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Perspectives in discourse: The case of the motion verb *come**

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Abstract It has long been assumed that using the deictic motion verb *come* to describe a motion event involves taking the perspective of an individual located at the destination of the motion event (Fillmore 1966). I argue that this perspective-taking is built into the meaning of *come*, drawing on novel data concerning what I call the “anchoring implication” of *come*. This is the implication that a particular individual, the “anchor”, is located at the destination. I develop three empirical generalizations about the anchoring implication: acceptable anchors are limited to individuals with salient, relevant perspectives, the anchor argument satisfies classic diagnostics for anaphorically interpreted implicit arguments, and the anchoring implication is necessarily a *de se* commitment of the anchor. To account for these observations, I supplement the dynamic semantics of AnderBois et al. (2015) with representations of the perspectives of particular individuals, defined in terms of Stalnaker’s (2008) theory of belief and Roberts’s (2014) theory of doxastic perspectives. The anchoring implication of *come* is then modeled as an update to the anchor’s perspective. The resulting analysis is empirically superior to previous accounts and provides a lexical semantic justification for the intuition that using *come* involves perspective-taking. The paper concludes with a sketch of how the analysis can be generalized to account for another arguably perspectival phenomenon: non-speaker-oriented appositives.

Keywords: perspectival expressions, *de se*, deixis, implicit arguments, projection, dynamic semantics

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1 The anchoring of *come*

The deictic motion verb *come* denotes motion along a path defined in terms of the location of a specific individual, typically an interlocutor (Fillmore 1965, 1966, 1975, Talmy 2000, Nakazawa 2007, 2009).¹ I call this phenomenon **anchoring** and the relevant individual the **anchor**, borrowing the term from Levinson (2003) and Roberts (2014). Anchoring to the interlocutors is illustrated in (1), which shows that the use of *come* is acceptable if the destination is the speaker or addressee's current location.

- (1) [Context: Ann is in Cleveland, and Beth is in New York. They are talking on the phone. Ann says *Where is John these days?* Beth answers:]
- a. John is in Chicago. However, he is coming to New York tomorrow.
 - b. John is in Chicago. However, he is coming to Cleveland tomorrow.
 - c. #John is in Chicago. However, he is coming to Denver tomorrow.

(1c) shows that *come* cannot be used to describe John's motion to a destination where there is no anchor.²

To account for the anchoring of *come*, Fillmore (1965, 1966) proposes that an utterance with *come* gives rise to two distinct implications. The first is that the individual denoted by the subject of *come* moves along the path encoded by the prepositional phrase (PP) with which *come* combines. Simplifying just a little, the second is that the anchor of *come* is located at the destination of the motion event, as in (1a) and (1b). I call the former the **motion implication** and the latter the **anchoring implication**.

This paper develops three empirical generalizations about the anchoring of *come*. First, the anchor must be an individual whose perspective is salient and relevant in the discourse context. This observation is related to an intuition shared by many researchers, which is that the anchor is someone whose perspective the speaker adopts (Fillmore 1966, 1975, Taylor 1988, Goddard 1997, Oshima 2006a,b,c, Nakazawa 2007). The present account extends previous analyses by (i) providing empirical support for this intuition and (ii) using it as the basis for a formal account. Second, the anchor argument satisfies classic tests for anaphorically interpreted implicit arguments (Partee 1984, 1989, Condoravdi & Gawron 1996). Because the present account treats the anchor as an anaphor, it makes better empirical predictions than analyses that treat it as an indexical. Third, the anchoring implication is a *de se* commitment of the anchor. In other words, for *come* to be acceptable, the

¹ There is also a non-deictic use, at least for *come* in English (Radden 1996, Barlew 2015a) and *kommen* 'come' in German (Rauh 1981, Di Meola 2003; Antje Roßdeutscher p.c.). This use is ignored throughout, as are metaphorical extensions of both uses (Clark 1974).

² '#' indicates that an utterance is unacceptable in a context, and '??' indicates that it is marginal.

anchor must believe of herself that she is located at the destination of the motion event. This means that the truth or falsity of the anchoring implication is calculated relative to the anchor's perspective, i.e. the way she conceives of things. This novel observation reveals exactly how the meaning of *come* involves perspective-taking. It also motivates including a representation of individuals' perspectives in the formal framework.

Data supporting the empirical generalizations are presented in §2. The difficulties these data pose for previous accounts are discussed in §3. §§4-7 develop an analysis that accounts for the three empirical generalizations using independently motivated theoretical machinery, specifically Stalnaker's (2008) theory of beliefs, Roberts's (2014) theory of doxastic perspectives, and AnderBois et al.'s (2015) dynamic semantics. The account relies on the assumption that the interlocutors' shared information includes information about each other's beliefs (i.e. their perspectives) and the beliefs of other individuals, following Roberts (1996/2012), Gunlogson (2001), and Farkas & Bruce (2010), among others. The meaning of *come* is then analyzed as accessing and updating information about the anchor's perspective. The primary theoretical contribution of the work is to develop a formal model of discourse in which perspectival information is tracked and can be directly checked or updated as needed, and a model of the mechanisms by which lexical semantic content does this. §8, argues that the framework generalizes by showing how it can be used to analyze another plausibly perspectival phenomenon: non-speaker oriented appositives (Amaral et al. 2007, Harris & Potts 2009, AnderBois et al. 2015, Koev 2015).

2 Three empirical generalizations about the anchoring of *come*

This section provides evidence that (i) the anchor must be an individual with a salient, relevant perspective, (ii) the anchor is an anaphorically interpreted implicit argument, and (iii) the anchoring implication is a *de se* commitment of the anchor.

2.1 The perspectival anchoring of *come*

In this section, I draw on observations from the literature, in particular from Fillmore (1975) and Oshima (2006a,b), to argue that acceptable anchors are necessarily individuals with salient, relevant perspectives. Perspectives are defined formally below. Here, it is useful to think of them as sets of propositions representing the beliefs of individuals. By "salient", I mean being attended to by the interlocutors, as discussed in Gundel et al. 1993, Roberts 2011, 2014, and Barlew 2014, among others. By "relevant", I mean relevant to the question under discussion, in the sense of Roberts (1996/2012). Someone's perspective is salient and relevant just in case (i)

the interlocutors are attending to it and (ii) it is involved in answering the question under discussion.

First, Fillmore (1975), Oshima (2006a), and others suggest that the most common anchors of *come* are the speaker and addressee, as in (1). Corpus evidence supports this claim. The Corpus of Contemporary American English (COCA; Davies 2008) contains 11,896 tokens of the bigram [*come*] *here* (brackets around *come* indicate generalization over all of its forms). The indexical content of *here* guarantees that these examples describe motion to the location of the speaker, the addressee, or both. In contrast, only 555 instances of the bigram [*come*] *there* occur in the corpus, even though *there* is approximately 2.5 times more frequent than *here* (1,272,863 tokens vs. 474,839). This contrast demonstrates the prevalence of anchoring to an interlocutor.

Anchoring to an interlocutor is a case par excellence of anchoring to an individual with a salient, relevant perspective. On a Stalnakerian view of the discourse context, interlocutors' (purported) perspectives are salient and relevant because the common ground is defined in terms of them (Roberts 2014). Furthermore, as noted by Roberts (1996/2012), Gunlogson (2001, 2002), Farkas & Bruce (2010), and Lauer (2013), among others, when an interlocutor makes an utterance, the content of the utterance provides information about that interlocutor's perspective. This information about the interlocutor's perspective becomes part of the common ground, regardless of how the utterance itself is received. For these reasons, the interlocutors are always attending to each other's perspectives, and those perspectives are always relevant in the discourse.

The prevalence of interlocutor anchoring also provides evidence that *come* is a member of a larger class of perspectival expressions, i.e. expressions that require contextually supplied perspectival information for their interpretation. Such expressions anchor to the speaker by default (Fillmore 1975, Sells 1987, Speas & Tenny 2003, Roberts 2014), and also anchor to the addressee in certain contexts (Fillmore 1975, Mitchell 1986, Speas & Tenny 2003, Oshima 2006c, Smith 2009). *Come* follows this pattern.

If *come* is embedded under an attitude predicate or predicate of communication, the attitude holder is an acceptable anchor (see Fillmore 1975 and Hockett 1990 for early examples). Oshima (2006b,c) calls this kind of anchoring **deictic perspective shift**. Example (2) illustrates.

- (2) [Context: Ann is in Cleveland, Ben is in New York, and Chris is in Denver. On the phone, Ann asks Ben *Where is John these days?* Ben says:]
Chris {thinks/says} that John is coming to Denver today.

(2) is acceptable because Chris, the attitude holder, is in Denver. Oshima argues that this is because the embedded report in (2) is given from Chris's perspective. Furthermore, other perspectival expressions shift under attitude predicates in exactly the same way (Mitchell 1986, Sells 1987, Speas & Tenny 2003, Oshima 2006c, Smith 2009, Roberts 2014).

The final class of acceptable anchors consists of non-interlocutors who are not the attitude holders but whose perspectives are nevertheless salient and relevant in the discourse. Two naturally occurring examples are presented below. First, consider (3) from Virginia Woolf's *To the Lighthouse*, as quoted in Doron (1991: 52), where *she* refers to Lily Briscoe.

- (3) But with Mr. Ramsay bearing down on her, she could do nothing. Every time he approached - he was walking up and down the terrace - ruin approached, chaos approached. She could not paint ...
... She rejected one brush; she chose another. When would those children come? When would they all be off? she fidgeted ...

In (3), Briscoe's perspective is salient and relevant because the reader is privy to Briscoe's thoughts.

(4) provides another example in which a non-interlocutor's perspective is made salient, and an unembedded instance of *come* is anchored to that individual.

- (4) Meanwhile, Dick had himself just made his perpetual vows and was at home, preparing himself for the trip to France. (He had spent the preceding summer at St. Joseph's Oratory in Montreal, where he had made a start on French. He delighted in the pastoral work involved in helping the many pilgrims who **come there** in the summer.) He heard the news of my coming home, of my confused state of mind, and he was a little shaken. It took him only a moment to adjust, however, for he wrote that night to Father George S. DePrizio that his own desires remained unchanged. "I am anxious to study theology..."
[Novak, Michael. (2008). The day my brother was murdered. *American Spectator* 41:10, pp. 30-45 (COCA)]

Following Smith (2009), many expressions in (4) activate Dick's perspective, including the reflexive *himself* (see e.g. Sells 1987), the psych verb *delighted*, the perception verb *heard*, the emotional description *shaken*, the communication verb *wrote*, the discussion of Dick's *own desires*, and the direct quotation from his writing. Thus, expressions encoding information about Dick's perspective pervade the passage, making him an acceptable anchor for *come*.

One final observation about these naturally occurring examples provides additional support for generalizing in terms of perspective-taking. The examples employ a narrative style called Free Indirect Discourse (FID; see Doron 1991, Eckardt 2011, 2014). In FID, the narrator/speaker adopts a character's perspective, and many expressions that are typically anchored to the interlocutors, for example *here* and *now*, can be anchored to that character instead.

2.2 The anchor is an anaphorically interpreted, implicit argument

Examples (1)-(4) show that the anchor argument of *come* can be retrieved from the context of utterance, as in (1), or supplied by the previous linguistic context, as in (2)-(4). Following Partee (1984, 1989) and Condoravdi & Gawron (1996), the fact that the anchor takes antecedents of both types is evidence that it is an anaphorically interpreted implicit argument. The data in this section provide two additional kinds of support for this hypothesis: the anchor can be quantificationally bound and donkey anaphoric. In addition, the data show that bound and donkey anaphoric readings are only acceptable if domain quantified over consists of interlocutors, attitude holders, or other individuals with salient, relevant perspectives, strengthening support for the generalization developed in §2.1.

(5b) presents a quantificational example where the domain of quantification is addressees. In (5a), the utterance is unacceptable in a minimally different context without an appropriate domain.

- (5) [Context: The speaker doesn't go to football games or bars.]
- a. [Context: She is speaking to her husband about game day at OSU.]
#On game days, after the game, everyone comes to a local bar. (I can't imagine how crowded it must be on High Street. . .)
 - b. [Context: She is giving a speech about drunk driving to a convention of Columbus bar owners.]
On game days, after the game, everyone comes to a local bar. (You guys are responsible for them being sober enough to drive when they leave. . .)

On the assumption that people leaving the game go to different bars, (5b) involves multiple anchors: one for each destination. Each such anchor is a bar owner and also an addressee. In (5a), there are no such anchors, resulting in unacceptability.

(6) shows that anchors can be bound in examples with deictic perspective shift.

- (6) Every mother was glad that her wayward child came to Christmas dinner.

In (6), each mother is the anchor for a different motion event.

The anchor can also be bound in examples that involve deictic perspective shift but do not include embedding predicates, similar to the FID examples discussed above, as shown in (7a). The contrast with (7b) shows that, in order for the use of *come* to be acceptable, the perspectives of the bound anchors must be salient and relevant.

- (7) a. [Context: A group of women are standing around chatting. They look happy. Ann asks why. Bill responds:]
This weekend each of these women had a birthday party, and every woman's child came to her party.
- b. [Context: A group of young people are standing around chatting. They look grumpy and put out. Ann asks why. Bill responds:]
??This weekend each of these kids' mothers had a birthday party, and every kid came to her mother's party.
[c.f. ... *went to her mother's party.*]

In (7a), the perspectives of the women, specifically their emotional states, are under discussion, and the women are an acceptable domain of anchors. In contrast, in (7b), the perspectives of a group of children are under discussion, and the children's mothers are not acceptable anchors.³

(8) shows that the anchor of *come* can participate in donkey anaphora (Geach 1962). Donkey anaphora is an anaphoric relationship in which an indefinite inside a scope island introduces a discourse referent which is the antecedent for an expression that is outside the scope island. The minimally different examples in (9) once again highlight the importance of salient, relevant perspectives.

- (8) [Context: A small village recently suffered attacks in which tigers stole children from their beds at night. Now, a reporter is interviewing a teacher who is watching village children playing in the schoolyard. When asked how these children survived the attacks, the teacher says:]
- a. Every man that has a child came to her room at night to guard her.
- b. If a man has a child, he came to her room every night to guard her.

³ This is contra Barlew 2015b, which suggests that restrictions on acceptable anchors are relaxed in quantificational examples. Restrictions on anchoring do seem to be relaxed for generics, as in *If a man has a child, he comes to her room every night to check on her*, which is acceptable in a discourse describing the habits of conscientious fathers. Currently, I have no explanation for this observation. Thanks to Regine Eckardt (p.c.) and Craige Roberts (p.c.) for discussion.

- (9) [Context: A small village recently suffered attacks in which tigers stole children from their beds at night. Now, a reporter is interviewing the mayor, who is about to give a speech to all of the fathers in the town. When asked how the fathers dealt with the attacks, the mayor says:]
- a. ??Every man that has a child came to her room at night to guard her.
 - b. ??If a man has a child, he came to her room every night to guard her.

In the examples in (8), for each man's motion event, the anchor is his child, introduced by the indefinite *a child*, which is inside a scope island.

These data motivate analyzing the anchor of *come* as an anaphorically interpreted implicit argument. The anchor passes Partee (1984, 1989) and Condoravdi & Gawron's (1996) classic tests for anaphoric expressions: it can take as its antecedent an element of the context of utterance, an individual introduced by a prior linguistic expression, a quantificationally bound variable, or a donkey variable. Assuming that the anchor of *come* is anaphorically interpreted is motivated by one additional data point. In some utterances, different instances of *come* have different anchors (Fillmore 1975). Such examples are predicted if the anchor is an anaphor.

2.3 The anchoring implication is *de se*:

The data in this section show that the anchoring implication is necessarily a *de se* commitment of the anchor.⁴ This observation has its roots in Oshima's (2006b: §6) insightful discussion of embedded examples. Oshima shows that in embedded examples, the anchoring implication is necessarily a commitment of the attitude holder if the attitude holder herself is the anchor, but not otherwise. The examples in (10) illustrate.

- (10) [Context: Leslie, Andy, and Ron are in Pawnee. Ben and April are in Washington.]
- a. [Context: Ben mistakenly believes that Leslie and Andy are in Phoenix. Leslie tells Andy:]
Ben believes that April came to Pawnee last night.
 - b. [Context: Ben mistakenly believes that he himself is in Phoenix. Leslie tells Andy:]
 - (i) #Ben believes that Ron came to Washington last night.⁵
 - (ii) Ben believes that Ron came to Phoenix last night.

⁴ As far as I know, this observation is novel with respect to *come*. Antje Roßdeutscher p.c. notes that German *kommen* 'come' also involves *de se* anchoring, as discussed in Roßdeutscher 2000, lending cross-linguistic support to the claim about *come* made here.

⁵ Acceptable examples of this sort in which the place name is interpreted *de re* are discussed in §6.3.2.

In (10a), the attitude holder, Ben, is not committed to the anchoring implication. The example is nevertheless acceptable, because he is not the anchor. In contrast, in (10b-i) where Ben is the anchor, the fact that he is not committed to the anchoring implication makes the example unacceptable. Oshima further observes that if the attitude holder is the anchor, her commitment to the anchoring implication is sufficient to license the use of *come*, even if the interlocutors know the anchoring implication to be false, as in (10b-ii).

The examples in (10), particularly (10b-ii), demonstrate that the anchor's *de se* belief in the anchoring implication is sufficient to make the use of *come* acceptable. However, the examples do not show that *de se* belief is necessary for anchoring. This is demonstrated in (11) (c.f. Morgan 1970).

- (11) [Context: Last week, Chicago baseball player Ernie Banks was hit on the head. He is now a lucid amnesiac. After the accident, Ernie was transported to Boston to work with an amnesia specialist. For all he knows, he has never been to Chicago. He has been reading about the baseball player Ernie Banks, but does not realize that he is reading about himself. He reads that President Obama was in Chicago 3 weeks ago and met Ernie Banks. The doctor later tells her friend:]
#Ernie believes that President Obama came to Chicago.

In (11), the anchor, Ernie Banks, believes of Ernie Banks that he is located at the destination of the motion event. Nevertheless, (11) is unacceptable because Ernie does not realize that he believes this about himself. His belief is not *de se*. Thus, (10) and (11) reveal that what being perspectival means, at least for the meaning of *come*, is that the anchoring implication must be true *de se* according to the anchor's perspective.

This observation that the anchoring implication is a *de se* commitment of the anchor provides a rationale for the otherwise arbitrary requirement that the anchor must be an individual with a salient, relevant perspective. If the anchor's perspective is salient and relevant, then information about it is accessible to the interlocutors. When *come* is used, the fact that this information is accessible facilitates the evaluation of the anchoring implication according to the anchor's perspective.

2.4 Summary: Desiderata for an analysis of *come*

In (13a)-(13c), the empirical generalizations from the previous sections are stated as desiderata for an analysis of *come*. To these I add the observation, due originally to Fillmore (1966), that the anchoring implication has a different status than the motion implication. This claim is supported empirically by evidence from Cinque (1972) and Oshima (2006b,c), who show that the anchoring implication but not the

motion implication projects past entailment canceling operators such as negation (c.f. Langendoen & Savin 1971, Chierchia & McConnell-Ginet 1990). For just one example of projection, consider (12).

- (12) [Context: Dave is at home. Right now, he is trying to locate his brother Thomas in order to give him a surprise gift. Because the gift is a surprise, he doesn't want to let Thomas know that he's looking for him. As they talk on the phone, Dave listens for clues about Thomas's whereabouts. Thomas says:]
- a. Mom is coming to Cup-o-Joe now.
 - b. Mom is not coming to Cup-o-Joe now.
 - c. Maybe Mom is coming to Cup-o-Joe now.
 - d. If Mom is coming to Cup-o-Joe now, she didn't tell me about it.
 - e. Is Mom coming to Cup-o-Joe now?

In each example in (12), Dave will take Thomas's utterance to implicate that Thomas is at Cup-o-Joe. He will be justified in going there to find Thomas and give him the present. This judgment constitutes evidence that the anchoring implication projects. The motion implication, in contrast, does not project. If Dave were looking for their mom, he would go to Cup-o-Joe after hearing (12a), and perhaps after (12c), but not after (12b), (12d), or (12e).

The data in the previous sections, along with Cinque (1972) and Oshima's (2006b) observation that the anchoring implication projects, suggest the following desiderata for an analysis of *come*.

- (13) An analysis of *come* should
- a. include a non-ad hoc restriction limiting the domain of the anchor's antecedent to individuals with salient, relevant perspectives,
 - b. treat the anchor as an anaphorically interpreted implicit argument,
 - c. treat the anchoring implication as *de se* commitment of the anchor, and
 - d. predict that the anchoring implication projects.

In §§4-6, I develop an analysis that meets these goals using independently motivated theoretical machinery. First, I consider how previous analyses have fared with respect to these goals.

3 Previous analyses of *come*

In this section, I focus primarily on the analyses of Fillmore (1975), Oshima (2006a,c,b), and Barlew (2015b), but mention others along the way as appropriate.

3.1 Fillmore 1975

Fillmore (1966) recognizes that using *come* involves perspective-taking. However, he explicitly rejects the idea that perspective-taking is built into the meaning of *come*, preferring instead to treat it as an extra-linguistic phenomenon. Fillmore (1975) continues with this approach. He lists possible anchors in terms of grammatical person, arguably in order to illustrate a more general claim about a theoretical construct called the “deictic center”, which is taken to anchor a variety of deictic expressions. Fillmore’s list of possible anchors includes the speaker, the addressee, and “in discourse in which neither speaker nor addressee figures as a character. . . the central character” (Fillmore 1975: 67). Thus, Fillmore builds the set of possible anchors delineated in §2.1 directly into the analysis. However, he misses the generalization that these anchors are individuals with salient, relevant perspectives, or at least does not develop the analysis in terms of this generalization. As a result, Fillmore’s characterization of non-interlocutor anchors rules out some acceptable examples, including (4), where the speaker figures as a character but a non-interlocutor is nevertheless an acceptable anchor. It rules out similar examples described by Oshima (2006a), where an embedded instance of *come* is acceptable with an attitude holder as the anchor even if an interlocutor is involved in the motion event itself (e.g. *Fred wants me to come to Denver tomorrow*).

With respect to the anaphoricity of the anchor argument, Fillmore (1975) does not make a prediction, because he never makes clear exactly what the deictic center is. However, researchers following Fillmore, such as Taylor (1988), have argued that the deictic center is a Kaplanian (1989) contextual parameter. This kind of approach runs into problems with examples involving quantificational binding, since contextual parameters cannot be bound by natural language quantifiers. Finally, Fillmore (1975) makes no claims about the *de se*-ness or projection of the anchoring implication (though see Fillmore 1966 for some discussion of the latter).

3.2 Oshima 2006a,b,c

Oshima’s (2006a, 2006b, 2006c) analysis represents an improvement over Fillmore 1975 in terms of empirical coverage. Oshima (2006a) proposes that, in any given context, there is a Kaplanian (1989) contextual parameter called the **reference point** (RP), which is a set of individuals. The anchoring of *come* is analyzed as a presupposition triggered by *come* that at least one member of RP is located at the destination of the motion event at utterance time or event time, or else the destination is the home base of an RP member.⁶

⁶ Home base examples are discussed further in §7. I ignore them here.

This account automatically allows for examples in which different instances of *come* have different anchors, which Fillmore (1975: 68) calls a “horror” due to their implications for deictic center approaches. In addition, for reasons described in Oshima 2006a, it improves predictions for examples involving the presumably deictic motion verb *go*. Finally, because the anchoring implication is analyzed as a presupposition, its projective behavior falls out. However, the analysis does not account for the generalizations developed in §2, as shown in §§3.2.1-3.2.3.

3.2.1 Oshima on salient, relevant perspectives

Without additional restrictions, Oshima’s (2006a) RP account does not predict the acceptable range of anchors described by Fillmore (1975) and in §2.1: individuals with salient, relevant perspectives. To solve this problem, Oshima (2006a: 290-291) provides three constraints on membership in the RP: the speaker is always in the RP, it is preferred for the addressee to be in the RP, and another “entity can be chosen as a member of the RP if it is discourse salient”.⁷ Thus, like Fillmore (1975), Oshima essentially lists possible anchors. In addition, the approach overgenerates with respect to non-interlocutor anchors, just as Fillmore’s approach does. For example, it incorrectly predicts (14) to be acceptable.

- (14) [Context: Ann and Beth are in New York. Beth says:]
#Sarah is in Chicago right now. However, she is a Denver Broncos fan and loves quarterback Peyton Manning. Therefore, she is coming to Denver tomorrow.

In (14), Peyton Manning is discourse salient: he could be the antecedent for the pronoun *he* in a different final sentence. The theme of the motion event is not an interlocutor. Nevertheless, the example is unacceptable.

3.2.2 Oshima on quantificational binding

Because the RP is analyzed as a contextual parameter and contextual parameters cannot be bound by natural language quantifiers, quantificational examples present

⁷ These constraints apply to the RP in English only. To account for the fact that in other languages there are fewer acceptable anchors for deictic motion verbs, Oshima (2006a) assumes that languages differ with respect to the restrictions they impose on RP membership. In other words, cross-linguistic variation in the meanings of deictic motion verbs is really cross-linguistic variation in the possible values of a parameter of the context of utterance. This approach requires a radical reconceptualization of what a contextual parameter is, since on standard views the context consists of the same elements (e.g. speaker, addressee, utterance time, etc.) regardless of the language spoken. All else being equal, it would be preferable to maintain a standard view of the context and account for variation in anchoring in terms of lexical semantics of deictic motion verbs.

a difficulty for Oshima's approach, though perhaps not an insurmountable one. Oshima's analysis of the purportedly quantificational example in (15) shows that he recognizes the problem.⁸

(15) [Oshima 2006a: 288 ex. (4)]

At least two students {a. went/b. came} to talk to three professors.

Oshima (2006a: 291) accounts for (15) by stating that the RP for (15) includes, in addition to the interlocutors, all relevant professors: "RP = {speaker, addressee, professor₁, professor₂, professor₃, ...}" This move avoids including variables in the RP. Instead, it includes all of the individuals in the domain that *three* quantifies over. Technically, this approach succeeds. However, it does so by treating quantification over the anchors of deictic motion verbs differently than other quantificational phenomena. In contrast, treating the anchor as anaphorically interpreted allows for a standard treatment of quantification over anchors.

3.2.3 Oshima on *de se*-ness

Oshima's (2006a, 2006b, 2006c) analysis does not predict that the anchoring implication is a *de se* commitment of the anchor. To see why, it is useful to consider his account of examples like those in (10) in more detail. To account for such examples, Oshima (2006b) hypothesizes that (i) *come* is ambiguous between a primary indexical version and a secondary or shifted indexical version, (ii) the objects of attitudes are propositional characters, not propositions (see Kaplan 1989 on character), and (iii) attitude predicates are ambiguous, with one version that is a presupposition hole and one that is a presupposition filter.

⁸ (15) does not actually involve a quantificationally bound anchor because the anchor in (15) is in fact the interlocutors, not the professors. Consider the adapted versions below.

- (i) [Context: Jim is at the library in the center of campus, where he and his friends typically study. When Pam arrives, she notices that the area where they usually sit is virtually empty. She asks Jim why. He says:]
At least twenty students {went/#came} to talk to ten (different) professors.
- (ii) [Context: Jim and Pam are in the Linguistics Department, where things are busier than usual. Jim asks why. Pam replies:]
At least twenty students {#went/came} to talk to ten (different) professors.

In (i) and (ii), the use of *come* is acceptable just to the extent that the professors' location coincides with that of the interlocutors. The interlocutors, not the professors, anchor *come*. Oshima's example sounds good out of the blue because both kinds of contexts are easy to imagine. However, if the professors truly could be anchors, then *come* would be acceptable in (i) and *go* would be acceptable in (ii). That said, I continue to treat (15) as quantificational for the purpose of examining Oshima's proposal.

On these assumptions, in (10a), the primary indexical version of *come* is used. As a primary indexical, it necessarily appeals to the RP of the context of utterance, which is plausibly {speaker, addressee}. In this example, *believe* necessarily acts as a presupposition hole. Therefore, the anchoring implication is checked against the common ground, which entails that the speaker and the addressee are located at the destination. The example is correctly predicted to be acceptable.

In (10b), things are different. First, *believe* shifts the context, so that in the secondary context, the RP is {Ben}, the attitude holder. Then, because the objects of attitudes are propositional characters (i.e. functions from contexts to contents), the interpretation of secondary indexical *come* can depend on this most local context, rather than the context of utterance. In this case, *believe* functions as a presupposition filter, ensuring that the presupposition that an RP member is at the destination is satisfied locally, i.e. according to Ben's beliefs. This is essential, because only Ben's beliefs entail the anchoring implication. With these assumptions, the analysis correctly predicts that (10b-ii) is acceptable. If the same versions of *believe* and *come* are used in the interpretation of (10b-i), the analysis correctly predicts its unacceptability.

Of course, without some mechanism to ensure that *believe* is a presupposition hole in (10a) and a presupposition filter in (10b), the account predicts two unattested readings. Specifically, there should be a reading of (10b-i) where the secondary indexical *come* picks Ben as an element of the RP and *believe* acts as a presupposition hole, making the example acceptable. There should also be a reading of (10a) where primary indexical *come* picks an interlocutor as an element of the RP and *believe* acts as a presupposition filter, making the example unacceptable. To avoid such combinations, Oshima (2006c) posits an otherwise unmotivated syntactic feature restricting combinations of attitude predicates and deictic motion verbs to only attested readings.

This system correctly predicts that in embedded examples where the attitude holder is the anchor, her *de se* belief that she is located at the destination is sufficient to license the use of *come*. However, it does not do so by requiring the anchor to have a *de se* belief in the anchoring implication. Rather, the combination of presupposition filter *believe* and secondary indexical *come* requires the anchor to believe of herself *de re* that she is located at the destination. Thus, the anchor's *de re* belief that she is located at the destination is predicted to make the use of *come* acceptable just as her *de se* belief does. However, examples such as (11) show that this prediction is incorrect.

In essence, the main problem with Oshima's approach is that it draws the wrong conclusions from examples such as those in (10), namely that *come* is an indexical and should be treated using a direct reference theory of indexicality. However, (11) shows that the correct generalization to draw from those examples is that the anchoring implication is necessarily a *de se* commitment of the anchor. This

generalization covers the examples in (10b), and it is also appropriate for anchoring to the interlocutors, as in (10a). This is because first and second person indexicals themselves can be analyzed as having *de se*-ness as part of their meanings, following perhaps most famously Perry (1979) and Kaplan (1989). Wechsler (2010) even goes so far as to argue that the meaning of an indexical just is self-ascription (i.e. *de se* belief), and that the appearance of direct reference is epiphenomenal on facts about self-ascription and the structure of the discourse. Roberts (2014) makes a similar, though arguably less extreme, claim. On the assumption that the meanings of indexicals do at least involve self-ascription, this *de se* component, not direct reference, is what the meaning of *come* and the meanings of indexicals have in common.

In summary, Oshima's approach does not model the anchoring implication as a *de se* commitment of the anchor. As a result, it requires considerable theoretical complexity that is not independently motivated: a novel contextual parameter, the RP; a novel treatment of quantification; systematic ambiguity in the meanings of attitude predicates; systematic ambiguity in the meanings of deictic motion verbs; and a novel syntactic constraint to ensure that only acceptable combinations of attitude predicates and deictic motion verbs are licensed.

3.3 Barlew 2015b

A prima facie reasonable way to account for the generalizations in §2 is developed in Barlew 2015b. There, I propose that the anchoring implication is actually something like *the anchor believes_{de se}, that she is located at the destination of the motion event*. I assume that the anchor argument is anaphorically interpreted. This approach gets the quantificational binding cases right, and correctly predicts that the anchoring implication is a *de se* commitment of the speaker. However, (16) shows that this solution is not general enough.

- (16) [Context: Ron and Andy are in Pawnee. Ron says:]
I am imagining that I am stuck in a cabin in the Alaskan wilderness, and that I've lost my mind and think I'm in Paris. Now I'm imagining that you are coming to Alaska to rescue me.

In (16), there is no individual that believes himself to be in Alaska. Ron qua sane speaker believes himself to be in Pawnee. Ron qua character in the fantasy believes himself to be in Paris. There is, however, a perspective, construed here as a set of propositions or the intersection of such a set, that is accessible to Ron and that entails that he is in Alaska. This is Ron's fantasy. The fact that Ron imagines *de se* that he is in Alaska makes the anchoring implication true according to a perspective that Ron holds. Crucially, though, the perspective is not Ron's beliefs, but his imaginative

perspective. Including something like BELIEVE_{de se} in the meaning of *come* makes incorrect predictions for examples of this sort. Thus, no previous analysis provides a satisfactory account of the generalizations developed above.

4 A framework for the analysis of *come*

In §§4-7, I develop an analysis of *come* in the dynamic semantic framework of [AnderBois et al. \(2015\)](#) (henceforth ABH). ABH'S framework is an adaptation of dynamic predicate logic ([Groenendijk & Stokhof 1991](#)). I augment it with a mechanism for representing individuals' perspectives and perspectival content. Using this dynamic framework facilitates the analysis of both the anaphoricity of the anchor and the projective behavior of the anchoring implication. However, nothing hinges on the use of this framework in particular.

4.1 Basics of the adapted ABH framework

ABH's ontology includes domains of individuals and worlds. To these, I add space points, time intervals, real numbers, and Davidsonian events. The domains and, where applicable, associated variables are listed in (17).

(17) Basic domains:

- a. \mathcal{D} = domain of individuals
- b. \mathcal{W} = domain of worlds (w, w', \dots)
- c. \mathcal{P} = domain of space points
- d. \mathcal{E} = domain of events (e, e', \dots)
- e. \mathcal{I} = domain of intervals of time (t, t', \dots)
- f. \mathcal{R} = domain of real numbers (m, n, \dots)

ABH define a complex domain of partial individual concepts, which are partial functions from the domain of worlds into the domain of individuals. To deal with spatial elements in the meaning of *come*, I add the complex domain of regions (path-connected sets of points; see e.g. [Kracht 2002](#)) and the complex domain of paths (functions from an interval of reals to regions, following [Zwarts 2005b](#)):

(18) Complex domains:

- a. Partial individual concepts (x, y, \dots)
- b. Propositions (sets of worlds) (p, p', \dots)
- c. Regions (path-connected sets of points) (r, r', \dots)
- d. Paths (functions from intervals of reals to regions) ($\mathbf{p}, \mathbf{q}, \dots$)

ABH's ontology includes standard non-logical constants, such as JOHN, RUN, EAT, etc. An interpretation function \mathfrak{I} assigns sets of individuals as values to such non-logical constants, relative to worlds. ABH 2015:44 define \mathfrak{I} as in (19).

$$(19) \quad \forall R (n\text{-ary relation}) \forall \mathbf{w}. \mathfrak{I}_{\mathbf{w}}(R) \subseteq \mathcal{D}^n$$

I assume that \mathfrak{I} can also assign elements of domains other than \mathcal{D} as needed. For example, following Kracht (2002), the arguments of the AT relation, roughly the meaning of English *at*, include an individual (here an individual concept), a region, and a time.

Following Kamp (1981) and Heim (1982), the meaning of an expression is a context change potential. A context is represented as an information state, a set of assignments of values to variables that is compatible with what the interlocutors know. For any logical form ϕ , the interpretation of ϕ is a binary relation on an input assignment g and an output assignment h . For any such $\langle g, h \rangle$, values assigned by g are compatible with the information available prior to the interpretation of ϕ , and values assigned by h with the information available after ϕ is interpreted. The interpretation function is written $\llbracket \phi \rrbracket^{\mathfrak{M}, \langle g, h \rangle}$, where \mathfrak{M} represents the model consisting of the domains listed above. I follow ABH and omit \mathfrak{M} for readability.

ABH also include a representation of the common ground as an element of each assignment. Following Stalnaker (1973, 1978), the **common ground** (CG) is a set of propositions storing the mutual commitments of the interlocutors. The CG includes both propositions that have been uttered and accepted in the discourse and propositions representing cultural and contextual knowledge that is known to be shared. The **context set** (CS) is the set of worlds compatible with the information in the CG, i.e. the intersection of the CG:

$$(20) \quad \text{Given discourse } D \text{ with } CG_D, CS_D = \cap \{p \mid p \in CG_D\}$$

To represent the CS and thereby the CG, ABH designate a propositional variable p^{cs} to store the current CS and all of its non-empty subsets. For example, if the current CS is $\{\mathbf{w}_1, \mathbf{w}_2, \mathbf{w}_3\}$, then the current information state includes assignments that assign to p^{cs} each of the following values: $\{\mathbf{w}_1, \mathbf{w}_2, \mathbf{w}_3\}, \{\mathbf{w}_1, \mathbf{w}_2\}, \{\mathbf{w}_1, \mathbf{w}_3\}, \{\mathbf{w}_2, \mathbf{w}_3\}, \{\mathbf{w}_1\}, \{\mathbf{w}_2\}, \{\mathbf{w}_3\}$. As the discourse progresses, information is added to the CG, and worlds not compatible with that information are eliminated from the CS. This is modeled in ABH's framework by the elimination of particular assignments to p^{cs} . For example, if p is added to the CG above, and p is true only in \mathbf{w}_2 and \mathbf{w}_3 , then assignments that include \mathbf{w}_1 in the value of p^{cs} are eliminated from the context/information state. The assignments that remain assign $\{\mathbf{w}_2, \mathbf{w}_3\}, \{\mathbf{w}_2\}$, or $\{\mathbf{w}_3\}$ to p^{cs} .

ABH argue that proffered contents and at least some projective contents, such as those associated with appositives, differ because they update the CG in different ways. The two kinds of updates are **proposals** and **direct updates**.

4.2 Proposals

For ABH, every assertion includes a proposal to update the CG. The content of the proposed update itself is represented using a propositional dref p^{issue} , where “*issue*” stands for “at-issue content”. Typically, p^{issue} is reduced to p for readability. Ultimately, p represents the speaker’s intended contribution to the discourse — the content she proposes to add to the CG. However, as with any dref, when p is first introduced, its value is not restricted. Assignments to p range over the domain of propositions, $\wp(\mathcal{W})$. ABH assume that in any assertion, immediately after p is introduced, it is required to be consistent with the current CG. This requirement is represented by restricting assignments to p to subsets of p^{cs} . The requirement is a simplifying assumption enforcing monotonic update of the CG. The representation of the initial update to the context associated with an assertion is given in (21). $[]$ indicates dref introduction, and \wedge is dynamic conjunction. Interpretation brackets are included in this example, but are generally omitted for readability, except in definitions.

$$(21) \quad \text{New proposal: } \llbracket [p] \wedge p \subseteq p^{cs} \rrbracket^{(g,h)}$$

Interpreting (21) requires interpreting dynamic conjunction, which is defined in (22):

$$(22) \quad \text{Dynamic conjunction (adapted from ABH:46):}$$

Given formulas ϕ and ψ and assignments g and h , $\llbracket \phi \wedge \psi \rrbracket^{(g,h)} = \top$ iff there exists a k such that $\llbracket \phi \rrbracket^{(g,k)} = \top$ and $\llbracket \psi \rrbracket^{(k,h)} = \top$

The dynamic conjunction of two formulas ϕ and ψ is true with respect to a pair of assignments, $\langle g, h \rangle$, just in case there is some assignment k that can be an output context for the interpretation of ϕ and an input context for the interpretation of ψ , just as in standard DPL.

The interpretation of the first conjunct of (21) involves the context change associated with the introduction of the new propositional dref p . In this case, g and h differ only with respect to the value they assign to p , as in (23).

$$(23) \quad \text{Dref introduction (to be revised below; adapted from ABH: 109):}$$

Given assignments g and h , $\llbracket [p] \rrbracket^{(g,h)} = \top$ iff for any variable v (of any type) s.t. $v \neq p$, we have that $g(v) = h(v)$.

The second conjunct of (21) restricts p to a subset of p^{cs} . Dynamic versions of logical connectives such as $=$ and \subseteq are defined as conditions on the values assigned to their arguments by the output assignment. Their interpretation results in the elimination of assignments according to which the required condition does not hold. Here, $p \subseteq p^{cs}$ just in case the set of worlds h assigns to p , written $h(p)$, is a subset of $h(p^{cs})$ (see ABH: 137 for details).

Once p is introduced as in (21), assignments to p continue to be eliminated as the assertion is interpreted. In essence, the interpretation of the logical form of the assertion, call it ϕ , yields a set of conditions on assignments to p . For example, assume *he sneezed* is uttered in a context in which the dref x is the value of *he*. Then the logical form of the utterance is $\text{SNEEZE}_p(x)$. Interpreting $\text{SNEEZE}_p(x)$ updates the context to require that in all worlds that h assigns to p , x sneezed. Assignments that assign worlds to p in which x did not sneeze are eliminated. The general rule for interpreting such formulas is given in (24). It includes the presupposition in (24a), which is discussed immediately below.

(24) **Interpretation of atomic formula with predication** (adapted from ABH Appendix A: (6e) and (7)):

$\llbracket \text{SNEEZE}_p(x) \rrbracket^{(g,h)}$

- a. presupposes $h(p) \subseteq \mathbf{dom}(h(x))$ and
- b. $= \top$ iff $g = h$ and for all worlds $\mathbf{w} \in h(p)$, $h(x)(\mathbf{w}) \in \mathfrak{F}_{\mathbf{w}}(\text{SNEEZE})$

(24b) says that $\text{SNEEZE}_p(x)$ is true just in case, in all worlds \mathbf{w} that h assigns to p , x evaluated at \mathbf{w} is in the extension of SNEEZE at \mathbf{w} .

The presupposition in (24a) exemplifies one result of modeling drefs as partial individual concepts, individual concepts that are defined over only some worlds. (24a) says that for SNEEZE to be predicated of x in p worlds, x must be defined in p worlds. Therefore, in addition to introducing x , the rule for dref introduction must also specify x 's domain, as in (25).

(25) **Dref introduction** (final; adapted from ABH: 124):

Given assignments g and h and propositional dref p , $\llbracket [x_p] \rrbracket^{(g,h)} = \top$ iff

- a. for any variable v (of any type) s.t. $v \neq x$, we have that $g(v) = h(v)$,
- b. $\mathbf{dom}(h(x)) = h(p)$, and
- c. $\mathbf{dom}(h(x)) = h(p^{cs})$ if $[x_p]$ and p is the at-issue proposal.

The crucial addition in (25) is that when an individual concept dref is introduced, it is subscripted with a propositional variable p . In the general case, this propositional variable represents the domain over which x is defined, as in (25b). For linguistically introduced drefs, this is determined by the position of the introducing expression in the logical form of the utterance. For example, if an indefinite introduces a

dref x as part of an update to proposal p , then x is defined over the worlds in p . (25c) adds a special case: if p is the at-issue proposal, the domain of x is all of the worlds in p^{cs} . For justification of this special case, see ABH 2015:32-34. Briefly, the condition is necessary to allow anaphoric expressions in appositives to have antecedents introduced by e.g. indefinite NPs in main clauses. As described in detail below, on ABH's story appositives are interpreted as updates to p^{cs} . Therefore, predicates in appositives presuppose that their arguments are defined over worlds in p^{cs} . If drefs introduced in main clauses were defined only over p worlds, then they could not be antecedents to anaphoric expressions in appositives. ABH argue that this condition is not stipulative, but is motivated by general facts about discourse structure and anaphora.

(27) presents the complete translation of the update associated with the utterance in (26). (27) is understood to be the logical form of (26), given some suitable syntax-semantics interface. Different elements of the translation are written on different lines for perspicuity.

(26) Jerry sneezed.

- (27)
- a. **New proposal:** $[p] \wedge p \subseteq p^{cs} \wedge$
 - b. **Proffered:** $[x_p] \wedge x = \text{JERRY} \wedge \text{SNEEZE}_p(x) \wedge$
 - c. **Acceptance:** $[p^{cs}] \wedge p^{cs} = p$

(27a) is just standard proposal introduction from (21). The first conjunct in (27b) introduces a dref x , which is defined over all p worlds and, because p is the at-issue proposal, all p^{cs} worlds. The second conjunct sets x equal to the constant JERRY. Together, these conjuncts represent ABH's treatment of proper names. The last conjunct says that in all p worlds, x sneezed. Upon the interpretation of (27b), assignments that assign to p worlds in which Jerry did not sneeze are eliminated.

(27c) models the update to the context that occurs once an assertion is interpreted and p is fully determined. At that point, the addressee can accept or reject the assertion. If she accepts, then p^{cs} is updated, as in (27c). A new p^{cs} variable is introduced and set equal to p , thus reducing the possible assignments to p^{cs} . It is important to emphasize this step. The step is necessary because interpreting a proposal changes the context/information state but not the CG, which is represented using p^{cs} . Only acceptance of a proposal updates p^{cs} .⁹

⁹ This is not strictly correct. As discussed above, once the speaker makes an assertion the interpretation of which is p , the proposition that she asserted p is a proposition to which the interlocutors are committed and thus is part of the CG. ABH address neither this kind of update nor updates related to observable changes to the context of utterance, such as when a donkey walks in. To deal with both, it would be necessary to incorporate a mechanism for keeping p^{cs} current with observable phenomena. Since this problem is orthogonal to the analysis of *come*, I set it aside. Thanks to Peet Klecha and Craige Roberts for helpful discussion.

4.3 Direct updates

ABH’s key innovation is to assume that p^{cs} can be directly updated in the same way as p^{issue} . Recall that in (27b), the interpretation of $SNEEZE_p(x)$ restricts assignments to p to worlds in which Jerry sneezed. This restriction occurs as interpretation progresses, without requiring acceptance by the addressee. However, the addressee retains the prerogative to reject p as a proposed update to the CG and thereby leave p^{cs} unchanged. In contrast, ABH argue that interpreting an appositive results in the direct update of p^{cs} , and thus “imposes” the content of the appositive on the CG. For example, in the translation of *Jerry, who sneezed, excused himself*, the appositive *who sneezed* is represented as $SNEEZE_{p^{cs}}(x)$. Interpreting the appositive thus eliminates assignments that assign to p^{cs} worlds in which Jerry did not sneeze. In this way, the interpretation of an appositive results in a change to the CG without the addressee’s input. Following a similar move by Nouwen (2007), ABH assume that the conventional content of the comma intonation associated with appositives shifts the propositional variable being updated from p to p^{cs} .

Differentiating direct updates to p^{cs} from updates via proposals has nice results. First, on the assumption that that p , the proposal, contains all at-issue content, appositives are not-at-issue because they do not contribute to p .¹⁰ Second, combined with a suitable analysis of entailment canceling operators, analyzing appositives as direct updates to p^{cs} predicts that they project. To see why, consider ABH’s analysis of entailment canceling operators as exemplified by sentential negation in (28).

(28) Sentential negation (adapted from ABH:46):

- $$\begin{aligned} & \llbracket \text{NOT}_p^{p'}(\phi) \rrbracket^{(g,h)} = \top \text{ iff} \\ & \text{a. } \llbracket \mathbf{max}^{p'}(\phi) \rrbracket^{(g,h)} = \top \text{ and} \\ & \text{b. } h(p) \cap h(p') = \emptyset \end{aligned}$$

In (28), p is the update proposal that negation is part of, and p' is a new propositional dref introduced by negation.¹¹ p' stores the content of the material embedded under negation, ϕ , just as p stores the content of the assertion. Negation places two requirements on the output context, h , relative to p' . The first, given in (28a) using the **max** relation, is that h assigns to p' the maximal set of worlds compatible with the interpretation of ϕ . **max** is defined in (29).

¹⁰ The at-issueness data are actually more complicated. See ABH, Koev 2013, Nouwen 2014, and Martin To appear for discussion.

¹¹ If negation is embedded, p is the propositional dref introduced by the embedding operator.

- (29) ABH's (2005:46) **max**: $\llbracket \mathbf{max}^{p'}(\phi) \rrbracket^{(g,h)} = \top$ iff
- $\llbracket [p'] \wedge \phi \rrbracket^{(g,h)} = \top$ and
 - there is no h' s.t. $\llbracket [p'] \wedge \phi \rrbracket^{(g,h')} = \top$ and $h(p') \subsetneq h'(p')$

The second condition imposed by negation is represented in (28b). (28b) requires that in the output assignment there is no overlap between p' worlds and p worlds. Since p' stores the embedded content, this means that the proposed update p consists entirely of worlds where that content is false. If the utterance is accepted, updating p^{cs} with p eliminates worlds in the CS where the negated content is true.

The translation of (30) in (31) shows how the analysis accounts for projection.

(30) Jerry, who is an employee, did not sneeze.

- (31) a. **New proposal**: $[p] \wedge p \subseteq p^{cs} \wedge$
 b. **Proffered**: $[x_p] \wedge x = \text{JERRY} \wedge \text{NOT}_{p'}^{p'}($
 c. **Appositive**: $\text{EMPLOYEE}_{p^{cs}}(x) \wedge$
 d. **Proffered ctd.**: $\text{SNEEZE}_{p'}(x))$
 e. **Acceptance**: $[p^{cs}] \wedge p^{cs} = p$

In (31b), the final conjunct introduces the new propositional variable p' . Then, in (31d), $\text{SNEEZE}_{p'}(x)$ is an update to p' , making all worlds in p' worlds where Jerry sneezed. Due to the condition on the interpretation of NOT in (28b), limiting p' in this way forces p to contain only worlds where Jerry did not sneeze. Even though the appositive is embedded under sentential negation, the appositive content remains $\text{EMPLOYEE}_{p^{cs}}(x)$ in (31c) due to the conventional content of the comma intonation. Embedding does not change the appositive's contribution to the CG. The entailment that Jerry is an employee projects.

5 Modeling salient, relevant perspectives in ABH's framework

The data in §2 show that the anchoring implication is a *de se* commitment of the anchor. That is to say, it holds according to the anchor's own perspective. Therefore, to model the anchoring implication I introduce a mechanism for representing the information the interlocutors share about the perspectives of individuals. This requires a representation of the perspective holder and a representation of the perspective itself. For the most part, I focus on doxastic perspectives, not hopes, imaginings, etc. With this simplifying assumption, a perspective holder is just an individual capable of having a doxastic state, and a perspective is just a doxastic state (Roberts 2014). However, I assume that the approach can be generalized to account for all kinds of perspectives, and indicate how from time to time.

5.1 Perspective holders in discourse

For a theory of what it means to be a perspective holder, I borrow from [Stalnaker \(2008\)](#) and [Roberts \(2014\)](#). Following [Lewis \(1979\)](#), Stalnaker represents belief as an accessibility relation on centered worlds. The center of a centered world consists of a subject (a doxastic agent capable of belief) and a time, represented as $\langle A, t \rangle$. A centered world is the pair of a center and a world: $\langle \langle A, t \rangle, w \rangle$. Stalnaker's doxastic accessibility relation, R , is given in (32):

- (32) **Doxastic accessibility** (adapted from [Stalnaker 2008: 70](#)):
 Given a doxastic agent A , individual A' , times t and t' , and worlds w and w' , $\langle \langle A, t \rangle, w \rangle R \langle \langle A', t' \rangle, w' \rangle$ iff it is compatible with what A believes at t in w that she is A' at t' in w' .¹²

The doxastic state of an agent can be defined as a set of centered worlds, as in (33), adapted from [Roberts \(2014: 29-32\)](#).

- (33) **Doxastic state:** Given a base centered world $\langle \langle A, t \rangle, w \rangle$,
 $\text{DOX}(\langle \langle A, t \rangle, w \rangle) = \{ \langle \langle A', t' \rangle, w' \rangle \mid \langle \langle A, t \rangle, w \rangle R \langle \langle A', t' \rangle, w' \rangle \}$

Stalnaker defines R in such a way as to make the removal of the centers in (33) possible. He adds to the definition of R the * condition, which requires that ignorance of where in the world one is is a type of ignorance about which world one is in. It says that for any worlds w and w' and individuals A , B , and C , if $\langle \langle A, t \rangle, w \rangle R \langle \langle B, t' \rangle, w' \rangle$ and $\langle \langle A, t \rangle, w \rangle R \langle \langle C, t' \rangle, w' \rangle$, then $B = C$. Removing the centers leaves just a set of worlds. This makes it possible to model the complements of attitude predicates as (uncentered) propositions and thus to compare beliefs across subjects, who may “share” belief worlds but not centers.

To include centers and centered worlds in the current framework, I add the additional complex domains in (34)-(35).

- (34) **The domain of centers:**
 Let \mathcal{C} be the domain of centers, such that for all $c \in \mathcal{C}$, $c = \langle x, t \rangle$, where x is a partial individual concept (a dref) and $t \in \mathcal{T}$.
- (35) **The domain of centered worlds:**
 Let \mathcal{U} be the domain of centered worlds, such that for all $u \in \mathcal{U}$, $u = \langle \langle x, t \rangle, w \rangle$, where $\langle x, t \rangle \in \mathcal{C}$ and $w \in \mathcal{W}$.

[Roberts \(2014\)](#) proposes using Stalnaker-style centers as drefs for perspective holders. She argues that the interlocutors keep track of a limited set of such centers.

¹² Stalnaker requires R to be transitive, Euclidean, and serial.

Specifically, they keep track of centers corresponding to individuals whose doxastic states are immediately relevant in the discourse. The set always includes centers for the interlocutors at utterance time, since their views are always relevant for the construction of the CG. It also includes a center for any doxastic agent whose perspective is overtly at-issue, such as the agent of an attitude predicate or the agent whose point of view is adopted in an FID context. Roberts calls drefs for centers with relevant perspectives **discourse centers**.¹³ The principal empirical domains she considers are indexicals (Roberts 2014) and epistemic modals (Roberts 2015). However, the theory is intended to be applicable to perspectival expressions in general. Perspectival expressions, Roberts argues, are those that involve anchoring the content of an expression to a dref that is co-referential with a discourse center.

I define the set of discourse centers in (36). \mathbb{C} is a variable over discourse centers. \mathbb{C}_D is the set of all discourse centers for discourse D.

(36) **Discourse centers** (adapted from Roberts 2014: 35):

The set of discourse centers \mathbb{C}_D in discourse D:

$\mathbb{C}_D \subseteq \{\langle x, t \rangle \mid \langle x, t \rangle \in \mathfrak{C} \text{ and } x\text{'s beliefs at } t \text{ are relevant in } D\}$.¹⁴

- a. \mathbb{C}_D always includes distinguished centers corresponding to the speaker at utterance time, \mathbb{C}^* , and the addressee at utterance time, $\mathbb{C}^@$.
- b. Additional centers are introduced lexically. For example, the meaning of an attitude predicate introduces a center corresponding to the attitude holder at the event time of holding the attitude.
- c. Additional centers are introduced pragmatically, as in FID.

(36) reveals the connection between Roberts' independently motivated discourse centers and the anchoring of *come*: the set of possible discourse centers is exactly the set of possible anchors. Thus, on the assumption that the anchor of *come* is a discourse center, the observed range of anchors described in §2.1 falls out without additional stipulation. Modeling the anchor of *come* as an anaphorically retrieved discourse center thus satisfies desiderata (13a) and (13b) using independently motivated technology.

5.2 Perspectives in discourse

If a perspective holder is represented as a discourse center, how is the information that the interlocutors share about that center's perspective represented? What kind

¹³ Readers interested in how the set of discourse centers evolves as the discourse progresses are referred to Roberts 2014. The introduction and removal of discourse centers introduced by attitude predicates is discussed in detail and modeled formally in this paper, in §6.3.

¹⁴ This is relevance to the question under discussion, as defined in Roberts (1996/2012).

of information is it? For a doxastic perspective, the information is just the sum of what the interlocutors know about the center's beliefs. To define this information, it is necessary to type lift the DOX function defined in (33). In (33), DOX maps an individual, a time, and world to a set of centered worlds. What is needed now is a mapping from an individual, a time, and a set of worlds to a set of centered worlds:

- (37) **Doxastic perspective:** Given discourse center \odot and set of worlds q ,
 $DOX'(\odot, q) := \{\langle \langle x', t' \rangle, w' \rangle \mid \exists w \in q[\langle \odot, w \rangle R \langle \langle x', t' \rangle w' \rangle]\}$.

Applying DOX' to a discourse center and set of worlds is equivalent to combining the center with each world in the set, applying DOX to each resulting centered world, and finding the union of those results.

$DOX'(\odot, h(p^{cs}))$ returns the set of centered worlds that represents what the interlocutors know about the doxastic perspective of \odot . For any discourse center \odot , $DOX'(\odot, h(p^{cs}))$ is entailed to exist by the CG. This is the case even if not much is known about \odot 's beliefs, because interlocutors make certain default assumptions about doxastic agents in general. For example, they assume that a doxastic agent believes that she herself exists, that the sky is blue, etc., unless these beliefs are directly contradicted. Therefore, for any \odot , a dref representing that center's doxastic state relative to each assignment h , is weakly familiar, where being weakly familiar means being entailed to exist by the CG (Roberts 2002, 2003).

For any given discourse center, additional perspectives held by that center may also be familiar, depending on the context. For example, a center's imaginings, hopes, or fears might be under discussion and therefore familiar. Following Heim (1992), Roberts (1996), and Anand (2011), I assume that these perspectives are hypothetical doxastic states, which is to say particular kinds of manipulations of an agent's doxastic state. They are therefore of the same type as a doxastic state: a set of centered worlds. For any discourse center \odot , then, I assume there to be a set of familiar perspectives, $\{v^\odot \mid v^\odot \text{ is a perspective entailed by the CG to be held by } \odot\}$. This set may be a singleton whose only member is \odot 's doxastic state, but it may also include additional perspectives.

It is also possible to represent a perspective as simply a set of uncentered worlds, due to Stalnaker's * condition. For any perspective v^\odot , such an uncentered perspective is entailed to exist, as shown in (38).

- (38) Given discourse center \odot and perspective v^\odot , there exists some uncentered perspective q^\odot , such that $q^\odot = \{w' \mid \langle \langle x', t' \rangle w' \rangle \in v^\odot\}$

This entailment makes it possible to compare perspectives, and to treat them as simple propositional variables in ABH's system.

Centers and perspectives of the sorts defined here can be used to model *de se* phenomena (Lewis 1979, Stalnaker 2008), as illustrated in (40). (40) contains Roberts’s (2014: 30) informal logical forms for the *de se* and non-*de se* interpretations of (39), where *he* is co-referential with *Ernie Banks*.

- (39) Ernie Banks believes he is a great shortstop.
- (40) a. ***de se***: $\text{believe}(\langle eb, \mathbf{w} \rangle) \subseteq \{ \langle \odot, \mathbf{w}' \rangle \mid \odot \text{ is a great shortstop in } \mathbf{w}' \}$
 b. ***non-de se***: $\text{believe}(\langle eb, \mathbf{w} \rangle) \subseteq \{ \langle \odot, \mathbf{w}' \rangle \mid eb \text{ is a great shortstop in } \mathbf{w}' \}$

On the *de se* interpretation, Ernie knows that he believes himself to be a great shortstop. (40a) shows that in this case the antecedent for the pronoun *he* is the dref for the (agent of the) center at each of the centered worlds in Ernie’s doxastic state, i.e. who Ernie believes himself to be. On the non-*de se* interpretation, Ernie has amnesia, and believes that Ernie Banks is a great shortstop without believing that he himself is Ernie Banks. As a result, there is no identification between the centers and the antecedent of *he*.

To represent *de se* phenomena in the current system, I designate a variable for a perspective holder’s *de se* self-conception. A self-conception is an individual concept dref defined over all of a perspective holder’s perspectively accessible worlds. The dref maps each such world to the individual who the perspective holder takes herself to be at that world, i.e. the agent coordinate of the center at that world. This dref is defined by generalizing over the centers of the centered worlds comprising the perspective. For example, in a doxastically accessible centered world $\langle \langle x', t' \rangle, w' \rangle$, x' is the individual concept that maps w' to whoever the perspective holder believes herself to be in at t' in w' . The SELF function, defined in (41), generalizes over these individual concepts and creates a single individual concept x^\odot such that, for any set of centered worlds, x^\odot is defined over all worlds in the set and maps each world to the same individual concept that its center maps it to.

- (41) Given a discourse center \odot and a perspective v^\odot held by \odot ,
 $\text{SELF}(v^\odot) := \lambda x^\odot. \forall \langle \langle x', t' \rangle, w' \rangle [\langle \langle x', t' \rangle, w' \rangle \in v^\odot \rightarrow h(x^\odot)(w') = h(x')(w')]$

(41) defines the unique dref x^\odot that always returns who \odot takes herself to be in each world in the relevant perspective. When $v^\odot = \text{DOX}'(\odot, h(p^{cs}))$, x^\odot is the individual concept that represents who \odot believes herself to be, according to the interlocutors’ shared understanding of her beliefs.

With these tools to model perspectives, it is possible to use ABH’s direct update technology to target an individual’s perspective. Meanings that directly update the information that the interlocutors share about someone’s perspective can be analyzed as eliminating assignments that assign particular values to p^\odot . They can “impose” their content on the interlocutors’ shared conceptualization of some individual’s

perspective. Of course, this also results in an imposition on the common ground, but the information imposed is perspectival: it has to do with how the relevant individual understands the world.

This proposal — that the interlocutors keep track of individuals’ perspectives and that the meanings of particular expressions encode information about individuals’ perspectives — is not new. Gunlogson (2001, 2002) argues that the interlocutors keep track of, in particular, what they know about each other’s perspectives. Gunlogson’s proposal has proven useful for analyses of a wide range of phenomena, such as declaratives with rising intonation, specific indefinites, and appositives (Farkas 2002, Farkas & Bruce 2010, Lauer 2013, Koev 2013, 2015). The current proposal simply extends this idea, on the assumption that the interlocutors also track information about the perspectives of other individuals, in particular those whose perspectives are immediately relevant, following Roberts (2014).

6 The meaning of *come*

To analyze the meaning of *come*, it is necessary to model the path of the motion event. I adopt an analysis of paths as sets of directed locations, following Zwarts (2005b). More concretely, a path \mathbf{p} is a function from an interval of reals, $[m, \dots, n]$ to locations in space, where $\mathbf{p}(m)$ is the startpoint and $\mathbf{p}(n)$ is the endpoint. Following Zwarts (2005b), the denotation of a PP is a set of paths with particular attributes. For example, *to x* denotes the set of paths that begin outside x , make exactly one transition to being at x , and end at x , as defined in (42) and schematized in (43).

(42) the meaning of *to x*: $\{\mathbf{p} \mid \text{there is an interval } I \subset [m, n] \text{ including } n \text{ and consisting of all the } i \in [m, n] \text{ for which } \mathbf{p}(i) \text{ is at } x\}$.

(43) Schematic representation of (42): $\{- - - + + + \}$, where $-$ is an interval where the theme is not at x and $+$ is an interval where the theme is at x .

The denotation of *to* is translated into ABH’s system in (44). Path drefs are treated on a par with partial individual concepts by being relativized to sets of worlds.

(44) $\llbracket \text{TO}_p(\mathbf{p}, x) \rrbracket^{(g, h)} = \top$ iff $g = h$ and for all $\mathbf{w} \in h(p)$, $h(\mathbf{p})(\mathbf{w})$ is a path such that there is an interval $I \subset [m, n]$ including n and consisting of all the $i \in [m, n]$ for which $\mathbf{p}(i)$ is at $h(x)(\mathbf{w})$.

Other PPs have similarly structured denotations, but place different conditions on the paths (see Zwarts 2005b for details).

Only a few additional standard assumptions are needed to model the motion implication of *come*. First, following Talmy (1985), MOVE is a basic motion predi-

cate. Second, following Zwarts (2005b), there is a function TRACE such that, for every motion event, e , TRACE(e) returns the path of the theme of e . With these assumptions, it is possible to model the motion implication of *come* as in (45), where \mathcal{P} is a PP denotation.

$$(45) \quad \text{The motion implication of } come: \llbracket \text{COME}_p(x, \mathcal{P}) \rrbracket^{(g,h)} = \top \text{ iff} \\ \llbracket [e_p] \wedge \text{MOVE}_p(x, e) \wedge \mathcal{P}_p(\text{TRACE}(e)) \rrbracket^{(g,h)} = \top$$

According to (45), the motion implication is just that the theme of the motion event moves along the path denoted by the PP with which *come* combines. (45) treats this PP as an argument of *come*. Nothing in the motion implication justifies this, since predicating \mathcal{P} of TRACE(e) would also be the result of combining the meaning of *come* with an adjunct PP (Zwarts 2005b). However, the way in which the PP's meaning contributes to the anchoring implication, which is discussed below, provides motivation for this treatment.

6.1 A path to the anchor's location?

To this point, I have characterized the anchoring implication as the implication that the anchor is located at the destination of the motion path. The examples in this section show that this characterization is too narrow. In fact, the requirement on the anchor's location depends on the PP with which *come* combines. As a result, to understand the anchoring implication, it is necessary to understand a bit more about the meanings of different kinds of PPs.

First, a **goal-PP** is one where the object of the preposition denotes the goal (or endpoint) of the path. Similarly, a **source-PP** is one where the object denotes its source (or startpoint). Second, following Zwarts (2005b), a PP is either **bounded**, **unbounded**, or ambiguous between the two. Boundedness is defined formally in terms of cumulativity, as discussed below. Here, a pre-theoretical idea based on related concepts in the nominal and verbal domains will suffice. As in those domains, boundedness can be diagnosed by observing the effect that a PP has on verbal aspect (e.g. *John walked to the farm {in/*for} one hour*; see Zwarts 2005b for extended discussion). There is not a direct correlation between source/goal orientation and boundedness, which is to say that both source and goal PPs can be bounded and unbounded.

The first generalization is that the anchor must be at the destination of the motion path when *come* combines with a bounded goal-PP or bounded source-PP. The *to*-PPs in §2, plus (46) and (47), illustrate.

- (46) Bounded goal-PPs:
a. Tom came onto the roof.

- b. Ann came into the office.
- (47) Bounded source-PPs:
- a. April came off the roof.
 - b. Andy came out of the office.

For the examples in (46) to be acceptable, the anchor must be on the roof and in the office, respectively. In (47), she must be off the roof or out of the office. Importantly, it is not necessary for the anchor's location to be the actual end of the motion path. For example (47a) can be uttered by an anchor located across the street from the house April was on the roof of, even if April never crosses the street after descending. In such a case, April's path never reaches the anchor's location. However, both the endpoint of her path and the anchor's location can be described as being *off the roof*. Similarly, examples such as *John came to Denver last week when I was there, but I didn't see him* make it clear that the motion path need not reach the anchor's actual location. Instead, the PP denotation specifies a location in which the endpoint of the path must be located (e.g. in Denver), and the anchoring implication requires that the anchor be located in a similarly described location. However, the path need not touch the anchor's location. Examples of this sort motivate treating the PP as a complement of *come*. A general analysis of the combination of motion verbs and adjunct PPs such as that in Zwarts 2005b cannot account for this meaning.

The second generalization involves **route-PPs**, e.g. *through the tunnel* and *across the river*. With route-PPs, the anchor's location can be either the destination of the entire path or the location of the reference object, e.g. in the tunnel for the route-PP *through the tunnel*. Both are illustrated in (48).

- (48) a. [Context: Leslie and Ron are in Denver. Leslie says:]
Tammy came through Denver on her way from Ohio to California.
- b. [Context: Leslie and Ron are in California. Leslie says:]
Tammy came through Denver on her way from Ohio to California.

There is a way to unify this observation with the requirement on bounded goal and source-PPs discussed above. Every path *through Denver* can be thought of as the combination of two subpaths: one that could be described by the bounded goal-PP *to Denver* and another that could be described by the bounded source-PP *away from Denver*. The meaning of *come* requires that the anchor's location be at the end of one of these two bounded subpaths.¹⁵

¹⁵ *Come* also combines with PPs that are ambiguous between bounded and unbounded meanings, such as *around the house*, and unambiguously unbounded PPs, such as *toward the house*. For the former, composition with *come* forces a bounded reading. With respect to the latter, the semantics of e.g. *toward*-PPs has yet to be worked out (see Zwarts 2005b for a couple of possibilities). On at least

This result suggests that the anchor's location can be defined in terms of bounded subpaths of the motion path. The trick is to define the anchoring implication in such a way as to pick out the appropriate bounded subpaths of source, goal, and route-PPs alike. To do that, I define a relation between a set of paths \mathcal{P} (i.e. a PP denotation) and a path \mathbf{p} , which I will call an **anchoring subpath**. Doing so involves the subpath relation, concatenation function, and cumulativity relation, all defined following Zwarts (2005b):

- (49) Subpath (notated \leq) is a relation between paths \mathbf{p} and \mathbf{q} , such that $\mathbf{p} \leq \mathbf{q}$ if \mathbf{p} is the same path as \mathbf{q} but restricted to only part of \mathbf{q} 's domain.
- (50) Concatenation is a partial function from pairs of paths, \mathbf{p} and \mathbf{q} , to paths, $\mathbf{p}+\mathbf{q}$. \mathbf{p} and \mathbf{q} can be concatenated to make $\mathbf{p}+\mathbf{q}$ just in case the endpoint of \mathbf{p} is the startpoint of \mathbf{q} and $\mathbf{p}+\mathbf{q}$ is a path that begins at the startpoint of \mathbf{p} and ends at the endpoint of \mathbf{q} .
- (51) Cumulativity: Given a set of paths \mathcal{P} , \mathcal{P} is cumulative just in case
- there are paths \mathbf{p} and \mathbf{q} in \mathcal{P} such that $\mathbf{p}+\mathbf{q}$ exists and
 - for all \mathbf{p} and \mathbf{q} in \mathcal{P} , if $\mathbf{p}+\mathbf{q}$ exists it is also in \mathcal{P} .

Cumulativity is the property underlying boundedness. A set of paths is bounded if it is non-cumulative.

Because it underlies boundedness, cumulativity can be used to pick out the anchoring subpaths of a set of paths:

- (52) Given a set of paths \mathcal{P} , the anchoring subpaths of $\mathcal{P} = \{\mathbf{p} \mid \exists \mathbf{q} [\mathcal{P}(\mathbf{q}) \wedge \mathbf{p} \leq \mathbf{q} \wedge \nexists \mathbf{p}' [\mathcal{P}(\mathbf{p}') \wedge \mathcal{P}(\mathbf{p}+\mathbf{p}')]]\}$

The best way to see the effect of this definition is with a specific example such as (53), where $y = \text{DENVER}$:

- (53) The anchoring subpaths of the set of paths to $y = \{\mathbf{p} \mid \exists \mathbf{q} [\text{TO}(\mathbf{q}, y) \wedge \mathbf{p} \leq \mathbf{q} \wedge \nexists \mathbf{p}' [\text{TO}(\mathbf{p}', y) \wedge \text{TO}(\mathbf{p}+\mathbf{p}', y)]]\}$

Which paths \mathbf{p} are picked out by (53)? First, each is the subpath of some path to Denver. Second, each is such that it cannot be concatenated with another path to Denver to yield a path that is also to Denver. For any path to Denver \mathbf{q} , this eliminates all of the subpaths of \mathbf{q} that are entirely outside Denver. This is because any subpath \mathbf{p} that ends outside Denver can be concatenated with a path to Denver \mathbf{p}' to yield a path $\mathbf{p}+\mathbf{p}'$ that is also itself a path to Denver. Thus, the set of anchoring subpaths includes all of the subpaths that are themselves paths to Denver or paths that fall

one option, the denotation of a *toward*-PP is similar to that of a *through*-PP. If that is right, then the analysis extends unproblematically. For now, I leave the topic to future research.

entirely inside Denver. This is the desired result, since all of these paths end at a location in Denver, i.e. an acceptable location for the anchor.

This formulation also returns correct anchoring subpaths for route-PPs, as shown in (55), which depends on the analysis of *through*-PPs in (54), adapted from Zwarts (2005b: 763).

(54) $\llbracket \text{through Denver} \rrbracket = \{ \mathbf{p} : \text{there is an interval } I \subseteq [m, n] \text{ that includes neither } m \text{ nor } n \text{ and that consists of all the } i \in [m, n] \text{ for which } \mathbf{p}(i) \text{ is in Denver.} \}$
Schematically: { - - - + + + - - - }

(55) The anchoring subpaths of the set of paths through y , where $y = \text{DENVER}$:
 $\{ \mathbf{p} \mid \exists \mathbf{q} [\text{THROUGH}(\mathbf{q}, y) \wedge \mathbf{p} \leq \mathbf{q} \wedge \nexists \mathbf{p}' [\text{THROUGH}(\mathbf{p}', y) \wedge \text{THROUGH}(\mathbf{p} + \mathbf{p}', y)]] \}$

Because \mathbf{p} is a subpath of a path through Denver \mathbf{q} , it is either a path through Denver, just like \mathbf{q} (schematically: { - - - + + + - - - }), a path to Denver ({ - - - + + + }), a path out of Denver ({ + + + - - - }), a path that lies purely inside Denver ({ + + + }), or a path that lies purely outside it ({ - - - }). The final conjuncts of (55) eliminate two of these options. First, they eliminate the possibility that \mathbf{p} is a path that is purely outside Denver. For every such subpath \mathbf{p} , there is a path through Denver \mathbf{p}' that starts where \mathbf{p} ends and continues through Denver. Second, it prevents \mathbf{p} from being a subpath that is itself a path through Denver, i.e. a subpath with the structure { - - - + + + - - - }. This is because every path through Denver ends outside Denver, which means that it can be concatenated with another path \mathbf{p}' that goes (back) through Denver, yielding a path that goes through Denver twice and thus is in the denotation of (pluralized) *through Denver*. Thus, the final conjunct requires \mathbf{p} to be a subpath of John's motion path that is to Denver, out of Denver, or completely within Denver: { - - - + + + }, { + + + - - - }, or { + + + }. Each such path has its endpoint in one of two places: in Denver or at the end of a path leading out of Denver. These are exactly the two locations that are acceptable locations for the anchor, just as desired.

Translating this content into ABH's system yields the following definition of A-PATH, the anchoring (sub)path relation.

(56) $\llbracket \text{A-PATH}_{q^\circ}(\mathbf{p}, \mathcal{P}) \rrbracket^{(g,h)} = \top$ iff $g = h$ and
a. $\llbracket [\mathbf{q}_{q^\circ}] \wedge \mathcal{P}_{q^\circ}(\mathbf{q}) \wedge \mathbf{p} \leq \mathbf{q} \rrbracket^{(g,h)} = \top$ and
b. there is no j s.t. $\llbracket [\mathbf{p}'_{q^\circ}] \wedge \mathcal{P}_{q^\circ}(\mathbf{p}') \wedge \mathcal{P}_{q^\circ}(\mathbf{p} + \mathbf{p}') \rrbracket^{(h,j)} = \top$

The condition in (56a) ensures that the anchoring subpath, \mathbf{p} , is the subpath of some path in denotation of the PP-complement. Then (56b) ensures that it is a subpath of the right sort, i.e. with its endpoint in one of the appropriate anchoring locations.

Imagining for a moment that the anchoring implication is neither perspectival nor projective, it is possible state the meaning of *come* as in (57).

- (57) Non-perspectival version of *come*: $\llbracket \text{COME}_p(\mathcal{P}, x) \rrbracket^{(g,h)} = \top$ iff
- a. **Motion implication:**
 $\llbracket [e_p] \wedge \text{MOVE}_p(x, e) \wedge \mathcal{P}_p(\text{TRACE}_p(e)) \rrbracket^{(g,k)} = \top$ and
 - b. **Anchoring implication:**
 $\llbracket [\mathbf{p}_p] \wedge \text{A-PATH}_p(\mathbf{p}, \mathcal{P}) \wedge \text{AT}_p(x, t, \mathbf{p}(n)) \rrbracket^{(k,h)} = \top$, where x is a dref for the anchor, and t is utterance time or event time.

(57a), representing the motion implication, is just (45), which says that the theme of the motion event moves along a path of the sort that satisfies the PP denotation. (57a) is separated from the anchoring implication in (57b) for perspicuity, but the result is equivalent to joining the two using dynamic conjunction. (57b) introduces a path dref, \mathbf{p} , which is an anchoring subpath with respect to the PP complement. The final conjunct of (57b) says that the anchor is located the endpoint of \mathbf{p} at either utterance time or event time. Given the way the A-PATH function is defined, this ensures that the anchor's location is appropriate for making *come* acceptable.

The inclusion of the A-PATH relation in the meaning of *come* represents a significant advance over previous analyses, though not one related to the central concerns of this paper. This is because previous analyses either informally require (Fillmore 1975) or formally encode (Oshima 2006b, Barlew 2015b) that the anchor's location is the final destination of the motion event described using *come*. As a result, they make incorrect predictions for examples involving route-PPs such as (48a). The present account draws on Zwarts's (2005a) independently motivated algebra of paths to define the A-PATH relation, thereby making correct predictions about these examples with route-PPs and goal-PPs.

6.2 Anchoring *come* in matrix clauses

Since the anchor argument of *come* is anaphorically retrieved, the first step in analyzing anchoring is to define the anaphoric presuppositions of *come*. These are given in (58a). They are followed in (58b-i) by the proffered content of *come* developed above, and by the anchoring implication itself in (58b-ii). Thus (58) comprises the lexical entry for *come*. Each aspect of (58) is discussed below.

- (58) Lexical semantics of *come*:
- a. **Presupposition:** For any context g , property of paths \mathcal{P} , and individual concept x , $\llbracket \text{COME}_p(\mathcal{P}, x) \rrbracket^{(g,h)}$ is defined iff there is some familiar discourse center \odot with a familiar perspective v^\odot .
 - b. $\llbracket \text{COME}_p(\mathcal{P}, x) \rrbracket^{(g,h)} = \top$ iff
 - (i) **Proffered content:**
 $\llbracket [e_p] \wedge \text{MOVE}_p(x, e) \wedge \mathcal{P}_p(\text{TRACE}_p(e)) \rrbracket^{(g,k)} = \top$ and
 - (ii) **Anchoring implication:**
 $\llbracket [\mathbf{p}_{q^\odot}] \wedge \text{A-PATH}_{q^\odot}(\mathbf{p}, \mathcal{P}) \wedge \text{AT}_{q^\odot}(x^\odot, t, \mathbf{p}(n)) \rrbracket^{(k,h)} = \top$,
 where t ranges over utterance time and event time.

The presupposition triggered by the use of *come* is given as a definedness condition on the input context, g . It requires there to be a familiar discourse center, \odot , and a familiar (centered) perspective, v^\odot , such that v^\odot is accessible to the agent of \odot at the time of \odot . The perspective argument is stated independently because in some cases anchoring depends on a perspective other than beliefs. Finally, the existence of \odot and v^\odot entails the existence of the uncentered version of v^\odot , q^\odot , and the centers of worlds in v^\odot , x^\odot , as described in §5.

Once again, the proffered content of *come* is just (45). However, unlike in the previous section, the anchoring implication is now relativized to the perspective of the anchor. (58b-ii) says that according to the anchor's own perspective, q^\odot , the anchor's *de se* counterpart, x^\odot , is located at the end of an anchoring subpath at utterance time or event time.¹⁶ To achieve this switch to the anchor's perspective, I assume that something like the meaning Nouwen (2007) and ABH attribute to comma intonation is embedded in the meaning of *come*. In this case, however, it toggles the update to the anchor's perspective, not the CG. As a result, the anchoring implication updates the anchor's perspective directly.¹⁷ By ensuring that the anchoring implication

¹⁶ It is orthogonal to the purpose of this paper to account for the fact that these two times are the only possibilities, so I simply stipulate them as an informal condition in (58b-ii), following Fillmore (1975). That said, I see two choices. The first is just to assume that these two times are lexically specified, following Oshima (2006b). The alternative is to appeal to a more general process such as anaphora resolution. On this kind of account, utterance time and reference time are expected to be possible values of t , given that both play important roles in interpretation and can therefore be assumed to be salient. The difficult task for such an account is ruling out other salient times as possible antecedents. I thank an anonymous S&P reviewer for helpful comments on this question, and leave it for future work.

¹⁷ Nothing hinges on modeling the anchoring implication in this way. The technology developed here could as easily be used to model the anchoring implication as a presupposition that must be satisfied according to the anchor's perspective (i.e. that must be entailed by the perspective). In that case, the anchoring implication would be represented as a condition on g , similar to that in (58a). I adopt the direct update approach for two reasons. First, assuming that some presuppositions are satisfied according to a particular individual's perspective rather than according to the common ground (absent

is evaluated according to the anchor's own perspective, the present account thus satisfies desideratum (13c).

(60) shows how the meaning of *come* composes with its arguments by presenting the translation of (59).

- (59) [Context: The speaker is the only possible anchor.]
John came to Denver.
- (60) Translation of (59), ignoring tense:
- New proposal:** $[p] \wedge p \subseteq p^{cs} \wedge$
 - Proffered:** $[x_p] \wedge x = \text{JOHN} \wedge [y_p] \wedge y = \text{DENVER} \wedge$
 - Motion:** $[e_p] \wedge \text{MOVE}_p(x, e) \wedge \text{TO}_p(\text{TRACE}(e), y) \wedge$
 - Anchoring:** $[\mathbf{p}_{q^{\odot*}}] \wedge \text{A-PATH}_{q^{\odot*}}(\mathbf{p}, \lambda \mathbf{p}.\text{TO}(\mathbf{p}, y)) \wedge \text{AT}_{q^{\odot*}}(x^{\odot*}, t, \mathbf{p}(n))$
 - Acceptance:** $[p^{cs}] \wedge p^{cs} = p$

In (60b), drefs for John and Denver are introduced. Then the motion implication is given in (60b) as part of the proposed update to the common ground, p . Next, the anchoring implication is added as a direct update to the perspective of the anchor, here the speaker.

The lexical entry in (58) correctly predicts that the anchoring implication projects when *come* is embedded under an entailment canceling operator. This is illustrated in the translation of (61) in (62).

- (61) John did not come to Denver.
- (62) Translation of (61), ignoring tense:
- New proposal:** $[p] \wedge p \subseteq p^{cs} \wedge$
 - Proffered:** $[x_p] \wedge x = \text{JOHN} \wedge [y_p] \wedge y = \text{DENVER} \wedge \text{NOT}_p^{p'} ($
 - Motion:** $[e_{p'}] \wedge \text{MOVE}_{p'}(x, e) \wedge \text{TO}_{p'}(\text{TRACE}(e), y) \wedge$
 - Anchoring:** $[\mathbf{p}_{q^{\odot*}}] \wedge \text{A-PATH}_{q^{\odot*}}(\mathbf{p}, \lambda \mathbf{p}.\text{TO}(\mathbf{p}, y)) \wedge \text{AT}_{q^{\odot*}}(x^{\odot*}, t, \mathbf{p}(n))$
 - Acceptance:** $[p^{cs}] \wedge p^{cs} = p$

In (62b), drefs for John and Denver take wide scope due to the way in which proper names are interpreted. The remainder of the content of the utterance scopes under

embedding under an attitude predicate and/or modal subordination) would entail a fairly significant modification to standard views of presupposition. Second, modeling the meaning of *come* in this way makes it easier to show how the account extends to non-speaker-oriented appositives, which are also perspectival (Amaral et al. 2007, Harris & Potts 2009, Koev 2015). That said, if a presuppositional analysis of the anchoring of *come* is ultimately preferable, it can be represented in the framework developed here without additional modifications and without any consequences for the extension, which is described in §8. Thanks to associate editor Kjell Johan Sæbø and two anonymous S&P reviewers for helpful discussion of this point.

negation. This means that the proffered content of *John came to Denver* is stored in p' , the propositional dref introduced by the NOT operator.¹⁸ Therefore, p' consists of all of the worlds compatible with the CG in which John travels to Denver. Then, the interpretation of negation ensures that p , the update to the context set, contains no such worlds. As a result, if the update is accepted, then the context set consists only of worlds in which John did not travel to Denver. None of this affects the anchoring implication, which is a direct update to the anchor's perspective. It projects. Thus, the present account satisfies desideratum (13d).

6.3 Deictic perspective shift and attitude predicates

The data in §2.2 illustrate two kinds of deictic perspective shift: in FID contexts and under attitude predicates. In FID contexts, deictic perspective shift is just a matter of discourse anaphora resolution. Therefore, translations of such examples look exactly like the translation of the speaker anchored example in (60), but with a different center. Deictic perspective shift under attitude predicates is different, because the centers introduced by attitude predicates are available only in the scope of the attitude, unlike interlocutor and FID centers. To account for this local availability, in §6.3.1 I develop an analysis of attitude predicates in ABH's framework that (i) is compatible with the treatment of belief above and (ii) accounts for the introduction of local discourse centers and thus local perspectives. §6.3.2 analyzes different types of examples in which *come* is embedded under attitude predicates.

6.3.1 Attitude predicates

The proffered content of *believe* is given in (63) and discussed immediately below.

- (63) *believe*: $\llbracket \text{BEL}_{p'}^{p'}(x, t, \phi) \rrbracket^{(g, h)} = \top$ iff
- a. $\llbracket \mathbf{max}_{p(x, t)}^{p'}(\phi) \rrbracket^{(g, h)} = \top$ and
 - b. $\{\mathbf{w}' | \langle \langle x', t' \rangle, \mathbf{w}' \rangle \in \text{DOX}'(h(p), \langle h(x), h(t) \rangle)\} \subseteq h(p')$

The BEL operator in the meaning of *believe* introduces a propositional variable p' . As with the NEG operator, p' stores the content of ϕ , the logical form of the embedded clause. x is a dref for an individual concept, which corresponds to the subject of *believe*. t is the event time for the believing eventuality.

(63a) employs an adaptation of the **max** function defined in (29) above. As in (29), here **max** introduces a novel propositional dref, p' . However, unlike **max**

¹⁸ Technically, in (69c), drefs and predicates should be written without subscripts, because the propositional dref subscript is contributed when p' is introduced in the interpretation of **max** in the meaning of negation. Here and in §6.3, I include subscripts for maximum clarity.

above, the here **max** is relativized to $p^{\langle x,t \rangle}$, the perspective of the agent of *believe* at belief time, in a way to be made explicit in (65) below. Before considering (65), note that both $p^{\langle x,t \rangle}$ and its associated local discourse center, $\langle x,t \rangle$, are introduced due to a presupposition triggered by *believe*, which is given in (64).

- (64) **Presupposition of *believe***: For any context g , individual concept x , time t , and formula ϕ , $\llbracket \text{BEL}_p^{p'}(x,t,\phi) \rrbracket^{\langle g,h \rangle}$ is defined iff there is some familiar dref $p^{\langle x,t \rangle}$ such that, for all \mathbf{w} in $g(p)$,
- $$g(p^{\langle x,t \rangle}) = \{ \mathbf{w}' \mid \langle \langle x',t' \rangle, \mathbf{w}' \rangle \in \text{DOX}'(g(p^{cs}), \langle g(x), g(t) \rangle) \}$$

According to (64), *believe* presupposes that there is a familiar information state, $p^{\langle x,t \rangle}$, that stores x 's beliefs at t in every world in the update proposal, p . (64) requires $p^{\langle x,t \rangle}$ to be the beliefs of x at t according to the CG. In essence, this means that (64) requires the context to entail something about x 's beliefs. This presupposition is trivially satisfied for any suitable agent of belief by default assumptions about all doxastic agents, as discussed in §5.2. It is important to note, however, that although all doxastic agents are assumed to have beliefs, no discourse center $\langle x,t \rangle$ exists prior to the use of the attitude predicate. This is because the attitude event time is needed to define the t component of the discourse center — to specify the time at which x 's beliefs are beliefs.

Once $p^{\langle x,t \rangle}$ is anaphorically retrieved, the adaptation of **max** defined in (65) uses it to constrain the value of p' , which stores the content of the embedded clause.

- (65) **max** (revised): $\llbracket \mathbf{max}_{p^{\langle x,t \rangle}}^{p'}(\phi) \rrbracket^{\langle g,h \rangle} = \top$ iff
- $\llbracket [p'] \wedge p' \subseteq p^{\langle x,t \rangle} \wedge \phi \rrbracket^{\langle g,h \rangle} = \top$ and
 - there is no h' s.t. $\llbracket [p'] \wedge p' \subseteq p^{\langle x,t \rangle} \wedge \phi \rrbracket^{\langle g,h' \rangle} = \top$ and $h(p') \subsetneq h'(p')$

(65a) requires p' to be a subset of $p^{\langle x,t \rangle}$, x 's beliefs at t . Otherwise, **max** has the same function as ABH's **max**. It requires p' to store the maximal set of worlds compatible with what is already known about x 's beliefs and in which ϕ , the embedded content, holds.

The requirement that $p' \subseteq p^{\langle x,t \rangle}$ means that existence presuppositions encoded in ϕ must be satisfied in worlds in $p^{\langle x,t \rangle}$. This requirement is motivated by examples involving the anaphoric presuppositions of pronouns embedded under *believe*. Heim (1992), following observations by Karttunen, shows that these can be satisfied according to the beliefs of the attitude holder. An adaptation of one of Heim's classic examples is given in (66).

- (66) Stanley mistakenly believes he has a cello. He believes it is a Stradivarius.

In the current system, the embedded content of the second utterance of (66) is just $\text{STRADIVARIUS}_{p'}(z)$, where z is the translation of *it*, and p' is the propositional variable storing the content of the embedded clause. For $\text{STRADIVARIUS}_{p'}(z)$ to be felicitous, z must be defined over p' worlds. The anaphoric presupposition of *believe* ensures that it is. **max** in (65) requires p' to be a subset of Stanley's anaphorically retrieved doxastic state, $p^{(x,t)}$. The first utterance of (66) guarantees that there is a dref for a cello that is defined over all of those worlds, and thus over all worlds in p' .¹⁹ In addition, note that it is necessary to assume that drefs defined over worlds in p^{cs} are available under attitudes in order to allow *de re* interpretations (see ABH: 126 for discussion).

The presupposition in (64), and the adaptation of **max** in (65) account for the introduction of a new discourse center as part of interpreting an utterance with *believe*. The discourse center's perspective is relevant in the embedded context because p' , the dref storing the content of ϕ , is a subset of $p^{(x,t)}$, which stores the center's perspective. Thus, the interpretation of particular expressions in ϕ , including for example anaphoric expressions, involves using information in $p^{(x,t)}$. $p^{(x,t)}$ and its center are relevant in this way only in the scope of the attitude and any subsequent modal subordination environments.

The second condition in the meaning of *believe*, repeated as (67), is essentially Stalnaker's (2008) definition of belief, expressed using the DOX' function.

$$(67) \quad \{\mathbf{w}' | \langle \langle x', t' \rangle, \mathbf{w}' \rangle \in \text{DOX}'(h(p), \langle h(x), h(t) \rangle)\} \subseteq h(p')$$

(67) requires that for every world that h assigns to p , the update proposal, the worlds that are doxastically accessible to x are worlds in which p' holds. In other words, the proposed update is that x 's beliefs entail p' . If the utterance is accepted, then the CS is reduced to p , so the common ground entails that x 's beliefs entail p' .

6.3.2 Come under attitudes

This section analyzes two cases. The first, exemplified in (68), consists of examples in which *come* is embedded under *believe* but is nevertheless interlocutor anchored. Such an example is given in (68) and analyzed in (69).

- (68) [Context: The interlocutors are in Denver, but Mary does not know this. However, she just told the speaker that, as far as she knows, John traveled to Denver.]
Mary believes John came to Denver.

¹⁹ If other attitude predicates such as *hope* and *wish* are assumed have presuppositions similar to (64), then the current system gets results similar to Heim's (1992). Presuppositions of content embedded under those predicates are satisfied according to the commitments of the attitude holder.

- (69) Translation of (68), ignoring tense:
- a. **New proposal:** $[p] \wedge p \subseteq p^{cs} \wedge$
 - b. **Proffered:** $[z_p] \wedge z = \text{MARY} \wedge [x_p] \wedge x = \text{JOHN} \wedge [y_p] \wedge y = \text{DENVER} \wedge \text{BEL}_p^{p'}(z, t,$
 - c. **Motion:** $[e_{p'}] \wedge \text{MOVE}_{p'}(x, e) \wedge \text{TO}_{p'}(\text{TRACE}(e), y) \wedge$
 - d. **Anchoring:** $[\mathbf{p}_{q^{\odot*}}] \wedge \text{A-PATH}_{q^{\odot*}}(\mathbf{p}, \lambda \mathbf{p}.\text{TO}(\mathbf{p}, y)) \wedge \text{AT}_{q^{\odot*}}(x^{\odot*}, t, \mathbf{p}(n)))$
 - e. **Acceptance:** $[p^{cs}] \wedge p^{cs} = p$

(69) predicts that (68), if accepted, updates the context with the information that Mary believes John traveled to Denver. Modeling the anchoring implication as in (69d) correctly predicts that it is a commitment of the speaker, and that the attitude holder need not know anything about it. She can falsely believe that the interlocutors are elsewhere, and (68) is still acceptable.

The second type of example involves deictic perspective shift under attitudes, as in (70), which is translated in (71).

- (70) [Context: Mary (in San Diego) believes that she is in Denver. Jeremy, in San Jose, tells Amy about Mary's delusion (that she is in Denver). Then he says:]

Mary believes that John came to Denver.

- (71) Translation of (70), ignoring tense:
- a. **New proposal:** $[p] \wedge p \subseteq p^{cs} \wedge$
 - b. **Proffered:** $[z_p] \wedge z = \text{MARY} \wedge [x_p] \wedge x = \text{JOHN} \wedge [y_p] \wedge y = \text{DENVER} \wedge \text{BEL}_p^{p'}(z, t,$
 - (i) **Motion:** $[e_{p'}] \wedge \text{MOVE}_{p'}(x, e) \wedge \text{TO}_{p'}(\text{TRACE}(e), y) \wedge$
 - (ii) **Anchoring:** $[\mathbf{p}_{q^{(x,t)}}] \wedge \text{A-PATH}_{q^{(x,t)}}(\mathbf{p}, \lambda \mathbf{p}.\text{TO}(\mathbf{p}, y)) \wedge \text{AT}_{q^{(x,t)}}(x^{(x,t)}, t, \mathbf{p}(n)))$
 - c. **Acceptance:** $[p^{cs}] \wedge p^{cs} = p$

(71) shows that there is a sense in which, in examples involving deictic perspective shift, the motion implication and the anchoring implication target the same set of worlds for update: the worlds compatible with the agent/anchor's beliefs, $p^{(x,t)}$. The motion implication does so as part of a proposal to update the CG in a way that restricts $p^{(x,t)}$ to worlds in which John traveled to Denver. The anchoring implication directly updates $p^{(x,t)}$ so that it includes only worlds in which Mary is in Denver.

This observation provides an alternative explanation for a claim made by Oshima (2006b), which is that the anchoring implication does not seem to project when *come* is embedded and the attitude holder is the anchor. On the present account, the implication still projects. It just appears not to project because it updates the same set of worlds as the non-projective embedded content.

The present approach also makes an interesting correct prediction, due to the way in which it separates the motion implication and the anchoring implication. The prediction is that if the anchor's location is indicated using a definite description, it can be interpreted *de re*, i.e. relative to the global context or *de dicto*, i.e. according to the anchor's beliefs. Technically, this will be represented in the logical form by allowing either definite description (*de re*) or the attitude predicate *de dicto* to take wide scope. The present account predicts that both possibilities should be acceptable, provided the location is where the anchor believes herself to be *de se*. The examples in (72) illustrate that this is correct.

- (72) [Context: Jane is in a mental hospital. She believes that she lives in Buckingham Palace, due to persistent hallucinations. Each week, her brother visits her, and she gets very upset if he is unable to do so. This week, he was not able to visit. However, his son impersonated him and visited Jane. Upon returning home, the son says:]
- a. Don't worry, Dad. I did a good job impersonating you. Aunt Jane thinks you came to the {hospital/palace} this week like usual.
 - b. Don't worry, Dad. Even though I wasn't able to impersonate you successfully, Aunt Jane was happy that I came to the {hospital/palace} this week, so everything's ok.

Both *the hospital* and *the palace* are acceptable in the examples in (72) for two reasons. First, both are used to refer to the place that Jane believes herself to be *de se*. This is clear because she believes that she interacts with the son at that place, regardless of whether she would call it the *the hospital* or *the palace*. Second, the place in question is at the end of the end of the father's imagined motion path in (72a), which goes to the palace and exists only in Jane's mind, and the son's actual motion path, which goes to the hospital.

The analysis of anchoring presented here also generalizes to other attitudes if those attitudes are assumed to include an anaphoric presupposition similar to that in the meaning of *believe*. For other attitudes, it is also necessary to assume that the antecedent for their anaphorically retrieved perspective might consist of something other than beliefs. This is necessary not just for *come* but for presupposition satisfaction generally, as shown in (73) (see Heim 1992).

- (73) Stanley wishes he had a cello. He wishes he could sell it for a high price.

In (73), the antecedent of *it* is defined over worlds compatible with Stanley's wishes. The antecedent information state for the second *wish* is necessarily the one made salient during the interpretation of the first utterance. Developing analyses of other attitude predicates in the current framework is a task for future work.

7 A variety of anchors and anchoring relations

In the interest of simplicity, so far I have focused on uses of *come* that are acceptable because the anchor is at an appropriate anchoring location at either utterance time or event time. However, there are other relations between the anchor and the destination that can license the use of *come*. Two additional anchoring relations noted by Fillmore (1975) are illustrated in (74).

- (74) [Context: Ann and Beth are in Gambier, Ohio. Ann says:]
 I went to see Professor Smith in Lupton Hall earlier today. While I was there, John came to Lupton to meet with Professor Rogers.
- a. **The destination is the anchor's home base:**
 John came {to my house/to Gambier} earlier today, but I wasn't home.
 - b. **The motion is in the company of the anchor:**
 John came to North Carolina with me last month.

I assume that motion in the company of the anchor, as illustrated in (74b), is a special case of motion to the anchor's destination at event time, and say no more about it.²⁰

I also contend that home base cases are a special type of motion to the anchor's location at event time, but I make this case in more detail. To understand how home base examples work, it is useful to first consider clearer examples of the special type of anchoring proposed. Two are given in (75) and (76). In (75) and (76), the anchor is not located at the destination of the motion event and is not said to believe, imagine, etc. herself to be.

- (75) [Context: Ann is a spy. She says:]
 Yesterday, I put a hidden video camera in a tree overlooking a meadow in a Moscow park. The next day Vladimir Putin came to the meadow to meet with an associate. I was watching from our base miles away.
- (76) (from Fillmore 1975: 67) [Context: The speaker is not on the island.]
 There on the uninhabited island, waves lap upon the shore. Pine trees stand tall against the wind. Occasionally a loon comes to the island to roost.

In (75) the only plausible anchor is the speaker. However, the speaker is not located at the end of an anchoring subpath at event time or utterance time, nor does she believe herself to be. In (76), there seems to be no plausible anchor at all. The

²⁰ In fact, things are more complicated. By traveling to North Carolina with John, the speaker can serve as the anchor for a use of *come* describing John's motion. However, a speaker in Ohio cannot report her own trip to North Carolina by saying *I came to North Carolina alone last month*. Ultimately, some rule must be formulated to prevent self-anchoring in such examples. However, nothing in the present account hinges on how this rule is formulated.

current analysis appears unable to account for such examples because there is no agent with whose perspective the anchoring implication is compatible. The same problem arises, *ceteris paribus*, for examples in which motion is to the anchor's home base. Home base examples are acceptable even when the anchor is not at home.

To account for these cases, I appeal to a kind of anchoring for epistemic modals described by [Kratzer \(2012\)](#). Kratzer argues that epistemic modals require a contextually supplied body of information (technically a function from a context to such information) as a modal base. Usually, the modal base is a body of information known to be accessible to some agent(s). However, Kratzer provides examples in which the modal base is determined by a contextually salient body of information that is not the doxastic or epistemic state of any agent. For instance, in one of her examples it is the information available in a locked filing cabinet ([Kratzer 2012: 98-99](#)). The generalization over these examples is that if the context makes a body of information salient enough, lexical items with meanings that generally involve information connected to particular agents can be interpreted with respect to this body of information instead.

I propose that in (75) and (76), the content of the discourse raises the salience and relevance of particular bodies of information, which, if taken to represent the perspective of some agent, verify the anchoring implication. In (75), the camera provides a view of the destination location. Thus, the speaker has the visual perceptual access she would if she were located at the destination. In (76), by giving a physical description of the island, the speaker indicates that she has perception-like access to the destination. This perception-like access is similar to an imagination state in which the anchor imagines herself at the destination. In general, then, if the anchor indicates that she perceives or imagines how things are at the destination location, she indicates that she can also imagine herself being there.

This characterization of anchoring in these examples is supported by the connection between direct perception and imagination discussed by e.g. [Recanati \(2007\)](#) and [Stephenson \(2010\)](#). They argue that direct perception and *de se* imagining are phenomenologically similar and are encoded similarly in the meanings of linguistic expressions. If this is right, examples such as (75) and (76) both involve deictic perspective shift to an imagination state in which the anchor imagines herself to be at the destination. The shift is signaled by the overt representation of the relevant imagination state itself rather than the use of an attitude predicate. [Smith \(2009\)](#) discusses similar examples of perspectival shift without attitude predicates as part of a general account of perspective-taking.

This approach also provides a way to think about home examples. Following [Goddard \(1997\)](#), possible home bases include not just the anchor's home, but also any location where the anchor is stereotypically assumed to spend a lot of time, such

as her work or school. (77), adapted from [Goddard 1997: 157](#), exemplifies the home base anchoring to a place of employment.

- (77) [Context: The interlocutors work at the shop, but are not there now.]
It's a pity John's coming to the shop tomorrow, when neither of us will be there.

The range of possible home bases suggests that a home base is a place that the anchor knows well enough to picture. If this is right, then even more than (75) and (76), home base examples are like Kratzer's filing cabinet example. In a home base example, the actual content of the imagination state is not provided. Rather, its existence is assumed in virtue of the stereotypical relation between anchors and their home bases.

If this analysis turns out to be correct, it is an additional reason to prefer the present approach over previous analyses, which include the anchor's home base as part of disjunctive list of possible anchoring locations. However, nothing in the present account hinges on this approach to home base examples. If it turns out to be incorrect, the anchoring implication can simply be augmented with a function HOME from an individual to her home base(s) and a disjunct allowing these to be possible locations of $\mathbf{p}(n)$, following [Oshima \(2006b\)](#).

8 Conclusion: Towards a general theory of perspectival content in discourse

The data presented in this paper motivate treating the anchoring implication of *come* as perspectival content, which is to say content that is true relative to some individual's perspective, not the common ground. The supplement to ABH's system developed here makes it possible to model this content as a direct update to an individual's perspective, or alternatively, as a presupposition that must hold according to that perspective. Either way, the point is that perspectival information is a special kind of contextual information, and the meanings of perspectival linguistic expressions make use of it.

To show how this system constitutes a step toward a general framework for analyzing perspectival content, I close with a brief sketch of a perspectival analysis of the meanings of appositives, in particular non-speaker-oriented appositives. Following [Amaral et al. \(2007\)](#), [Harris & Potts \(2009\)](#), [Roberts \(2014\)](#), and [Koev \(2015\)](#), non-speaker-oriented appositives are interpreted as commitments of an individual with a salient, relevant perspective, rather than commitments of the speaker. As a result, non-speaker-oriented appositives and speaker-oriented appositives appear to yield two different kinds of update to the common ground. A speaker-oriented appositive with content q is usually claimed to update the common ground with q

(Potts 2005; ABH). In contrast, an appositive oriented to some individual x , updates the common ground with something like ‘ x believes q ’, as in (78).

- (78) Mary is crazy. She believes that everyone in our neighborhood is an alien disguised as a human. Often, she engages us in conversation and tries to trick us into revealing where we stand in the alien hierarchy. She even keeps a chart like you see in police movies in her bedroom, with each neighbor’s picture and presumed role in the hierarchy. Mr. Rogers, who is the alien overlord, hates these conversations so much that he told me he’s thinking of moving. I’m not supposed to breathe a word of it to Mary, because he’s afraid it might make her talk to him even more.

In (78), the content of *who is the alien overlord* is attributed to Mary, not the speaker. The CG is updated with the content that Mary believes Mr. Rogers is the alien overlord.

For ABH, following Harris & Potts (2009) non-speaker-oriented appositives involve pragmatic context shift. This shift occurs when a pragmatically supplied agent takes the place of the speaker as the agent of the context. Koev (2015) makes a similar proposal for non-speaker-oriented appositives under attitude predicates, arguing that attitude predicates shift the agent parameter of the context to the attitude holder. However, neither kind of context shifting can account for (78). In (78) there is neither an attitude predicate nor a general agent shift. Mary cannot be the speaker-like agent for e.g. the penultimate sentence, because the final sentence shows that Mary is not committed to its proffered content. She is committed to merely the content of the appositive.

The system developed here allows for a unified, perspectival analysis of non-speaker-oriented appositives, such as the one in (78), and speaker-oriented appositives. First, assume that in (78) there is a pragmatically introduced discourse center corresponding to Mary due to the immediate relevance of her perspective in the discourse. Call this discourse center \odot^M , and let her doxastic perspective be represented as p^M . Now, assume that the conventional content of comma intonation presupposes an anaphorically retrievable perspective $dref$, and shifts the propositional variable being updated to that perspective, just like the related element in the meaning of *come*. In (78), p^M is retrieved from the context, and the content of the appositive is a direct update to p^M . The translation of the appositive is $ALIEN-OVERLORD_{p^M}(x)$, where x is a $dref$ set equal to Mr. Rogers. Directly updating p^M in this way eliminates from the context all assignments that assign worlds to p^M in which Mr. Rogers is not the alien overlord. This does not update the CG with $ALIEN-OVERLORD(x)$, the content of the appositive itself, but rather with the equivalent of ‘Mary believes $ALIEN-OVERLORD(x)$ ’.

Crucially, this approach generalizes to speaker-oriented appositives. Following Koev 2015, speaker-oriented appositives can be analyzed as updating the speaker's perspective, $p^{\odot*}$. This move unifies the analyses of speaker-oriented and non-speaker-oriented appositives. The apparent update of the CG with the appositive content, call it q , which Potts (2005) and ABH seek to account for, is then analyzed as arising due to pragmatic rather than semantic factors, following general discourse principles described by Lauer (2013). Lauer notes that if the addressee believes the speaker to be both honest and informed, any content that is added to the speaker's commitments is reflexively accepted by the addressee unless she has specific reasons to disagree. As a result, that content becomes a mutual belief of the interlocutors, i.e. part of the CG. Thus, updating $p^{\odot*}$ with q ultimately does result in q being added to the CG, just due to pragmatic principles rather than conventional content.

In sum, the approach to perspectival content advocated here is based on a Stalnakerian view of the discourse context. It also follows recent work (e.g. Farkas & Bruce 2010, Lauer 2013, Roberts 2014) and assumes that perspectival content plays a significant role in both the structure of the discourse and the interpretation of particular expressions. Since both general discourse principles such as those discussed by Lauer (2013) and the lexical semantics of particular expressions such as *come* make use of perspectival information, it makes sense to assume that the interlocutors keep track of such information just as they keep track of the common ground. This paper formally models how they do that by embedding central elements of Roberts's (2014) theory of doxastic perspectives in AnderBois et al.'s (2015) dynamic semantics. The analysis of *come* based on this approach both makes better empirical predictions than previous accounts and establishes, for the first time, an explicit connection between the lexical semantics of *come* and the intuition that its interpretation involves adopting a particular perspective. More importantly, by embedding elements of Stalnaker (2008) and Roberts's (2014) theories in AnderBois et al.'s (2015) semantics, this paper takes the first steps toward creating a formal framework for the analysis of perspectival content in general, in the spirit of Mitchell 1986.

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