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Paths across worlds: the presupposition of *back* in intensional contexts

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Abstract

This paper describes a novel pattern of infelicity involving the English adverb 'back', which is incompatible with nonreferential direct objects of intensional transfer-of-possession verbs (including 'offer' and 'promise'). This pattern is argued to arise from an identity condition in the meaning of counterdirectional 'back', with its apparent world-sensitivity arising not from genuine intensionality, but from inferences facilitated by the circumstantial modal. This correctly predicts the felicity of 'back' in a restricted subset of intensional cases. Discussion follows regarding a "proxy relation" which licenses exceptions to the identity condition, as well as a distinct pattern of infelicity observed with the adverb 'again'.

Keywords paths, back, counterdirectionality, transfer-of-possession verbs, intensionality, circumstantial modality

1. Introduction

The English adverb *back* shows a surprising pattern of infelicity when combined with intensional transfer-of-possession verbs such as *offer* or *promise*. In such cases, well-formedness appears to be determined by the interpretation of the theme argument. When the offer/promise can only be fulfilled by the transfer of a specific individual, as in (1), modification by *back* is felicitous. When the offer/promise can be satisfied by transferring any individual with a certain property, as in (2), the use of *back* is infelicitous.[1]

(1) CONTEXT: *Emma forgot to buy wine for her dinner party. She went next door and asked her neighbor Frank, who gave her two bottles. During the party, Emma and her guests only opened one, so she texted Frank and offered to return the unopened bottle in the morning.*

Emma offered Frank a/the bottle of wine back.

[1] Note that (2) may be marginally acceptable for some speakers under an alternative "responsive" reading for *back*, paraphrasable as *in return*. See Section 2.

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(2) CONTEXT: *Emma forgot to buy wine for her dinner party. She went next door and asked her neighbor Frank, who gave her a bottle. Emma was grateful, and offered to buy him another bottle to replace it.*

Emma offered Frank a bottle of wine (#back).

This gives the superficial impression that *back* might itself be intensional, as it seems in some way sensitive to whether or not the theme argument is consistent across the possible worlds over which the verb quantifies. This is a red herring. I will argue that the contrast between (1) and (2) can be captured by employing a (purely extensional) counterdirectional meaning for *back*, following Zwarts (2019); Iyer (2023), in which case the apparent intensionality of *back* arises from an interaction between three factors: the presupposition of *back* (i) requires that the theme argument be identical to one previously transferred, (ii) is evaluated separately within each world in the domain of quantification, and (iii) is evaluated relative to a consistent set of facts which are shared (in virtue of the circumstantial modal base) by the world of evaluation and all worlds in the domain of quantification.

This paper is organized as follows. Section 2 provides background on the mnemonically-named "*re* domain" framework of Zwarts (2019), which I take as a starting point for the meaning of counterdirectional *back*. Section 3 outlines the key pattern in more detail. Section 4 provides the formal details of this account: I argue that the meaning of *back* explicitly tests the identity of the themes of the asserted and presupposed events, assume a decompositional semantics for transfer-of-possession verbs, and discuss the entailments that arise from the circumstantial modal base. Section 5 discusses an important prediction: provided an appropriate contextual restriction, certain intensional examples are well-formed. Section 6 addresses several outstanding issues, and Section 7 concludes.

2. Background: polysemy and the *re*-domain

In the discussion that follows, it will be important to distinguish several readings of English *back*. To do so, I follow the descriptive framework of Zwarts (2019), who describes a set of (at least) six conceptually-related meanings pertaining to repetition and reversal, referred to mnemonically as the "*re* domain". This domain includes the well-described REPETITIVE reading of *again* (as in von Stechow, 1996), as well as five additional meanings expressed in English by the adverb *back* and its partial synonyms *backward(s)* and *in return*.[2]

Of primary relevance are two readings that might both be called "restitutive" by other authors: the RESTITUTIVE and RETURNATIVE senses. These are both counterdirectional meanings, which involve the reversal of some prior change or development (as in Fabricius-Hansen 2001; Pedersen 2015; Patel-Grosz and Beck 2014, 2019; Beck and Gergel 2015; Iyer 2023, a.o.). Zwarts reserves the term RESTITUTIVE for cases involving reversal of scalar change, and coins the term RETURNATIVE for cases involving reversal of motion through space.

For reference, the full list of *re*-domain readings is given in (3), including the remaining three readings: RESPONSIVE (done in response to another action), REARWARD (with the subject's back leading), and RETROGRADE (opposite to a canonical direction).

(3) Readings of the *re*-domain (terminology Zwarts 2019, examples mine)

[2] There is considerable synchronic and diachronic variation in how languages parcel out these readings. As Zwarts describes, *terug* 'back, again' has the last four readings in (3) in Standard Dutch, and all six in Belgian Dutch. In present-day English, *again* has only a single productive sense, though historically its use has included the first four readings in (3) (Beck and Gergel, 2015; Gergel and Beck, 2015).

a. REPETITIVE:
(Yesterday, John danced.) Today, John danced **again**.

b. RESTITUTIVE:
(John closed the door.) Mary pushed the door **back** open.

c. RETURNATIVE:
(John walked to the store, and then) John walked **back** home.

d. RESPONSIVE:
(Mary insulted John.) John glared **back** at her/glared at her **in return**.

e. REARWARD:
Mary took a step **back**./Mary walked **backwards**.

f. RETROGRADE:
John counted **back**/**backwards** from 100.

Because the term "restitutive" has been used differently by different authors, there may be some terminological confusion. To limit this, I will stick as closely as possible to Zwarts's naming scheme, which has a one-to-one correspondence between terms and denotations: RESTITUTIVE for counterdirectional scalar change, RETURNATIVE for counterdirectional physical motion, and REPETITIVE for both readings addressed in von Stechow's (1996) classic analysis of the *again* ambiguity. (Where it becomes necessary, I will disambiguate between different scope sites for a single denotation by using descriptive terms, for example "high repetitive" and "low repetitive".)

For the present analysis, the two most relevant meanings are the counterdirectional RESTITUTIVE and RETURNATIVE. In formally characterizing these, Zwarts relies crucially on the notion of a path: a representation of movement or development over the course of an event. In fact, the denotations for these two readings, given in (4), differ only in the type of path to which they are sensitive: the RESTITUTIVE reading of *back* involves reversal of change along a scalar path (SPATH), while the RETURNATIVE reading involves reversal of movement along a locational path (LPATH).

(4) *Two counterdirectional readings* (Zwarts, 2019)

a. $[\![\text{RESTITUTIVE}]\!] = \lambda E \lambda e : \exists e'[e' < e \wedge E'(e') \wedge \text{REVERSE}(\text{SPATH}(e), \text{SPATH}(e'))].[E(e)]$

b. $[\![\text{RETURNATIVE}]\!] = \lambda E \lambda e : \exists e'[e' < e \wedge E'(e') \wedge \text{REVERSE}(\text{LPATH}(e), \text{LPATH}(e'))].[E(e)]$

These readings are otherwise identical. Both take as their arguments a property of events E and an event e, both presuppose that there exists some event e' previous to e with the property given by the contextual variable E', and both presuppose that the path associated with e is the reverse of the path associated with e'. That is: both require a previous event with change/movement in the reverse direction.

The predicate REVERSE carries much of the explanatory power here, in that it is responsible for comparing (the orientation of) the two paths. Understanding precisely how REVERSE accomplishes this will require a much more detailed examination of the formal architecture by which paths are modeled, which I will defer until Section 4. For the present, an intuitive notion of "reversal" will suffice, though REVERSE may be slightly more permissive than intuition suggests.

Given that we have multiple counterdirectional readings available, which reading ought to apply to transfers of possession? In the substantial literature on the "dative alternation" of transfer of possession verbs, it is well known that the two possible argument frames carry different meanings: the double-object frame encodes a possessive relation, and the DP–PP frame encodes a locative relation (Green, 1974; Larson, 1988; Harley, 2002; Beck and Johnson, 2004, a.o.). Assuming this corresponds to a contrast in the type of path involved,

both RETURNATIVE and RESTITUTIVE meanings may be valid choices. See section 6.3 for additional discussion of this point.

For ease of exposition, I will remain agnostic about precisely which type of path is involved in each case, making use of the generic denotation for *back* given in (5). This meaning, to be modified, includes an underspecified PATH function and thereby encompasses both readings in (4) above.[3]

(5) $[\![\text{back}]\!] = \lambda E \lambda e : \exists e'[e' < e \wedge E'(e') \wedge \textsc{reverse}(\textsc{path}(e), \textsc{path}(e'))].[E(e)]$

Of necessity, the discussion in this section has been kept rather brief. The reader is encouraged to refer to Zwarts 2019 for further examples and detailed discussion of the truth conditions associated with these various readings.

3. Data

In this section, I present data illustrating an interaction between counterdirectional *back* and intensional transfer-of-possession verbs like *offer* and *promise*. Specifically, I show that *back* is infelicitous in combination with intensional transfer-of-possession verbs that take nonspecific direct objects.

For present purposes, the most salient difference between these verbs and their extensional counterparts (including *give*, *send*, and others) is the property of existential import of the object. All else being equal, verbs like *give* and *send* give rise to propositions that entail the existence of the object. For example, in a scenario where (6a) is true, there must exist a particular book that was given. Likewise, if (6b) is true, there must exist a letter that was sent.

(6) Extensional transfer-of-possession verbs:
   a. Mary gave John a book. → There exists a book that M gave J
   b. Josephine sent Monty a letter. → There exists a letter that J sent M

Verbs like *offer* and *promise* behave differently. Though they may give rise to such an entailment in certain contexts (e.g., when the object refers to a unique, salient individual in the common ground), they do not give rise to such an entailment in the general case. We cannot conclude from (7a) that there exists a particular cup of tea that was promised. (In fact, it's quite natural to assume that no cup of tea has yet been prepared.) Likewise, (7b) need not relate to any particular bicycle. These obligations might be fulfilled by the transfer of any arbitrary individual, so long as it has the relevant property.[4]

(7) Intensional transfer-of-possession verbs:
   a. George offered Harriet a cup of tea. ↛ There exists a cup of tea that G offered H
   b. Peter promised Lucy a bicycle. ↛ There exists a bicycle that P promised L

[3] Iyer (2023) has argued that the various senses of counterdirectional *back* are represented in the lexicon with a single denotation much like this one; however, lexicalization patterns in Standard Dutch (Zwarts, 2019) and perhaps also English (see section 6.3) suggest these remain separate readings in at least some languages.

[4] Other properties that differentiate intensional transfer-of-possession verbs from their extensional counterparts include the criteria proposed by Moltmann (1997): (i) lack of anaphora support, (ii) the use of impersonal pro-forms, and (iii) identity conditions. Here # indicates infelicity under the intensional reading.

(i) George offered Harriet a cup of tea. He offered {one / #it} to Josephine too.

(ii) The boss offered John {something / #someone}: a new assistant.

(iii) The boss offered John {the same thing / #the same person} I offered Mary: a new assistant.

Although such intensional transfer-of-possession verbs do not generally entail the existence of their object, they may do so in certain contexts. As a convenient shorthand, I will use descriptive terms to differentiate event descriptions on that basis. For example, a "specific promise" is a *promising* event for which there exists a single individual capable of fulfilling it. In contrast, a "nonspecific promise" is a *promising* event for which there does not exist such an individual: that is, a promise that can be fulfilled by any individual with a particular property.

With that in mind, we can now consider the pattern alluded to by examples (1–2) in Section 1.[5] For specific promises/offers, the meaning is relatively unsurprising. For example, the context of (8) is such that the offer pertains to a particular bottle. Either a definite or indefinite object is felicitous in this context, and in both cases the object DP is interpreted as referring to a particular individual that already exists. (Though the choice of definite or indefinite article may carry certain implications, for example that the speaker knows or is ignorant of the identity of the bottle in question.)

(8) CONTEXT: *Emma forgot to buy wine for her dinner party. She went next door and asked her neighbor Frank, who gave her two bottles. During the party, Emma and her guests only opened one, so she texted Frank and offered to return the unopened bottle in the morning.*

a. Emma offered Frank the bottle of wine back.

b. Emma offered Frank a bottle of wine back.

The same can be seen in (9): *back* can appear in combination with a specific object of an intensional transfer of possession verb. Whether that object appears with a definite or indefinite determiner does not affect the felicity of the sentence.

(9) CONTEXT: *Ben gave Ann three textbooks, but afterwards realized that he still needed one of them. Ann promised to return that textbook as soon as she could.*

a. Ann promised Ben the textbook back.

b. Ann promised Ben a textbook back.

In these cases, the behavior of *promise* and *offer* simply resembles the behavior of extensional verbs like *give* and *send*.

When the object is nonspecific, however, we see a different pattern. The nonspecific offer in (10) could be satisfied by the transfer of any bottle of wine. Unlike the specific offer in (8) above, this offer is incompatible with the use of the adverb *back*.

(10) CONTEXT: *Emma forgot to buy wine for her dinner party. She went next door and asked her neighbor Frank, who gave her a bottle. Emma was grateful, and offered to buy him another bottle to replace it.*

Emma offered Frank a bottle of wine (#back).

This is somewhat surprising. We can easily conceive of the offer in (10) in terms that broadly align with the meaning of counterdirectional *back*. To fulfill this offer, a bottle of

[5] Judgments in (8–11) are from an informal survey of 13 native English speakers (7 linguists, 6 non-linguists). Ratings were given on a 6 point Likert scale, with a mean rating < 2.5 indicated here as infelicitous (#), 2.5–4.5 as marginal (?), and ≥ 4.5 as felicitous (except for example (10); see discussion below). 8 items were presented in a randomized order, in a $2 \times 2 \times 2$ design, varying the direct object (referential vs. non-referential), verb (*offer* vs. *promise*), and adverb (*back* vs. *again*). Examples with *again* do not share this pattern and are omitted. Examples with definite objects are added here for comparison.

wine must travel from Emma to Frank, the exact reverse of the path previously traveled by a bottle of wine in context. Yet the adverb *back* cannot felicitously apply.

The same holds for (11), which, if Dan's promise is fulfilled, will result in a goldfish being transferred to Christie (who a goldfish was previously transferred from). Again, the relation between the two events seems to be precisely that which *back* describes, and again the adverb *back* cannot felicitously apply.

(11) CONTEXT: *Christie won a pet goldfish at the carnival, but it died only a few days afterward. Seeing how disappointed she was, her boyfriend Dan promised that he would get her a new goldfish.*

Dan promised Christie a goldfish (#back).

There is one complication here that should be noted. Some speakers may find (10) to be marginally felicitous under an alternative reading of *back*: the so-called RESPONSIVE reading mentioned in Section 2. This reading, which can be paraphrased as *in return*, conveys that an action is done in response to another action involving the same participants. This reading, which I discuss further in Section 6.2, does not evaluate literal movement or change; rather, it has to do with the "fictive motion" (Talmy, 1996) of an implicit and often abstract entity standing in for the intent or action of the agent, such as "a sign or message with communicative actions, a body part or weapon with acts of aggression, and one's gaze with perceptual acts" (Zwarts, 2019, p. 224). Because of these differences, we must take care not to conflate the RESPONSIVE sense of *back* with the other counterdirectional readings (RETURNATIVE and/or RESTITUTIVE) of primary interest here.

In short, the felicity of the adverb *back* in examples like these depends on the interpretation of the theme argument (i.e., the argument to be transferred).[6] Rather than simply comparing the paths associated with the two transfer events, *back* must also compare the individuals that undergo the transfer.

4. Analysis

The core pattern from the previous section is exemplified by (8), repeated here (contexts omitted) as (12). These examples differ primarily in the interpretation of the theme: *back* is felicitous in combination with the specific theme in (12a), but not the nonspecific theme in (12b).

(12) a. Emma offered Frank a/the bottle of wine back. (= a particular bottle)
b. Emma offered Frank a bottle of wine (#back). (= any bottle)

Both cases involve quantification over a set of possible worlds, and both cases make a claim about what must happen in those worlds—namely, that some individual must be transferred. But they make different claims about which individuals are transferred across those worlds. "Specific offers", which pertain to a specific individual as in (12a), quantify

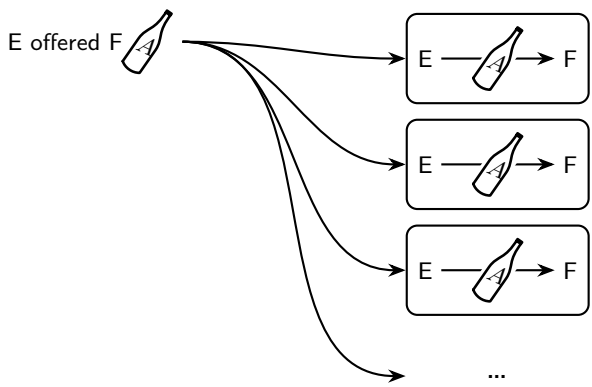
[6] Nonreferential indefinites in indirect object or subject position are generally infelicitous—and this does not improve in the absence of *back*, as (i–ii) show. That is, intensional transfer-of-possession verbs generally have existential import of the subject and indirect object.

(i) CONTEXT: *Several of Emma's neighbors had their bicycles stolen. Emma promised she would find at least one.*
#Emma promised a neighbor their bicycle (back).

(ii) CONTEXT: *Emma's bicycle was stolen. Her neighbors promised to find and return it.*
#A neighbor promised Emma her bicycle (back).

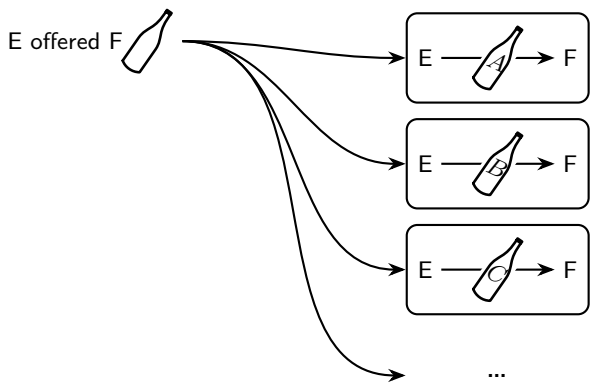
over a set of worlds like that schematized in (13): in every world where the offer is fulfilled, the same individual is ultimately transferred.

(13)



"Nonspecific offers", which can be fulfilled by a variety of individuals as in (12b), quantify over a set of worlds like that in (14): an individual with the relevant property must be transferred, but that individual varies.

(14)



The intuition behind the present account is that the adverb *back* must be sensitive to the identify of the individual in question. If so, then its presupposition ought to be much more easily satisfied in cases like (13), where a single previous transfer of bottle A can satisfy the presupposition of *back* for every world in the domain of quantification.

In (14), on the other hand, it seems that the presupposition of *back* is much harder to satisfy. If *back* evaluates the particular individual being transferred, then it can only felicitously apply to (14) provided there is a previous transfer of every single one of the (potentially infinitely many) bottles that could satisfy the offer. That is, the world of evaluation ought to contain a previous transfer of every bottle that exists or could exist, including bottles that do not yet exist at the time at which the offer or promise is made. This cannot be accommodated. The presupposition will necessarily fail to be satisfied in at least some worlds, which leads to infelicity on the whole.

In the remainder of this section, I give a formal treatment of this intuition which derives this putative intensionality from a purely extensional denotation for *back*. In so doing, there are three important questions that must be addressed. First is the apparent connection between *back* and the theme argument, which (following Iyer, 2023) I ascribe to an "identity

condition" in the presupposition of *back*. Second is the structure transfer-of-possession verbs themselves, which I decompose into (at least) two components. Third is the ability of *back* to "see into" both the world of evaluation w and all w' in the domain of quantification, despite not being intensional itself. (That is, modification by *back* does not derive an intensional interpretation from otherwise extensional cases.) I argue that this apparent intensionality arises not from *back* itself, but from entailments facilitated by the circumstantial modal base.

4.1. Counterdirectional *back* and identity of themes

The pattern observed in Section 3 is difficult to explain unless *back* is sensitive to the interpretation of the direct object (that is, the theme argument). As a first step, I repeat example (5) from Section 2, which gives a generic denotation for *back* closely following Zwarts (2019). This denotation presupposes a prior event e', which has some contextually-supplied property of events E' and which is the REVERSE of e.

(5) $[\![\text{back}]\!] = \lambda E \lambda e : \exists e'[e' < e \wedge E'(e') \wedge \text{REVERSE}(\text{PATH}(e), \text{PATH}(e')))].[E(e)]$

There are two places where this denotation bears some connection to the interpretation of the theme: the first is concealed by the predicate REVERSE, and the second is the contextual variable E'. Ultimately, neither of these connections will be sufficient for present purposes. Instead, I will adopt a modification proposed by Iyer (2023), replacing the contextual variable E' with an explicit test of the identity of the two themes.

4.1.1. reverse and the orientation of paths

Let us first consider REVERSE, which has until now been left as a black box. To understand its meaning, we must be clear about the formal status of a path and what it means to travel one.

Following Zwarts (2005, 2006, 2019), a path is defined as a function from the real interval [0,1] to some scalar or physical space. It effectively (i) picks out a subset of points in that space and (ii) assigns those points an ordering (such that the point mapped to 0 serves as the origin of the path, the point mapped to 1 serves as the terminus, and any points in between represent intermediate stages of development).[7] To access the path associated with a particular event, Zwarts defines several thematic (partial) functions from events to paths, which include SPATH from events to scalar paths and LPATH from events to locational paths. The more generic PATH, employed here, is defined as the union of those more specific functions. To illustrate this concretely, consider an event e in which I walk from my apartment to a restaurant. In that case, $\text{PATH}(e)$ will return the path function p associated with e. This p is a function onto the set of points in space that make up the route from my apartment to the restaurant in question. If we supply p with a numerical index in [0,1], it will return the corresponding spatial point: for example, $p(1)$ corresponds to the location of the restaurant itself. As shorthand, we might instead write $p(1)$ as $\text{PATH}(e)(1)$, supplying the index directly to the output of the thematic function.

The predicate REVERSE, then, is defined as in (15). This encodes a notion of "reversal" that is more permissive than what intuition might suggest[8], requiring only two points of intersection between paths p and p'. The origin of the first path, $p(0)$, must be the same as

[7] The term "path" may also refer, somewhat sloppily, to the resulting ordered set of points.

[8] For example, Beck and Gergel (2015, 185) model "reversal" such that p and p' pick out an identical set of points in the opposite order.

the terminal point of the second, $p'(1)$, and there must be one other point shared between the two paths.[9]

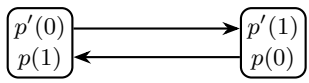
(15) For any two paths p and p', $\textsc{reverse}(p, p')$ iff: (Zwarts, 2019)

i. $p(0) = p'(1)$, and

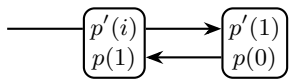
ii. there is a $j \in (0, 1]$ and an $i \in [0, 1)$ such that $p(j) = p'(i)$.

While prototypical cases might feature total overlap between the two paths, as in (16a), this is not required. (16b) demonstrates that the two paths need not have the same extent, while (16c) shows a case in which the two paths might share only their endpoints.

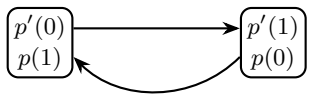
(16) a. I walked to the store. Then I walked back home by the same route.



b. I closed the door. The wind blew it back open, but not all the way.



c. I drove from Montreal to New York. I drove back to Montreal via Boston.



How, then, is $\textsc{reverse}$ sensitive to the theme argument? All paths, by definition, have some orientation, but a path receives this orientation only in virtue of the theme that travels it. Consider the two sentences in (16a) above. There is no inherent orientation to the set of spatial points that link *home* and *the store*; they receive an orientation only in virtue of my traveling them, and in fact may receive different orientations in different events. Thus there is no sense in which we can construct a path without a theme.

For completeness, I include Zwarts's (2019) formalization of this connection between path and theme: the predicate of events $\textsc{traverse}$, which is assumed to hold of any event associated with a path. As given in (17), $\textsc{traverse}(e)$ will be true under the following two conditions. First, each temporal point within $\textsc{time}(e)$, the time course of e, can be mapped by some function μ to an index in the real interval [0,1]. As points in $\textsc{path}(e)$ are mapped to this same interval, this establishes a correspondence between points in $\textsc{time}(e)$ and $\textsc{path}(e)$. Second—and more importantly, for present purposes—$\textsc{theme}(e)$ must be located at successive points in $\textsc{path}(e)$ at successive points in the time course of the event. That is, as the event proceeds in time, the theme proceeds along the path.

(17) For every event e, $\textsc{traverse}(e) = 1$ iff: (Zwarts, 2019)

i. there is a continuous function μ from $\textsc{time}(e) = [t_0, t_1]$ onto [0,1] such that $\mu(t_0) = 0$ and $\mu(t_1) = 1$, and

ii. for every $t_i \in [t_0, t_1]$ for which the $\textsc{path}$ function is defined, $\textsc{at}(\textsc{theme}(e), t_i, \textsc{path}(e)(\mu(t_i)))$, i.e., $\textsc{theme}(e)$ is located at $\textsc{path}(e)(\mu(t_i))$ at t_i.

[9] Although $\textsc{reverse}$ is effectively a condition on the "shape" of a path, it has the additional benefit of ensuring that a path and its reverse are always in the same domain. A point in physical space and a point in scalar space will not be identical to one another; neither will points in two different scalar spaces (e.g. *dirtiness* and *warmth*, Iyer 2023, p. 105).

Simply by virtue of taking paths as its arguments, REVERSE has a concealed dependency on the theme argument: the existence of a path entails the existence of a corresponding theme.

Returning to the denotation for *back* in (5) above, we can see that both events e and e', by virtue of having associated paths, must also have themes. But although $\textsc{path}(e)$ and $\textsc{path}(e')$ must stand in the REVERSE relation, there is as yet no link between $\textsc{theme}(e)$ and $\textsc{theme}(e')$. Although they both exist, we as yet have no mechanism to compare them.

4.1.2. An identity condition replaces a contextual variable

The second place that identity of themes might be encoded in (5) is in the properties of events E and E'. Here, E represents the property of events modified by *back*, while E' is a contextual variable over properties of events that represents "what is already in the common ground" about the prior event (Zwarts, 2019, 223–224). This variable E' is essentially a compromise: it approximates the behavior of prototypical cases, in which the same theme travels in the same manner (for example, (16a) or (16c) above), while also allowing for the flexibility to account for cases like those in (18), in which the manner (18a), theme (18b), or both are different.

(18) a. Ada fietste naar school. Ze liep terug. (Zwarts, 2019)
'Ada cycled to school. She walked back.'

b. Bob emigreerde in de jaren 50. Zijn familie keerde onlangs terug naar Holland.
'Bob emigrated in the fifties. His family returned to Holland recently.'

Zwarts recognizes that this most likely overgenerates, and we face the same issue here. If E' can be any property, with no specific relation to E other than what is in the common ground, then we expect the presupposition of *back* to be satisfied by a wide variety of events that share nothing with the asserted event other than the path traveled.

As pointed out by Iyer (2023, 90–95), the actual space of possibilities is much more restricted. In an out-of-the-blue context, examples like (19) seem to be non sequiturs. Despite the fact that the path and the manner of motion are the same, the difference between the two themes leads to infelicity.

(19) Sonam flew from Delhi to London. A day later, #Tara flew back to Delhi. (Iyer, 2023)

There is a clear tension between (18b) and (19): although in some cases the two themes may differ, in many cases that is simply not possible.

Iyer's (2023, 123–127) key insight into this issue is that non-identical themes cannot be chosen arbitrarily; rather, non-identity is felicitous only when one of the two themes serves as a "contextual proxy" for the other. This has less to do with the meaning of *back*, and more to do with contextual information and/or world knowledge pertaining to the referents of the non-identical themes. In the case of (18b), it is relatively easy to conclude that *Bob* and *Bob's family* are connected—perhaps metonymically, or perhaps by virtue of acting in the same interests. Example (19) does not support such an inference: two arbitrarily chosen people, about whom we have essentially no information, are unlikely to be connected in this way.

Thus Iyer reframes the issue: examples like (18b) are derivable only under pragmatic conditions that facilitate such a "proxy" relation. (As it is orthogonal to the main issue of this section, I postpone further discussion of this relation until Section 6.4.) Examples like (19), which show a strict identity requirement, most closely reflect the semantics of *back* itself.

Following Iyer, I replace Zwarts's contextual variable E' with an explicit requirement that the two themes be identical: that is, that $\textsc{theme}(e) = \textsc{theme}(e')$. This gives the denotation for *back* in (20).[10]

(20) $[\![\text{back}]\!] = \lambda E \lambda e : \exists e'[e' < e \wedge \textsc{theme}(e) = \textsc{theme}(e') \wedge \textsc{reverse}(\textsc{path}(e), \textsc{path}(e')))].[E(e)]$

This identity condition is a crucial tool in the present analysis. It is this condition that explains why the presupposition of *back* is sensitive to the interpretation of the theme argument in particular. To illustrate this in full, however, I must first lay out my assumptions regarding transfer-of-possession verbs themselves.

4.2. Decomposition of intensional transfer-of-possession verbs

As *back* remains extensional, the transfer-of-possession verb must be broken down into at least two pieces such that *back* can take scope below the modal component.

The lower element in the decomposition, to which I give the placeholder label TRANSFER, describes the (potential) transfer, which comes to pass when the *offer*, *promise*, or other obligation is ultimately fulfilled. I model this with the denotation in (21), which combines with a property of individuals P (supplied by the direct object) and an individual x (the indirect object), and returns, roughly, the property of "events in which some P individual travels along a path to x".[11]

(21) $[\![\textsc{transfer}]\!] = \lambda P_{\langle e,t\rangle} \lambda x \lambda e[\exists y[P(y) \wedge \textsc{theme}(e, y) \wedge \textsc{traverse}(e) \wedge \textsc{path}(e)(1) = \textsc{location}(x)]]$

This includes two terms following Zwarts (2005, 2019, a.o.): (i) any event e to which this property applies must be one for which $\textsc{traverse}(e)$ is true (as this is a necessary condition for e to be mapped to a path), and (ii) PATH(e) must be such that its endpoint, $\textsc{path}(e)(1)$, is the location corresponding to the recipient x.

At its core, this meaning is locative. Transfers of possession might, of course, be encoded by other sorts of paths (see Section 6.1 for discussion). However, what is crucial for present purposes is not the *type* of path, but the mechanisms common to the interpretation of all paths. For ease of exposition, I will illustrate with this same 'spatial' meaning of TRANSFER throughout the remainder of this section.

The higher element in the decomposition, given in (22), represents the transfer-of-possession verb itself.[12] This makes two main contributions. First, it supplies the lexical-encyclopedic content associated with the verb. Here I illustrate with *offer*, but this can be extended to *promise*, *owe*, and other intensional transfer-of-possession verbs with the appropriate substitutions. Second, it introduces a modal component which universally quantifies over the set of worlds in which the offer is carried through to completion, with the "content" of the offer (i.e., what occurs when the offer is carried through) given by the property of events E (contributed by its complement).

(22)

[10] Iyer proposes two further modifications which I do not adopt: a condition that asserted and presupposed events occur on the same scale (Iyer, 2023, p. 104), and a simplification of REVERSE such that it requires only a single point of overlap (Iyer, 2023, p. 107). The former is redundant, and the latter appears to overgenerate in spaces with more than one salient dimension (i.e. physical space).

[11] As the meaning of TRANSFER is extensional (i.e., all components of its meaning are evaluated relative to the same world) I omit world subscripts in (21). Note that THEME here picks out the argument that undergoes the change described by the path. This subsumes both figures of motion and themes of scalar change.

[12] Here v represents the semantic type of events.

$[\![\text{offer}]\!]^w = \lambda E_{\langle v,t\rangle}\lambda e[\text{offer}_w(e) \wedge \forall w'[w' \in \text{BEST}_{g(w)}(f(w)) \rightarrow \exists e'[\text{CAUSE}_{w'}(e,e') \wedge E_{w'}(e')]]]$, where $f(w) = \{w' : w'$ contains an event e that is a duplicate of e in w, and w' shares with w all relevant circumstances surrounding $e\}$

Following Kratzer (1981), $f(w)$ characterizes a set of accessible worlds (the modal base), while $g(w)$ induces a ranking on that set (it functions as an "ordering source"). The domain of quantification in (22) is the set of worlds given by $\text{BEST}_{g(w)}(f(w))$, which picks out the subset of worlds in $f(w)$ that are most highly ranked according to $g(w)$.[13]

Specifically, I assume that transfer-of-possession verbs like *offer* incorporate a circumstantial modal base $f(w)$ and a teleological ordering source $g(w)$.[14] That is, the modal base contains all worlds which share some relevant set of circumstances (i.e., true propositions) found in w, whether or not the transfer is ultimately carried out in those worlds. This includes the existence of a duplicate of event e from the world of evaluation, as well as all relevant propositions pertaining to e.[15] The ordering source then restricts the domain of quantification to only those worlds where the transfer is ultimately carried out.

We see the composition of *offer* and TRANSFER more concretely in (23). First, TRANSFER combines with the direct object, *a bottle of wine*, and the indirect object, *Frank*, to yield a property of events in which some bottle of wine follows a path ending at Frank. This property then composes with *offer* as in (23b), such that in all worlds in the domain of quantification, such a transfer event occurs.

(23) "offer Frank a bottle of wine"

a. $[\![\text{TRANSFER}]\!]([\![\text{a bottle of wine}]\!])([\![\text{Frank}]\!]) = \lambda e[\exists y[\text{bottle-of-wine}(y) \wedge \text{THEME}(e,y) \wedge \text{TRAVERSE}(e) \wedge \text{PATH}(e)(1) = \text{LOCATION}(\text{Frank})]]$

b. $[\![\text{offer}]\!]^w([\![(23a)]\!]) = \lambda e[\text{offer}_w(e) \wedge \forall w'[w' \in \text{BEST}_{g(w)}(f(w)) \rightarrow \exists e'[\text{CAUSE}_{w'}(e,e') \wedge \exists y[\text{bottle-of-wine}_{w'}(y) \wedge \text{THEME}_{w'}(e',y) \wedge \text{TRAVERSE}_{w'}(e') \wedge \text{PATH}_{w'}(e')(1) = \text{LOCATION}_{w'}(\text{Frank})]]]$

In the normal course of things, then, (21) and (22) compose to a meaning that is roughly similar to those employed for intensional transfer-of-possession verbs by Martin and Schäfer (2012, 2017) and Kratzer (2013). The most important difference is that here, the transfer of possession is modeled not as a state, but as the traversal of a path.

This adequately captures the behavior of *offer* in the general case. In particular, it allows for "broken promises": cases in which the potential transfer does not ultimately occur in the world of evaluation w. Although w is necessarily included in the modal base, it is not necessarily ranked among the "best" worlds therein—and therefore no particular claim is made about a transfer in w itself.

This can also capture the behavior of *offer* when combined with specific definite or specific indefinite objects. In such cases, I assume the direct object is type-shifted into a property

[13] I use the abbreviated "$f(w)$" rather than "$\bigcap f(w)$" to make the formula easier to read. I also make the Limit Assumption; that is, I take for granted that there will always be some set of worlds closest to the ideal described by $g(w)$. The set of worlds $\text{BEST}_{g(w)}(f(w))$ can alternately be given as $\{w : w \in f(w) \wedge \neg\exists v[v \in f(w) \wedge v \leq_{g(w)} w]\}$, that is, the (proper or improper) subset of worlds in $f(w)$ for which there is no other world in $f(w)$ better ranked according to the ordering established by $g(w)$.

[14] A *teleological* conversational background (following Portner, 2009) picks out a set of goals, which for present purposes must include the fulfillment of the *offer*. Martin and Schäfer (2012, 2017) follow Koenig and Davis (2001) in referring to this type of modal as "energetic", and Kratzer (2013) employs a "normative" modal for the same function (assuming the "norms" associated with an *offer* include its fulfillment).

[15] We might instead make a stronger assumption: that each w' in $f(w)$ is an exact duplicate of w up to and including the *offering* event. This is not strictly necessary, however.

of type $\langle e, t\rangle$ that holds only of a particular individual (for example, "the bottle of wine" is represented along the lines of "$\lambda x.x$ is the unique salient bottle of wine"). After that point, the composition proceeds identically, differing only in the property which must hold of the tranferred theme.

(24) "offer Frank the bottle of wine"

a. $[\![\textsc{transfer}]\!]([\![\text{a bottle of wine}]\!])([\![\text{Frank}]\!]) = \lambda e[\exists y[\text{this-bottle-of-wine}(y) \wedge \textsc{theme}(e, y) \wedge \textsc{traverse}(e) \wedge \textsc{path}(e)(1) = \textsc{location}(\text{Frank})]]$

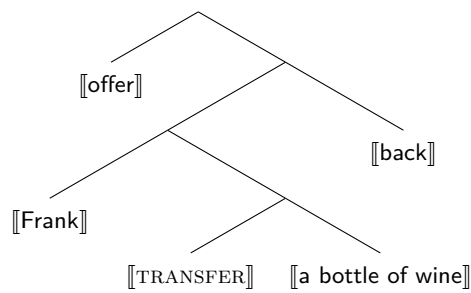
b. $[\![\text{offer}]\!]^w([\![(24a)]\!]) = \lambda e[\text{offer}_w(e) \wedge \forall w'[w' \in \textsc{best}_{g(w)}(f(w)) \rightarrow \exists e'[\textsc{cause}_{w'}(e, e') \wedge \exists y[\text{this-bottle-of-wine}_{w'}(y) \wedge \textsc{theme}_{w'}(e', y) \wedge \textsc{traverse}_{w'}(e') \wedge \textsc{path}_{w'}(e')(1) = \textsc{location}_{w'}(\text{Frank})]]]$

By supplying the transfer-of-possession verb with a more or less restricted property, we derive the contrast schematized in (13–14) above. For specific offers like that in (24), each world in the domain of quantification must be such that the same unique bottle is transferred. For nonspecific offers like that in (23) above, the worlds in the domain of quantification can involve the transfer of any bottle.

4.3. Entailments from the circumstantial modal base

This decomposition offers a scope position for the adverb *back*, seen in (25) below, that is above the path description and below the modal component. The composition of TRANSFER and its arguments proceeds exactly as before, deriving a property of events with an associated path. It is to this property that *back* applies. Up to this point in the derivation, we are dealing with only a single world argument: the TRANSFER event e occurs in w', and the presupposition of *back* requires a prior event e' in the same w'. The paths associated with e and e' must satisfy REVERSE, which in this case requires (i) that $\textsc{path}(e)$ end and $\textsc{path}(e')$ begin at the point corresponding to Frank, and (ii) that they share at least one other point. This second criterion, in a context like those provided in Section 3, might be satisfied by the point corresponding to the agent of the offer, Emma, or might be satisfied by some intermediate point.

(25) "offer Frank a bottle of wine back"



a. $[\![\textsc{transfer}]\!]([\![\text{a bottle of wine}]\!])([\![\text{Frank}]\!]) = \lambda e[\exists y[\text{bottle-of-wine}(y) \wedge \textsc{theme}(e, y) \wedge \textsc{traverse}(e) \wedge \textsc{path}(e)(1) = \textsc{location}(\text{Frank})]]$

b. $[\![\text{back}]\!]([\![(25a)]\!]) = [\![(25a)]\!]$, *defined iff* $\exists e'[e' < e \wedge E'(e') \wedge \textsc{reverse}(\textsc{path}(e), \textsc{path}(e'))]$

c. $[\![\text{offer}]\!]^w([\![(25b)]\!]) = \lambda e[\text{offer}_w(e) \wedge \forall w'[w' \in \textsc{best}_{g(w)}(f(w)) \rightarrow \exists e'[\textsc{cause}_{w'}(e, e') \wedge \exists y[\text{bottle-of-wine}_{w'}(y) \wedge \textsc{theme}_{w'}(e', y) \wedge \textsc{traverse}_{w'}(e') \wedge \textsc{path}_{w'}(e')(1) = \textsc{location}_{w'}(\text{Frank})]]]$

When *offer* applies to its complement, we introduce the modal component. We are now dealing with many transfer events across the many w' in the domain of quantification, and the presupposition of *back* must evaluated for each of these w'. That is, for the complement of *offer*—and thus the sentence as a whole—to be defined, it must be the case that every world in $\text{BEST}_{g(w)}(f(w))$ contains a prior reverse transfer.

In two important regards, this derivation may not immediately appear adequate. The first is that although *back* intuitively needs to "see" certain facts in w, it only has access to w'. The second is that the presupposed transfer must intuitively precede the *offering* event—a stricter timing requirement than *back* imposes.

The first issue has a built-in solution: because the modal base is circumstantial, the presupposition of *back* is sensitive to certain states of affairs in w even without direct access to w itself. Consider that the circumstantial modal base comprises all worlds that share some set of relevant circumstances with w. So long as we are dealing with those shared circumstances, there is by definition a mutual entailment relation between the world of evaluation w and any w' in the modal base: any such circumstance that obtains in w will obtain in w', and any such circumstance that obtains in w' will obtain in w. For ease of exposition, let us assume that all worlds in $f(w)$ are duplicates of w up to and including the time at which the *offering*/*promising* event occurs.[16] With that, the issue of visibility disappears. The presupposition of *back* requires a prior transfer event e' in every w' in the modal base, and the existence of such an e' in those worlds entails the existence of an identical e' in the world of evaluation w.

The timing issue can be resolved similarly. The meaning of *back* requires that in some world w', the presupposed transfer event e' occur prior to the asserted transfer event. There are in principle two different ways in which any given w' in $f(w)$ could individually satisfy this presupposition. First, it may be the case that e' is part of the shared circumstances. This is unproblematic; it immediately follows that e' must occur at or prior to the time of the *offering*/*promising* event (as that is as far as the shared circumstances extend). Second, it may be the case that e' is not part of the shared circumstances, but rather arises through subsequent developments particular to w'. For example, say that some theft, loss, or other transfer occurs after the promise is made, but before the promise is honored; the presupposition of *back* might then be satisfied in virtue of reversing this new theft/loss/other transfer. However, given that the worlds in the modal base are heterogeneous in all respects other than the shared circumstances, it is impossible to guarantee that every world in $f(w)$ will develop in this same way.

5. Prediction: Felicitous intensional cases

In the present account, presupposition failure of *back* simply results when it is not possible to find previous transfer events of the correct sort. Variation in the identity of the theme across worlds, while a key contributing factor, does not in and of itself guarantee presupposition failure. After all, there is no need for the presupposition of *back* to be satisfied in each possible world *by the same previous event*. This makes an important prediction: *back* should felicitously modify some intensional cases, provided proper contextual support.

This can be achieved with a contextual restriction. In (26a), for example, the content of the teacher's promise does not relate to any arbitrary comic book, but to one of a small set of salient comic books. This gives rise to a modal base as in (26b), in which the offer can be

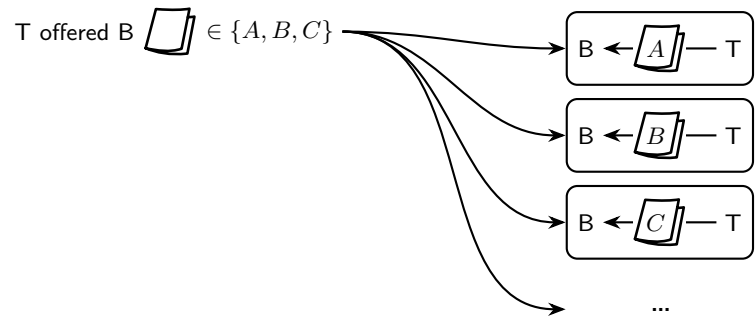
[16] This is not strictly necessary. Minimally, the set of "relevant circumstances" in the denotation of *offer* given in (22) must include the prior transfer event to which *back* is sensitive.

fulfilled by different comics across different worlds, but cannot be fulfilled by any arbitrary comic.

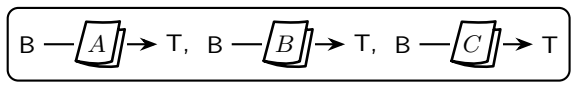
(26) a. CONTEXT: *Bill often reads comic books in class. His teacher has confiscated three so far, but this has not helped Bill's grades. To motivate him, the teacher promises that if Bill gets an A on the next quiz, he will return one comic book to Bill.*

The teacher promised Bill { a comic book / one of his comic books } back (if he gets an A).

b.



c.



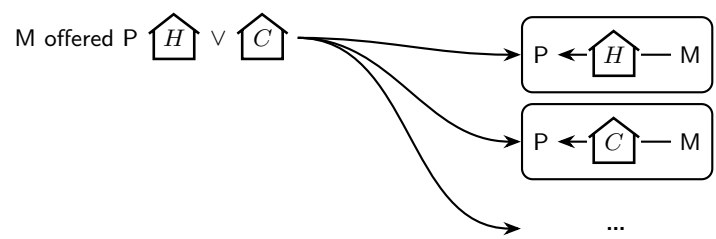
Importantly, the world of evaluation, as represented in (26c), contains a well-formed previous transfer involving each of these comic books. Whether they have been transferred in a single prior event or separately is immaterial. This means that although the offer can be fulfilled by different individuals across different worlds, the presupposition of *back* can be satisfied in each of those worlds, given the shared circumstances they inherit from the world of evaluation.

Similar behavior is observed when the theme is under the scope of disjunction. The offer in (27a) can be fulfilled if either the house or the cabin are ultimately transferred. Again, the worlds in the modal base vary, but both "house worlds" and "cabin worlds" contain a well-formed prior transfer. Therefore the use of *back* in (27a) is felicitous.

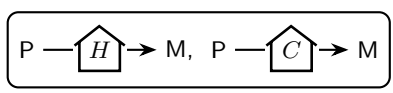
(27) a. CONTEXT: *When Mary's parents retired, they sold her their house in town and their lake cabin, and bought an RV. They eventually got sick of traveling, so Mary offered to sell them one of their old properties to settle down in.*

Mary offered her parents the house or the cabin back.

b.



c.



These cases are naturally captured by the present account, because it is not intensionality per se, but failure to find a well-formed prior transfer event, that leads to infelicity. Having a consistent theme across all worlds in the modal base naturally facilitates modification by *back*, but this is not strictly required.

6. Discussion

In the preceding sections, I have set aside several issues that deserve further consideration. Section 6.1 addresses transfers of possession that do not involve physical motion. Section 6.2 examines the remaining counterdirectional reading in Zwarts's "*re* domain": the RESPONSIVE reading, which does not display the same pattern of infelicity found with other counterdirectional readings. Section 6.3 addresses two points of syntactic variation. Section 6.4 discusses the identity condition adopted in Section 4.1 and the "proxy relation" (Iyer, 2023) that circumvents it. Section 6.5 addresses a pattern of infelicity involving the adverb *again* that, despite surface similarities, cannot easily be unified with the present account of *back*.

6.1. Spatial and possessive paths

In section 4.2, I employ a placeholder predicate TRANSFER with an essentially locative meaning. But, as already mentioned, not all transfers involve literal physical movement. This is clear from intuitive judgments regarding some of the examples employed here; for example, the "house or cabin" scenario in (27) above does not require that the transferred property be relocated.

This is also an attested fact regarding the well-known "dative alternation", in which transfer-of-possession verbs may combine either with two DP objects, or with one DP and one PP object. The two argument frames show a key semantic contrast: the double object frame in (28a) and (29a) encodes a possessive relation, while the DP–PP frame in (28b) and (29b) encodes a locative relation (see Green, 1974; Larson, 1988; Harley, 2002; Beck and Johnson, 2004, a.o.).

(28) a. I gave/sent a letter to my niece.
b. I gave/sent my niece a letter.

(29) a. I promised/offered my niece a cookie.
b. I promised/offered a cookie to my niece.

The analysis developed in this paper should apply equally well regardless of the particular type of path involved. The denotation proposed for *back* requires a theme argument, but nothing hinges on the syntactic locus of that argument. Likewise, *back* requires a path, but nothing hinges on the specific *type* of path. So long as events encoding change of location and change of possession both take theme arguments and are both associated with paths, this analysis predicts that both should interact with the adverb *back* in essentially the same way.

That said, the status of possession within the *re* domain is not fully clear. Zwarts does not make a strong claim as to which reading(s) encode possession, though he does categorize some examples involving transfer of possession verbs (*give, throw*) as RETURNATIVE (Zwarts, 2019, 215, 223). Iyer, on the other hand, posits a dedicated RE-POSSESSION reading that is semantically similar to the RESTITUTIVE, but lexicalized in Hindi-Urdu like the RETURNATIVE (Iyer, 2023, 238).

It seems plausible that transfers of possession can be represented in (at least) two ways. First, the theme may travel a path in physical space, with the final point thereof being the

location of the theme—and it is this sort of physical path I assume in the denotation of the placeholder predicate TRANSFER in section 4.2.

Second, the theme may move along a minimal path representing change of possession. Just as a physical path is constructed relative to a location, this path is constructed relative to some individual x, and it comprises exactly two points, one at which the theme is in the possession of x, and one at which it is not. Over the course of a transfer, the theme moves along a path p from 'not possessed by x' to 'possessed by x', and a previous loss of possession can provide a path p' from 'possessed by x' to 'not possessed by x'. This provides the minimum two points per path that we need in order to evaluate $\text{REVERSE}(p, p')$, and the remainder of the semantic compsition can go through exactly as previously laid out.

For concreteness, we might substitute the alternative placeholder in (30) for any changes of possession judged not to involve movement through physical space.

(30) $[\![\text{TRANSFER}_{\text{poss}}]\!] = \lambda P_{\langle e,t\rangle}\lambda x\lambda e[\exists y[P(y) \wedge \text{THEME}(e,y) \wedge \text{TRAVERSE}(e) \wedge \text{PATH}(e)(1) = \text{POSSESSED-BY}(x)]]$

However, it is not entirely clear to me where this type of possessive path ought to sit within the *re* domain framework. It may be that this is a defective scalar path, a special case among spatial paths, or a dedicated possessive path distinct from both other types. More data is needed to adjudicate between these possibilities. But because this does not alter the general means by which paths are constructed and interpreted, the present account might make use of any of these options in the same way as it does purely spatial paths.

Of course, both versions of TRANSFER are merely a convenient stand-in. The complement of the transfer of possession verb is both syntactically and semantically heterogeneous, and I do not have space here to explore all possible options. Suffice it to say that the present account is compatible with paths of various types, whether chosen on semantic grounds (with or without input from the pragmatics), based on the underlying syntax (for example, from the choice of P_{TO} versus P_{HAVE} in Harley 2002), or through some combination of these criteria.

6.2. "Action paths" and the responsive reading

Despite the general character of the present analysis, there remains a type of path that does not behave like the others discussed here. That is Zwarts's so-called "action path", which takes the agent and patient as its endpoints, and it is traveled by some implicit representation of the action: "a sign or message with communicative actions, a body part or weapon with acts of aggression, and one's gaze with perceptual acts" (Zwarts, 2019, 224–225). Essentially, an action path encodes the "fictive motion" (Talmy, 1996) by which an action "goes" from agent to patient.

The precise way in which action paths are composed is not certain, but they clearly represent a rather different sort of object than scalar/locational paths. Semantically, scalar/locational paths are functions onto subsets of points in scalar/physical space, ordered by the change in/movement of some individual. Action paths, on the other hand, are functions onto subsets of the domain of individuals, ordered by the action (or possibly the goals, force, or intent) of an agent. Syntactically, scalar/locational paths are typically derived by a projection that combine with the verb (e.g., prepositional phrases or small clauses), but if there is a constituent that derives an action path, it is presumably the verbal projection itself.

Although adverbs like *back* can certainly combine with action paths, this may be subject to syntactic/semantic restrictions not found for other types of paths. Iyer (2023, 142) notes that in Hindi-Urdu, the polysemous adverb *vaapas* 'back' receives a RESPONSIVE reading

only as the elsewhere case, when a RESTITUTIVE or RETURNATIVE reading is unavailable, and that when it does so, *vaapas* takes exceptionally high scope. This "elsewhere case" view seems compatible with the unexpected judgments regarding example (10) in Section 3, where a marginal responsive reading emerges (for some but not all English speakers) when not blocked by another counterdirectional reading. The English facts, however, require further investigation.

In short, such "action paths" are quite different than locational or scalar paths, and (as expected under the current analysis) do not follow the same pattern of infelicity.

6.3. Syntactic variation in transfer events

In this section, I briefly address two additional issues related to syntactic variation. The first is the ability of intensional transfer-of-possession verbs to take complements of varying sizes. In addition to monoclausal examples like (31a), which are treated as involving small clauses by some authors and prepositional phrases by others, we might instead embed a nonfinite or finite clause. This can be quite similar in meaning to monoclausal examples, as in (31b), but may also express a much wider range of meanings, as in (31c).

(31) a. I promised him a book back.
b. I promised {to give him back a book / that I would give him back a book}.
c. I promised {to stop smoking / that I would stop smoking}.

On this topic I have little to say at present, except that the division of transfer-of-possession verbs assumed in Section 4.2 appears well-suited to capture this variation. The lexical content of *promise* and the modal component it introduces appear to be roughly consistent across all three examples in (31); we simply replace the constituent that introduces the path in (31a) with a larger constituent describing the state of affairs to which the promise pertains. Note that presuppositional elements under the scope of the intensional transfer-of-possession verb, such as *back* in (31a–b) and *stop* in (31c), give rise to similar entailments (i.e., that the presupposition holds in the world of evaluation) regardless of the syntactic structure in which they are embedded.[17]

The second issue, raised by an anonymous reviewer, relates to an important prediction of the present account: *back* should felicitously modify any case involving a path, including those determined by scalar predicates or "incremental themes" (particular arguments of certain predicates; see Hay et al. 1999; Ramchand 2008), and should not felicitously apply in cases with nonscalar results (e.g., *dead*, *alive*, *prime*; see Wechsler 2005). This prediction appears to be borne out in its broad strokes, but is subject to some syntactic complications. Scalar predicates, as in (32), can be modified by *back*, as can incremental themes, as in (33)—though in many or all such cases, this requires an additional element in the form of a particle. (I assume this is driven primarily by syntactic considerations: for example, that the additional structure associated with the particle provides an attachment site for *back* that it would otherwise lack.)

(32) The room had gotten too warm, but the air conditioner cooled it back *(down).

(33) The bird regurgitated its food, then ate it back *(up).

In contrast, nonscalar result predicates, for example *dead* or *prime*, cannot be modified by *back* even when a substantially-similar paraphrase (such as a PP resultative) can.

[17] Thank you to an anonymous reviewer for highlighting cases like (31c).

(34) The hero of the film stabbed the zombie back {to death / #dead}.

(35) After adding two more terms, the total was back {to a prime number / #prime}.

For present purposes, the basic contrast between (32–33) and (34–35) supports the present account and its central role for paths/scales. Much remains to be said about the syntactic and semantic interactions between *back* and the various types of resultative and verb–particle constructions described in the literature, but this must be left for future work.

6.4. Proxy themes and the identity condition

In Section 4.1, I claim that the denotation of *back* includes an identity condition. This seems reasonable given that the theme of the asserted and presupposed events are generally identical, and that counterexamples are licensed only under restricted pragmatic conditions (Iyer, 2023).

Iyer provides a number of examples, noting that non-identity of the theme is permitted when the context provides for some sort of equivalence relation. These include "disguise" cases like (36), where two different names refer to the same individual, and "proxy" cases like (37), where the two individuals are understood to be acting in the same interests.[18]

(36) Sonam flew from Delhi to London. A day later… (Iyer, 2023, p. 127)

a. CONTEXT: *Sonam and Tara are different people.*
…#Tara flew back to Delhi.

b. CONTEXT: *Tara is Sonam in disguise.*
…Tara flew back to Delhi.

(37) An executive flew to San Francisco and then… (Iyer, 2023, p. 92)

a. …#a janitor flew back the next day.

b. …an assistant flew back the next day.

To these, we can now add a third exception: cases in which the two referents stand in a part-whole relation, as in (38a–d).[19]

(38) a. The racecar crashed on the very first turn. One wheel came off and rolled back to the starting line.

b. Slowly pour the hot liquid into the bowl with the egg yolks, whisking constantly. [Then] pour the mixture back into the pot…

c. Transmissions are sent from a factory in Ohio to an assembly plant in Ontario, where they are put in vehicles. Those vehicles are sent back to the United States.

d. Hanna gave Agatha a dress. Agatha was very upset and tore it to shreds. Then she gave a button back to Hanna, to show it had been destroyed.

It is clearly not sufficient, however, for the two themes to share any arbitrary property. For example, the use of *back* in (39a) is not licensed by the theme's being a green dress in both cases, and neither is its use in (39b) licensed by both Bob and Famke Janssen's having the property of being Dutch. Thus we are left with a relatively constrained set of exceptions.

[18] In a neutral context, this interpretation is more easily accessible for an executive and an assistant than for an executive and a janitor. However, it may be possible to construct contexts in which a CEO and janitor *do* stand in such a proxy relation, and thus make (37a) felicitous. For example: *A bumbling executive flew to San Francisco, where the CEO, in a show of disrespect, fired him and replaced him with a janitor.*

[19] Example (38b) is taken from a recipe for crème anglaise. Example (38c) is adapted from an online article. Example (38d) is provided by a reviewer.

(39) a. CONTEXT: *Last Christmas, my sister gave me a green dress. This year, I gave her a different green dress.*
#I gave my sister back a green dress.

b. My friend Bob emigrated from Holland in the fifties. #Famke Janssen came back (to Holland) recently. (Iyer, 2023, p. 92)

The disguise cases are straightforward, given that the two distinct names refer to the same individual. The proxy and part-whole cases are far more interesting at present, because they cast genuine doubt on the proposed identity condition. However, these are quite similar to several other cases of "referential extension" noted in the literature. Of particular note are two specific phenomena analyzed as involving a similar "proxy" relation, proxy anaphora (Jackendoff, 1992; Schladt, 2000; Reuland and Winter, 2009) and proxy control (Doliana and Sundaresan, 2022), though there are also broad similarities with a variety of other attested cases of metonymy (Nunberg e.g. 1979; Fauconnier e.g. 1985; Postal e.g. 2004).

(40) Proxy anaphora (Jackendoff, 1992, 4):

CONTEXT: *I was strolling through the wax museum with Ringo Starr, and we came upon the statues of the Beatles.*
All of a sudden Ringo started undressing himself.

(41) Proxy control (Doliana and Sundaresan, 2022, 49):

CONTEXT: *There is a donkey next to the elementary school. The kids would like to pet it. The teacher asks the farmer if they are allowed to do that.*
Il contadino$_j$ ha permesso alla maestra$_i$ [di poter=lo accarezzare].
the farmer has allowed to.the teacher C may.INF=it pet.INF
'The farmer permitted the teacher$_i$ [*proxy*(i) to pet the donkey].'

(42) Metonymic extension (Postal, 2004, 102):

I am parked on Twenty-sixth Street. (= "my car is parked on Twenty-sixth Street")

These processes are licensed by a complex and heterogeneous array of semantic and pragmatic factors, and they are subject to variation across contexts, speakers, and languages. Despite this, the basic similarity of function is intriguing.

For the present, I hypothesize that cases like (36–38) above, in which the presupposed and asserted themes are not strictly identical, are simply part of a larger group of referential extension phenomena—in which notions of contextual equivalence like this "proxy" relation presumably play a crucial role.[20] Perhaps part-whole examples like (38) can be analyzed as a special case of the proxy relation, as Doliana and Sundaresan (2022) claim that partial control can be reanalyzed as a special case of proxy control. Alternatively, perhaps the proxy relation can be treated as a special case of the part-whole relation (i.e., it obtains between two parts of some abstract whole). The meaning of *back*, then, can maintain its strict identity condition, while relying on a more general mechanism of referential extension to account for the handful of apparent counterexamples noted in the literature.

The main advantage to this is generality. Despite their polysemy, English *back* and its cross-linguistic counterparts appear to represent relatively stable grammatical concepts. The licensing of proxy readings, on the other hand, appears subject to considerable variation across contexts, speakers, and languages. Because of this, I am hesitant to claim that counterdirectional lexical items directly encode such a proxy relation. Rather, I hope that the extension of the reference of the theme argument in cases like (36–38) can be explained

[20] An anonymous reviewer of Doliana and Sundaresan (2022, fn. 8) makes a similar suggestion.

by appealing to more general semantic and pragmatic factors—though I must leave the details of this for future research.

6.5. The "ban on narrow scope" of *again* (Iyer 2019)

Before concluding, I will briefly discuss a superficially-similar pattern of infelicity noted for English *again* and its counterparts in other languages, including German, Hindi-Urdu, and Hungarian (von Stechow, 1996; Dobler, 2008; Csirmaz, 2015; Lechner et al., 2015; Iyer, 2019). This pattern pertains to what I refer to as the "low repetitive" reading of *again*, and is absent for "high repetitive" *again*[21].

The most detailed discussion of this pattern comes from Iyer (2019), who claims that *again* requires a specific interpretation of the direct object. When a state once again holds of a specific individual, as in (43), the use of *again* is felicitous, but when a state holds for the first time of some arbitrary individual with the same property as a previous holder, the use of *again* is claimed to be infelicitous. In this case, *again* cannot describe the repetition of a state of "some door being open".

(43) CONTEXT: *Lisa's house was built with one door permanently open for ventilation. Ali thought this was unsafe, and so he closed it. Lisa preferred how things were before, so she restores that door to its prior state.*
Lisa opened a door again. (Iyer, 2019, ex. 15a)

(44) CONTEXT: *Ali's house has one door built permanently open for ventilation. He thought this was unsafe, and so he closed it. Later, Lisa comes to the house for the first time, and opens some other door.*
#Lisa opened a door again. (Iyer, 2019, ex. 15b)

Iyer (2019) analyzes this pattern as a ban on narrow scope (relative to *again*) for small clause subjects. In her account, this stems from a requirement that small clause subjects must be of type e. Small clause subjects of type $\langle e, t\rangle$ undergo quantifier raising to a position above *again*, which forces a wide scope (i.e., specific) interpretation.

Although this pattern resembles the present observations regarding *back*, in that the (non)referentiality of the object correlates with (in)felicity, there are several reasons to think that the two phenomena cannot be unified.

Firstly, Iyer's type-restriction is inherent to the interpretation of (a particular argument within) the small clause. Because of that, we might expect to find this same type restriction across the board for all small clauses—a prediction incompatible with the basic intensional meaning of verbs like *offer* and *promise*. Cases involving intensional transfer of possession verbs are therefore either an outright counterexample to Iyer's proposal, or else simply outside its scope. Even if this type-restriction could in some way be ascribed to the adverb rather than the small clause itself, it does not predict the well-formedness of examples like those discussed in Section 5, in which the use of *back* becomes felicitous when the property of individuals given by the direct object is sufficiently constrained.

Secondly, the present analysis of *back* has little to say about *again*. The standard meaning employed by von Stechow (1996), and subsequently adopted as the REPETITIVE meaning in Zwarts's *re* domain, is given in (45) below. Note that this denotation, unlike the counterdirectional senses of *back*, has no special role for the theme argument. If the meaning of *again* in such cases could be analyzed as counterdirectional rather than repetitive, there may be a common line of analysis, but I do not know at present whether this is possible.

[21] With "low repetitive" and "high repetitive" corresponding to the labels "restitutive" and "repetitive" in broader literature, e.g. by von Stechow (1996).

(45) $[\![\text{again}]\!] = [\![\text{REPETITIVE}]\!] = \lambda E \lambda e : \exists e'[e' < e \wedge E(e')].[E(e)]$

Finally, other authors find this "missing" reading of *again* to be available. The pattern discussed by Bale (2007) crucially depends on mismatches between presupposed and asserted subjects (though examples with indefinites are not provided). Yu (2020) does present examples with indefinite small clause subjects—including the opposite judgment of precisely the same scenario as in (44) above.

(46) CONTEXT: *There are two doors, door A and door B. Door A was built open and door B built closed. The wind blows door A shut. Mary comes by and opens door B.*
Mary opened a door again. (Yu, 2020, ex. 3.7b)

This variation in judgments deserves further investigation, but at face value, it suggests that this constraint on the meaning of *again* is not as fundamental as the constraint on the interpretation of *back* discussed here.

7. Conclusion

This paper examines a novel pattern of infelicity, which arises when the English adverb *back* co-occurs with nonspecific themes of intensional transfer-of-possession verbs. This arises from a combination of factors: the adverb *back* requires that the asserted and presupposed events must have identical themes, and its presupposition must be evaluated separately in each world in the domain over which the verb quantifies. The ability of *back* to "see" across worlds is an illusion, the result of entailments that follow in virtue of the circumstantial modal base introduced by the verb. Importantly, this predicts the felicitous use of *back* within the small subset of intensional contexts in which every possible transfer can find a well-formed antecedent in the world of evaluation.

Although this paper primarily focuses on data involving the intensional transfer-of-possession verbs *offer* and *promise*, the core pattern discussed here—in which the (in)felicity of *back* arises from the (non)referentiality of the object—is expected to extend to all other intensional transfer-of-possession verbs, a class which appears to largely coincide with Levin's (1993) "verbs of future having" (notably *promise* and *offer*, also *allocate*, *guarantee*, *owe*, *vote*, etc.). This should also extend to other intensional verbs that incorporate a path at some level of representation. Some of Moltmann's (1997) "modal verbs of absence" (e.g. *need*) and "resultative verbs" (e.g. *hire*) may be candidates, though the verbs included in those classes do not uniformly permit modification by *back*. Further examination of specific verbs is needed to determine to what extent these expectations are borne out. Of course, verbs whose meaning does not involve a theme traveling or developing along a path should generally disallow modification by *back*, regardless of the interpretation of the object, and as seen in Section 6.3, syntactic variation may also play a role.

Because this analysis rests on a claim about a core meaning shared by lexical items across many languages, and not about language-specific particulars, we expect to find the same pattern of infelicity with counterdirectional lexical items in other languages. But due to the polysemy of English *back*, we must be somewhat cautious in framing this expectation. It is only when a lexical item expresses a counterdirectional RETURNATIVE or RESTITUTIVE meaning that this pattern should obtain, and not when that lexical item expresses another *re*-domain meaning (including RESPONSIVE, REPETITIVE, REARWARD, or RETROGRADE meanings). In making cross-linguistic comparisons, we must therefore be careful not only to consider which readings the relevant adverb is capable of expressing, but which reading it expresses within a particular context.

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