cover does not imply that one has "moved" the name from somewhere else onto the book cover. The instantiation of creation verbs within the Caused-Position adds support to Rohde’s theory that the Caused-Position does not entail motion and coerces a dynamic preposition into a static reading.

What may be confusing to the reader is (7f): seeing a letter on the table does not mean causing a letter to be on the table, so how could (7f) be an occurrence of Caused-Position? We argue that it is in fact an instance of Caused-Position by the virtue of the conceptual metaphor PERCEPTION IS EFFECTUAL ACTION as proposed by

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None of the sentences in (8) imply that the subject’s perception has literally caused the object’s movement in the oblique phrase. Yet, their Caused-Motion-like syntactic structure makes them likely to be instances of Caused-Motion. Del Campo Martínez explains that the abovementioned metaphor of effectual action licences (9) to be Caused-Motion, by “allow[ing] us to see perceptual activities as if they were effectual” (p. 194). In other words, the source domain of perceiver and the perceivee are mapped onto the target domain of causer and the causee. This may explain why they are syntactically expressed as transitive sentences in the first place.

Based on her argument, we can also argue that (9) is an instance of Caused-Position, where the verb see metaphorically illustrates the effectual action of positioning a letter on the table, and thereby conclude that verbs of perception appear metaphorically in both Caused-Motion and Caused-Position.

We thus make the following prediction: If a transitive verb occurs passively in Locative Inversion, then it also occurs in Caused-Position. Note that we do not claim the reverse, that a verb occurring in Caused-Position necessarily occurs in Locative Inversion, which may not hold.

The occurrence of the same verbs in Caused-Position and Locative Inversion is not a coincidence. As noted above, the verb employed in Locative Inversion must express either existence or appearance. Caused-Position, by definition, profiles the theme’s position (i.e. existence at a location) as the goal point. Caused-Motion, on the other hand, profiles a path towards a goal, which is not equivalent to existence (at a location).

4.2 Locative Inversion and Caused-Motion

The following question then arises: Why can’t Caused-Motion verbs in passive voice be employed in Locative Inversion by virtue of expressing appearance? For example, (10) expresses the appearance of a man who walks into the room. Walk is a motion verb. Thus, at first sight, it seems theoretically possible that Caused-Motion can also express appearance by motion within Locative Inversion.

In order to solve this problem, let us first note that Caused-Motion in passive voice within Locative Inversion is theoretically possible. For example, according to Birner (1996:108), (9) is grammatical.

(9) Into the yard was thrown a ball.

We have informally consulted a number of native speakers, and most agreed that (9) was acceptable, even though it sounds somewhat “poetic”. Why, then, are cases like (9) completely absent in the corpus of Levin & Hovav (8)?

The reason for this absence can explained by the fact that appearance by definition entails that only what appears (and not what makes it appear) comes into perception. Fukada (1996) illustrates the image schema of (physical) appearance as Figure 11 (She further argues that the image schema can be extended to metaphorical appearance as well).

In Figure 11, we see that only the trajector (tr) comes into the field of view (landmark: lm) and not the causer of the trajector’s movement. Based on this model, we claim the following: appearance entails that whatever caused the appearance must not be perceptually salient.

According to this claim, (9) is only acceptable if the ball but not the thrower is perceptually salient, i.e. in the (quite rare) circumstance where the ball thrown by someone is salient to the speaker but whoever throws it is not. The rarity of such situation explains why (9) does not occur in real language usage even though it is theoretically possible. This explanation is first supported by the fact that in most cases, agentative by-phrases are not allowed in Locative Inversion, as shown in (10).

Of course, absence in a corpus does not strictly imply unacceptability, incorrectness, or non-existence.
Thus, (10) is odd since Pam is syntactically present and therefore perceptually salient. The restriction against the salience of the cause of appearance is supported by the fact that most *Appear* Verbs listed by Levin (1993) (such as *appear*, *rise*, and *surge*) do not allow causative uses, as shown in (11).

(11) a. A dove appeared from the magician’s sleeve. (Levin 1993:48)
    b. *The magician appeared a dove from his sleeve.* (Levin 1993:48)

(11a) is acceptable because dove “magically” appears from the magician’s sleeve and what can be considered as the cause of the appearance is not perceptually salient. In (11b), however, the speaker knows that the magician is the person causing the dove to come out of his sleeve. This event can thus no longer be regarded as an “appearance”, which makes it felicitous with the very definition of the verb *appear*.

Similarly to appearance, which seizes to be “appearance” when its cause becomes salient, existence also seizes to be “existence” when whatever causes the existence becomes salient. Levin (1993), also listing *Exist* Verbs (e.g. *exist, live, stay*), confirms that they do not allow causative uses, as shown in (12).

(12) a. A solution to this problem exists.
    b. *The famous mathematician existed a solution to the problem.* (Levin 1993:250)

A transitive verb (like a PaP verb) can occur (in passive voice) unless the causer is salient. Thus, *by*-phrases are also odd in Locative Inversion where passive Caused-Position is employed, as shown in (13).

(13) Among the guests of honor was seated my mother by my friend Rose. (Bresnan 1994:79)

The oddity of (13) comes from the syntactic presence (and, as a result, the cognitive salience) of *my friend Rose*, the causer of the mother’s sitting. If we remove *by*-Phrase, however, the phrase is completely acceptable, as shown in (14).

(14) Among the guests of honor was seated my mother.

Caused-Position cases like (14) are frequent within the corpus of Levin & Hovav, unlike Caused-Motion cases like (9), which are absent. This is due to the fact that it is easy to only perceive what is caused to be positioned and not perceive what caused it to be positioned whereas it is difficult to only perceive what is caused to move without perceiving what caused it to move. In other words, it is easy to perceive a seated woman without having in mind whoever seated her, whereas it is difficult to perceive a thrown ball without perceiving whoever threw it.

In sum, Caused-Motion verbs do not occur in Locative Inversion, because it (i) it cannot express existence; and (ii) it (under normal circumstances) cannot express appearance without the cause of appearance also being perceptually salient. Caused-Position verbs can, however, express existence under the circumstance where the cause of existence is not perceptually salient.

Similarly, in Mandarin Chinese, motion verbs such as *bān* ‘to move’ do not allow Locative Inversion, while placement verbs (which encode caused-position) such as *fàng* ‘to place, put’ occur in Locative Inversion (Chen and Jing-Schmidt 2014; Liu and Chang 2015b).
4.3 Summary

So far, we have confirmed the distinction between Caused-Position and Caused-Motion by explaining why the former occurs in Locative Inversion whereas the latter does not. Thus, through the Locative Inversion diagnosis we can claim that the two constructions show different syntactic patterns, which are motivated by semantic differences. In other words, transitive verbs occurring in Locative Inversion also occur in Caused-Position because Caused-Position profiles position (i.e., existence at a location), whereas they do not occur in Caused-Motion because Caused-Motion profiles motion through a path, which normally entails the salience of the causer of the motion and therefore cannot be perceived as existence or appearance.

5 The Polysemy of the Two Constructions

In this section, we will investigate whether Caused-Position show similar polysemous patterns as Caused-Motion does. We claim that the polysemous extensions of the two constructions are remarkably similar but all express different Force-Dynamic patterns.

5.1 The Polysemy of the Caused-Motion

To argue for the constructional status of Caused-Motion, Goldberg claimed that Caused-Motion, other than its core meaning of ‘X causes Y to move Z’, can convey the following extended meanings (pp. 161-162):

(15) **Conditions of Satisfaction Imply**: The conditions of satisfaction associated with the act denoted by the predicate entail: ‘X causes Y to move Z’.
  a. Sam ordered him out of the house.
  b. Sam asked him into the room.
  c. Sam invited him out to her cabin.
  d. Sam beckoned him into the room.
  e. Sam urged him into the room.
  f. Sam sent him to the market.

(16) **Cause-Enable**: ‘X enables Y to move Z.’
  a. Sam allowed Bob out of the room.
  b. Sam let Bill into the room.

(17) **Cause-Prevent**: ‘X prevents Y from moving Comp(Z) (complement of the potential motion)’
  a. Harry locked Joe into the bathroom.
  b. He kept her at arm’s length.
  c. Sam barricaded him out of the room.

(18) **Cause-Aid**: ‘X helps Y to move Z’
  a. Sam helped him into the car.
  b. Sam assisted her out of the room.
  c. Sam guided him through the terrain.
  d. Sam showed him into the livingroom.
  e. Sam walked him to the car.

Furthermore, Goldberg pointed out that this polysemous network parallels with that of the Ditransitive Construction (‘X causes Y to receive Z’), which can be similarly extended to meanings such as ‘X enables Y to receive Z’ or ‘X prevents Y from receiving Z’. This parallel between two polysemous networks shows that they are not ad-hoc inventions, according to Goldberg, who claims that “patterns of polysemy recur, although not strictly predictably so” (p. 164).

Given the observation of del Campo Martínez (2013) that perception verbs also occur in Caused-Motion but only metaphorically so, it becomes also necessary to add this metaphorical extension into the polysemy schema. (19) shows the definition and the examples of the extension **Cause-Perceive**. The examples are modified versions of (8). We have also paraphrased them in italic to match the definition of Cause-Perceive.

(19) **Cause-Perceive**: ‘X perceives perceptual character of Y move Z’
a. Standing next to his wife giving birth, Sam saw his baby into the world. \( (\text{Sam, by seeing, perceived the sight of his baby move into the world.}) \)

b. Sam heard his name from the mouth of his dying father. \( (\text{Sam, by hearing, perceived the sound of his name move from the mouth of his dying father.}) \)

c. Sam felt her shoulders through her sweater. \( (\text{Sam, by feeling, perceived the feel of her shoulders move through her sweater.}) \)

d. Sam smelled the soap from her hair. \( (\text{Sam, by smelling, perceived the smell of the soap move from her hair.}) \)

e. Sam tasted the salt from the glass’s rim. \( (\text{Sam, by tasting, perceived the taste of the salt move from the glass’s rim.}) \)

Since Rohde made it clear that the Caused-Motion and Caused-Position are closely related constructions, it is highly likely that the polysemy of the Caused-Motion parallels that of the Caused-Position. We will illustrate how all the Caused-Motion polysemous extensions shown in \( (15 - 19) \) occur in Caused-Position as well. This will further add support the Rohde’s idea that Caused-Position is a full-fledged construction that must be distinguished from Caused-Motion.

### 5.2 The Polysemy of the Caused-Position

#### 5.2.1 Conditions of Satisfaction Imply

In Goldberg’s Caused-Motion model, it is made clear that stative verbs (such as \textit{want} or \textit{need}) are excluded from the Caused-Motion. But we have already shown that verbs of perception, which are also stative verbs, do occur in Caused-Motion. Furthermore, we will show that the stative verbs \textit{want} and \textit{need} occur in Caused-Position due to their semantic compatibility with the constructional meaning; specifically, they occur in Caused-Position’s polysemous extension of \textit{Conditions of Satisfaction Imply}. Consider \( (20) \).

\[ (20) \]

c. I want you in my office.

d. I need a TV in my room.

\( (20) \) exactly matches the definition of Caused-Position in that the PP expresses a goal point where the theme should end up being, and also the definition of the Conditions of Satisfaction Imply extension in that the satisfaction of \textit{want} and \textit{need} entails the position of the theme in the goal point. \( (20) \) cannot be explained in terms of Caused-Motion, for two reasons. First, the \textit{want} and \textit{need} do not allow dynamic paths as their PPs, but only static goal points. This is made evident by the fact that they generally do not collocate with dynamic prepositions, as we will show in Section 5.3.

Next, \( (20) \) does not necessarily entail any motion, even if what is wanted or needed is satisfied. \( (20a) \) can be interpreted as the speaker wanting the hearer to remain in the speaker’s office without moving, and \( (20b) \) can be the speaker stating that s/he wants the TV to remain in his/her room. Even though \( (20a-b) \) can illustrate cases where the hearer is ordered to come into the office or the TV is requested to move into the room, given the sentences’ non-compatibility with dynamic prepositions, such motions are better interpreted as pragmatic implications necessitated by the semantic definition of the hearer or the TV being positioned in the room, rather than the meaning of the two sentences per se.

Since \( (20) \) syntactically only allow static prepositions and semantically do not entail motion, it cannot be occurrences of the Caused-Motion. But the fact that it does not necessarily entail the actual position of the theme in the goal point (e. g. \( (20a) \) does not entail that the hearer will actually come to the office), it must be a polysemous extension of Caused-Position, i.e. The conditions of satisfaction associated with the act denoted by the predicate entail: ‘X causes Y to be positioned Z’.

#### 5.2.2 Cause-Enable

The verbs \textit{keep} and \textit{leave} elicit the Cause-Enable meaning of the Caused-Position. An example is shown in \( (21) \).

\[ (21) \] Leave the cake in the box! \( (\text{Talmy, 1988:66}) \)

\( (21) \) does not illustrate a case where the speaker demands the hearer to move the cake into the box. The cake is already in the box, and the hearer is demanded to let it remain there. The semantics of \( (21) \) is thus ‘X enables Y to be positioned Z’. In Talmy’s terms, \( (21) \) is equivalent to: ‘Let the cake be (keep being) on the box!’

This sense of the Caused-Position can be explained in Talmy’s (1988) theory of \textit{Force Dynamics}, where the stronger, agentive Antagonist allows the weaker, patientive Agonist to sustain its static tendency. This is
schematically illustrated as Figure 2, where “1” (labelled as the agent) is the Antagonist and “2” the Agonist. The Agonist has a tendency to rest, represented by its black dot, and the Antagonist, stronger than the Agonist (represented by its plus sign), allows the Agonist to stay static. The stative result is illustrated as the line under the circle, with a black dot representing the staticity and the ‘be’ representing that the Agonist ends up being at a place.

Figure 2: A Force-Dynamic schema of permitted staticity (Talmy, 1988:66)

In the light of this Force-Dynamic schema, it becomes clearer that the Cause-Enable of the Caused-Position is distinct from that of the Caused-Motion, since the former enables the static tendency of the object whereas the latter enables the dynamic tendency of the object.

5.2.3 Cause-Prevent

As for the Cause-Prevent extension, we argue that Cause-Prevent is not a semantic extension of the Caused-Motion, but actually part of the core meaning of Caused-Position.

First, the three verbs Goldberg took as examples in (17) are all compatible with static prepositions, as shown in (22).

(22)  
   a. Harry locked Joe in the bathroom.  
   b. He kept her at arm’s length.  
   c. Sam barricaded him outside the bathroom.

If (22a) were to be analyzed in the Goldbergian definition of ‘X prevents Y from moving Comp(Z) (complement of the potential motion)’, it would then be paraphrased as Harry prevented Joe from moving the complement of the potential motion of ‘in the bathroom’. This is difficult to understand, since in the bathroom does not suggest any potential motion. It follows then the Caused-Motion coerces in the bathroom into the dynamic reading of ‘into the bathroom’. Such coercion is unlikely, given that the verb lock occurs far more frequently with in than into, as we will show in Section 5.3.

Lastly, by the virtue of Occam’s razor, explaining (22) as part of the core meaning of Caused-Position is favorable compared to explaining it in terms of a seemingly counter-intuitive polysemous extension of Cause-Prevent. This reduces the need for one polysemous extension. It would, however, imply revising Goldberg’s theory on the overlap between the polysemies of Caused-Motion and Ditransitive Construction, namely that the Cause-Prevent of Caused-Motion parallels the Cause-Prevent of Ditransitive Construction. This would not be a big problem, since constructional polysemy do not strictly predictably recur, as Goldberg has also stated. One polysemous extension of a construction not occurring in the other would not falsify that the two polysemous schemata largely overlap. All in all, explaining (22) as Caused-Position results in less theory with better explanation.

Based on Talmy’s Force Dynamics theory, we can illustrate (22) by Figure 3, which Talmy takes (23) as an example of.

(23) The ridge kept the log on the incline. (Talmy, 1988:66)

In (23) the log has an inherent tendency to move, and the ridge keeps it at a static position. Likewise, in (17), the direct objects have a tendency to move, but the subjects keep them at a static position. We can thus classify (17) as cases of the schema of Figure 3. And since the resulting state of this schema is staticity, we can classify the schema as part of Caused-Position rather than part of Caused-Motion.
5.2.4 Cause-Aid

Verbs such as *hide* or *seat* can be used in the Caused-Position with an animate direct object in the sense of Cause-Aid, i.e., ‘X helps Y to be positioned Z.’ (24) illustrates such examples.

(24)  
   a. The woman hid the man in her house.  
   b. The man seated the woman on the chair.

In (24a), it is the man who actually carries out the action of hiding, and the woman only helps him to do so. Likewise, in (24b), the man only helps the sitting action, and the woman is the one who actually sits on the chair.

5.2.5 Cause-Perceive

We have already discussed in Section 4.1 that verbs of perception occur both in Caused-Motion and Caused-Position. It is, however, more difficult to identify a Cause-Perceive extension of Caused-Position than that of Caused-Motion. Consider (25).

(25)  
   a. I saw the woman into the car.  
   b. I saw the woman in the car.

(25b) is difficult to judge as Caused-Position because the *woman in the car* can itself be interpreted as an independent NP (i.e., woman sitting in the car), whereas *the woman into the car* in (25a) cannot be interpreted as a stand-alone NP, leaving no difficulty for interpreting (25a) as Caused-Motion.

A way of identifying occurrences of Cause-Perceive extension of Caused-Position would be to first find occurrences of Locative Inversion with verbs of perception and then rephrase those into the Caused-Position form, since we have already argued that if a verb occurs passively in Locative Inversion, then it occurs in Caused-Position. (26) shows some examples of such Locative Inversion, again from COCA, which we converted into Caused-Position.

(26)  
   a. On the altar are seen the large bronze heads […] → Sam saw the large bronze heads on the altar.  
   b. In the quiet is heard the stuttering, clattering song of the sparrow. → Sam heard the sturring, clattering song of the sparrow in the quiet.

We couldn’t find any verbs of tactile, gustatory, or olfactory perception appearing in Locative Inversion, which makes it difficult to judge whether they appear in Caused-Position at all.

5.3 PP-collocation of polysemous Caused-Position Verbs

In this section, we have presented several verbs that we claim to appear in Caused-Position and not Caused-Motion (*want*, *need*, *leave*, *keep*, *lock*, *barricade*, *hide*, and *seat*). It thereby follows that these verbs, like PaP verbs analyzed by Rohde (2001), must significantly prefer static prepositions over dynamic ones.

We test this hypothesis through a brief corpus analysis of COCA. The hypothesis is that the abovementioned verbs will more frequently collocate with the static prepositions *in/on* than with their dynamic counterparts *into/onto*, compared to how the three verbs *move*, *push*, and *kick*, arguably prototypical Caused-Motion verbs, collocate with these four prepositions.

In COCA, we searched for frequency of the following search per each verb:
(27) **verb ART NOUN preposition ART NOUN**

where **verb** is the corresponding verb, **preposition** the corresponding preposition (in/into/on/onto), **ART** any article, and **NOUN** any noun. Among the verbs, *barricade* was excluded because it occurred 0 time as (27).

Table 4 shows the frequencies of the collocations and the quotient of $\frac{\text{into}}{\text{on}}$ and $\frac{\text{onto}}{\text{onto}}$ (rounded into three digits after decimal).

<table>
<thead>
<tr>
<th>Verb</th>
<th>in</th>
<th>into</th>
<th>Quotient</th>
<th>on</th>
<th>onto</th>
<th>Quotient</th>
</tr>
</thead>
<tbody>
<tr>
<td>want</td>
<td>360</td>
<td>5</td>
<td>0.014</td>
<td>232</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>need</td>
<td>232</td>
<td>2</td>
<td>0.009</td>
<td>113</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>leave</td>
<td>1512</td>
<td>6</td>
<td>0.004</td>
<td>1015</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>keep</td>
<td>1441</td>
<td>3</td>
<td>0.002</td>
<td>2753</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>lock</td>
<td>101</td>
<td>17</td>
<td>0.168</td>
<td>30</td>
<td>5</td>
<td>0.167</td>
</tr>
<tr>
<td>hide</td>
<td>374</td>
<td>1</td>
<td>0.003</td>
<td>29</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>seat</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Median</td>
<td></td>
<td></td>
<td>0.004</td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>move</td>
<td>128</td>
<td>179</td>
<td>1.398</td>
<td>61</td>
<td>20</td>
<td>0.328</td>
</tr>
<tr>
<td>push</td>
<td>114</td>
<td>453</td>
<td>3.974</td>
<td>148</td>
<td>33</td>
<td>0.223</td>
</tr>
<tr>
<td>kick</td>
<td>106</td>
<td>50</td>
<td>0.472</td>
<td>13</td>
<td>4</td>
<td>0.308</td>
</tr>
<tr>
<td>Median</td>
<td></td>
<td></td>
<td>1.398</td>
<td></td>
<td></td>
<td>0.308</td>
</tr>
</tbody>
</table>

The medians of the quotients of Caused-Position verbs (0.004 and 0) are much lower than the medians of the quotients of Caused-Motion verbs (1.398 and 0.308). In other words, the verbs we have claimed to be Caused-Position verbs show a great preference for *in/on* as opposed to *on/onto*, compared to the three Caused-Motion verbs. This further strengthens our claim that the verbs shown in this section to be part of the Caused-Position polysemy only occur in Caused-Position and not in Caused-Motion (except for the verbs of perception, which occur in both constructions), given that these verbs show a high preference for static prepositions like PaP verbs do. When they do collocate with dynamic prepositions, the Caused-Position coerces them into a static reading, as *Rohde* (2001) has claimed for the case of PaP verbs as well.

### 5.4 Summary

In this section, we have seen that Caused-Position allows several polysemous extensions equivalent to those of Caused-Motion. Furthermore, some of these extensions can be classified in terms of Force-Dynamic patterns. In Table 5 we see that two constructions, with their semantic extensions, complement each other, in the sense that they fill in the four possible Force-Dynamic “slots” given the two options of forced \*v. permitted and of towards motion \*v. rest.

<table>
<thead>
<tr>
<th></th>
<th>Forced</th>
<th>Permitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motion</td>
<td>I pushed him into the room.</td>
<td>I allowed him into the room.</td>
</tr>
<tr>
<td>Rest</td>
<td>I locked him in the room.</td>
<td>I left him in the room.</td>
</tr>
</tbody>
</table>

### 6 Caused-Motion and Caused-Position in Mandarin

In this last part of our study, we will demonstrate that a similar distinction between Caused-Motion and Caused-Position can be found in Mandarin, a language typologically distant from English, based on a corpus analysis of PP collocations. Specifically, we wish to test if the Mandarin Caused-Motion verbs and Caused-Position verbs show preference for the two prepositions 在 *zài* ‘at’ and 到 *dào* ‘to’.

#### 6.1 Background

Previous literature has extensively studied placement verbs in Mandarin (*Liu* 2003; *Cheng* 2008; *Lu* 2011; *Chen* 2012; *Liu and Chang* 2015; 2018). Examples of Mandarin placement verbs include 放 *fàng* ‘to put’, 挂 *guà* ‘to
hang’, 存 cún ‘to store’, 摆 bǎi ‘to place’, and 装 zhuāng ‘to load/fill’. Mandarin placement verbs all collocate with a locative phrase, which either precedes the verb (preverbal) or follows it (postverbal).

Li and Thompson (1981:404) observe that Mandarin verbs of placement subtly differ from verbs of displacement. Verbs of displacement such as 扔 rēng ‘toss’ or 推 tuī ‘push’ describe the movement from one location to another. They collocate with a directional phrase beginning with the preposition 到 dào ‘to’ and not a locative phrase beginning with the preposition 在 zài ‘at’. (28) illustrates that 搬 bān ‘move’, a verb of displacement, occurs with a directional phrase led by dào but not with a locative phrase led by zài.

(28) 我把杂志搬到书架上。
wǒ bā zázhì bān dào/zài shūjià shàng.
I BA magazine move to/at bookcase on
‘I moved the magazines to the bookcase.’

Thus, verbs of displacement, which are caused-motion verbs, semantically require a directional phrase (dào-phrase) and not a locative phrase (zài-phrase). This difference in verb-preposition collocation suggests a distinction between Caused-Motion with a directional path and Caused-Position with a locative ground.

6.2 Hypothesis

It is then predicted that Mandarin Caused-Motion verbs will more often collocate with dào ‘to’ whereas Mandarin Caused-Position verbs will more often collocate with zài, parallel to how English Caused-Motion verbs prefer to collocate with dynamic prepositions while English Caused-Position verbs prefer to collocate with static prepositions.

6.3 Methodology

To verify the abovementioned hypothesis, we employ the existing classification of Mandarin verbs in Mandarin VerbNet (Liu and Ye 2020, http://verbnet.lt.cityu.edu.hk). Mandarin VerbNet is a web resource that analyzes, annotates, and categorizes the lexical classes of Mandarin verbs from a frame-based constructional approach, using corpus data from Chinese Gigaword (Huang et al., 1996) for semantic and constructional annotation. It resembles the English FrameNet (Baker et al., 1998) in specifying frame-related information while providing constructional patterns as structural criteria for defining each semantic frame. It aims to offer deep annotations of semantic and syntactic properties for Mandarin verbs and verb classes along a hierarchical scheme of frames that may consist of Archi-frame, Primary frame, Basic frame, and Micro-frame. For details, cf. Liu and Chiang (2008), Liu and Chang (2018), Liu and Ye (2020).

The Mandarin VerbNet contains a list of Caused-Motion verbs in Mandarin. It labels Caused-Motion as the “Archi-Frame”, i. e. the largest scope of frames equivalent to a semantic domain, which is further divided into various “basic frames”, as shown in table 6.

<table>
<thead>
<tr>
<th>Frame</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARRY</td>
<td>带 dài ‘carry’</td>
</tr>
<tr>
<td>CAUSED-TO-MOVE</td>
<td>移 yí ‘move’</td>
</tr>
<tr>
<td>PLACE</td>
<td>摆 bǎi ‘put’</td>
</tr>
<tr>
<td>PLACE-CONTAINER</td>
<td>藏 cáng ‘hide’</td>
</tr>
<tr>
<td>PLACE-SURFACE</td>
<td>抹 mǒ ‘smear’</td>
</tr>
<tr>
<td>RELEASE</td>
<td>释 shì ‘release’</td>
</tr>
<tr>
<td>THROW</td>
<td>投 tóu ‘throw’</td>
</tr>
</tbody>
</table>

We have argued throughout the paper that verbs expressing placement, such as ‘put’ or ‘hide’, are instantiated in Caused-Position and not Caused-Motion. Thus, among the frames listed in table 6, PLACE, PLACE-CONTAINER, and PLACE-SURFACE should be classified as verbs of Caused-Position rather than those of Caused-Motion. And if the association between Caused-Position and static preposition and between Caused-Motion and dynamic preposition in English is not limited to English but has a general cognitive motivation, we would expect that a similar pattern would be found in the Mandarin verbs of Table 6.

The most common spatial prepositions in Mandarin are zài ‘at’ and dào ‘to’, expressing static position and dynamic path, respectively. The prediction is thus that Mandarin verbs compatible with Caused-Motion (those
listed in Mandarin VerbNet under the Archi-Frame of Caused-Motion other than the verbs of placement) will show a preference for dào ‘to’ whereas the placement verbs will prefer zài ‘at’.

In order to test this prediction, we first selected sample verbs to count the number of occurrence of. Among the verbs of VerbNet, only monosyllabic verbs were selected as the sample and disyllabic compounds were excluded, since many of them can overlap with the occurrences of the monosyllabic verbs. For example, the occurrences of 摆 bǎi ‘to place’ overlap with the occurrences of 摆放 bǎifàng ‘to lay out’. The verb 放 fàng ‘to put, release’ was also excluded, because it is labeled as both the frame place (which belongs to Caused-Position) and the frame release (which belongs to Caused-Motion).

Next, we have searched for the number of occurrences of each sample verb within the strings (29) from the BCC Corpus (Kun et al., 2016).

(29) a. bǎ * verb zài
   b. bǎ * verb dào

Where bǎ is the accusative-marking preposition. We specifically target the construction (29) because in Mandarin, postverbal locative PPs generally denote the endpoint of the event, whereas preverbal location PPs generally denote the location of the event, as exemplified in (30).

(30) 他 在 桌子 上 写 字 (PREVERBAL)
   tā zài zhuōzi shàng xiě zì
   he at table on write character
   ‘He wrote characters (on a piece of paper) at the table.’

Next, it was necessary to know the overall frequency of zài and dào in the construction (29). In order to find out this frequency, we searched for the two strings (31), where “v” equals any verb.

(31) 他 把 字 写 在 桌子 上 (POSTVERBAL)
   tā bǎ zì xiě zài zhuōzi shàng
   he BA character write at table on
   ‘He wrote the characters on the surface of the table.’ (Tai, 1975:156).

An example of the searches of (29) is shown in figure 4.

Figure 4: First 10 entries for the search of 把带到 bǎ * dài dào ‘take * to’

Next, according to Liu and Chang (2015a), 放 fàng ‘to put’ is polysemous with two distinct but related meanings: (i) ‘to place’ as in 我把画放出来 wǒ bǎ huà fàng chūlái ‘I put the painting out (for display),’ and (ii) ‘to release’ as in 我把狗放出来 wǒ bǎ gǒu fàng chūlái ‘I released the dog (from a cage).’ With the releasing sense, it profiles the object’s departure a source, while the placing sense profiles its landing at a location.

The BCC corpus consists of different subtypes such as literature or journalism. We chose the subtype “multi-domain” (多领域 duōlǐnɡyù) to control for the source bias.

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Figure 5: PP-collocations of Caused-Motion verbs.

*, FDR < 5% (zài ‘in’ < dào ‘to’); !, FDR < 5% (zài ‘in’ > dào ‘to’)

<table>
<thead>
<tr>
<th>Verb</th>
<th>Preposition</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>dai ‘carry’</td>
<td>dào ‘to’</td>
<td>*</td>
</tr>
<tr>
<td>reng ‘throw away’</td>
<td>zài ‘in’</td>
<td>*</td>
</tr>
<tr>
<td>la ‘pull’</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>tui ‘push’</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>diu ‘put aside’</td>
<td></td>
<td>!</td>
</tr>
<tr>
<td>bao ‘relocate’</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>li ‘carry’</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>pao ‘cast’</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>yi ‘move’</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>tuo ‘drag’</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>tou ‘throw’</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>shuai ‘fling’</td>
<td></td>
<td>!</td>
</tr>
<tr>
<td>bei ‘carry on back’</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>kang ‘carry on shoulders’</td>
<td></td>
<td>!</td>
</tr>
<tr>
<td>nuo ‘shift’</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>qian ‘move’</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>zhí ‘toss’</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>gun ‘roll’</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>xie ‘carry’</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>shi ‘release’</td>
<td></td>
<td>!</td>
</tr>
<tr>
<td>dao ‘to’</td>
<td></td>
<td></td>
</tr>
<tr>
<td>zài ‘in’</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on this data, we conducted a two-tailed binomial test for each verb, the hypothesized probability of success being the number of occurrence of (31b) divided by the sum of the numbers of occurrence of (31a) and (31b), i.e. $\frac{125574}{160215 + 125574}$. The number of successes was the occurrence of (31b) per each verb. The verb shì ‘to wipe’ was excluded from the binomial test because it occurred 0 time in (31a) and (31b). The binomial tests of Caused-Motion verbs and those of Caused-Position verbs were controlled for multiple comparisons by the Benjamini-Hochberg Procedure (Benjamini and Hochberg, 1995) at the False-Discovery Rate (FDR) of 5%.

### 6.4 Results

Figure 5 shows the PP-collocation of each Caused-Motion verb, whereas Figure 6 shows that of each Caused-Position verb. We see that 13 out of 20 Caused-Motion verbs significantly prefer dào over zài (marked with *), only one verb showing the opposite preference (marked with !). As for the Caused-Position verbs, 25 out of 33 of the verbs show preference for zài, with only 5 verbs preferring dào. From these results, it becomes clear that Caused-Motion verbs tend to be collocated with the dynamic preposition dào, whereas the Caused-Position verbs tend to be collocated with the static preposition zài, which parallels the pattern we have observed in English.

The fewer occurrences of incongruous mappings can partially be explained by the polysemy of the tested verbs. For example, dái can be used in the two senses shown in (32):

(32) a. 帶到学校
dái dào xuéxiào
‘carry to school’
b. 帶在手上
dài zài shǒu shàng
‘carry in hand on’

The dái in (32a) and (32b) are semantically different: the former means ‘move something to a location by
Figure 6: PP-collocations of Caused-Position verbs.

\* FDR < 5% (\textquote{zài ‘in’} > \textquote{dào ‘to’}); !, FDR < 5% (\textquote{zài ‘in’} < \textquote{dào ‘to’})

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Caused-Motion and Caused-Position

holding it’, whereas the latter means ‘keep holding something’. In the latter sense, dǎi is a Caused-Position verb (since it refers to placing something onto one’s hand) and it is not surprising that it is collocated with zài.

6.5 Summary

Our corpus study shows that the Mandarin verbs and prepositions in Caused-Motion and Caused-Position collocate in a way similar to English. This comparative analysis suggests that the PP collocation patterns in English Caused-Motion and Caused-Position are not merely conventionalized rules but cognitive strategies to pair semantically compatible lexemes to each other.

7 Discussion

In this paper, we have seen that there exist verbs other than PaP verbs that are compatible with Caused-Position, notably those that do not entail any motion. We further discovered that the transitive verbs in passive voice appearing in Locative Inversion are also compatible with Caused-Position, which confirms Caused-Position profiles a static position as its endpoint. Moreover, Caused-Position has several polysemous extensions that parallel with those of Caused-Motion. And it is shown that these extensions cannot be explained within the model of Caused-Motion but must be explained within Rohde’s Caused-Position model. The semantic difference and the polysemous extensions proposed in this study further verify the existence of Caused-Position and clarifies its distinction from Caused-Motion. Lastly, the Mandarin PP collocation patterns that closely parallel with the English patterns demonstrate that this distinction is not limited to English and may apply to typologically distinct languages such as Mandarin. Although the sample of two languages is far too scarce to make a general typological claim, it calls for future studies to investigate whether similar patterns occur in other languages as well, which may add further support to our prediction that this distinction is based on human cognitive biases rather than idiosyncratic language rules.

8 Conclusion

Our initial big question was how to distinguish one unit (construction) from another. We have shown through a case study on two closely related yet clearly distinct constructions that this distinction should be made through analyzing the syntactic patterns and the semantic networks of the lexemes occurring in a given construction. In other words, it is not enough to only analyze the construction per se but also required to thoroughly analyze the lexemes that occur within them, how they behave syntactically (e. g. do they co-occur with certain lexemes?) and semantically (e. g. how are the lexemes occurring in the same construction semantically related to each other?). It was Rohde [2001] who used such a methodology to bring Caused-Position into our attention, and we have hereby proven that she was right, and that her idea can be extended beyond what she initially may have designed it for. Even though her thesis received virtually no attention for nearly two decades following its completion, we thus confirm that her idea, which we elaborated in this paper, can further clarify and strengthen the theory of Goldbergian CxG.

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