

RESEARCH

Perspective and the future-in-the-past

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The paper investigates the *future-in-the-past* (FiP) as in *Peter would (later) see the Fujiyama*. FiP can convey an outlook on events that, as the speaker knows, took place later (“objective sense”). FiP can also convey a past utterance or thought of a protagonist. In this perspective-taking sense, FiP sentences share the uncertainty about the future of present tense *will*-sentences. Kaufmann’s (2005) semantic treatment of the future is extended to account for shifted senses of the future-in-the-past, leading to the insight that tense scopes differently in non-shifted and shifted future-in-the-past. A final outlook speculates about more radical changes in the analysis of tense and aspect in order to account for this observation.

Keywords: future; perspective; free indirect discourse; tense; aspect

1 Introduction

The present article investigates a particular form of perspective taking in English as illustrated in (1).

(1) Peter smiled. He would soon see the Fujiyama.

The second sentence can be interpreted as free indirect discourse where it conveys a thought of Peter: *I will soon see the Fujiyama*. Intuitively, the past-in-the-future tense conveys Peter’s perspective.

While past thoughts of protagonists like (1) have been described as instances of free indirect discourse before, we know to date little about the semantic ingredients of this form of perspective-taking. The paper aims to provide a semantic analysis of (1) that captures the perspective coded in the future-in-the-past. This analysis should rest first on a semantic treatment of the future and second an analysis of perspective taking that can account for (1). The particular challenge becomes clear when we compare (1) in the reading (1a) taking Peter’s perspective with (1b) in its “objective” sense.

(1) a. Peter smiled. He thought: I will soon see the Fujiyama.
b. Peter smiled. (What he did not know then but I know now is:) He would see the Fujiyama.

Both readings are about Peter’s future at the time of his smile. Yet, they rest on different persons’ beliefs and times. Whereas Peter’s thought in (1a) covers all future possibilities that Peter held possible *at the time of the smile*, the speaker’s assertion in (1b) filters out those future possibilities that the *speaker* holds possible *now*. The two readings thus have different doxastic timelines: the possible futures of Peter rest on Peter’s beliefs in the past in (1a) but on the speaker’s present belief in (1b). This leads to puzzling facts that have

fuelled philosophical discussions around the so-called “sea-battle”-example that goes back to Aristotle.¹

While we do not recapitulate this discussion here, the long philosophical history of the data foreshadows that in spite of the simplicity of the data, the analysis of future, past and perspective is not trivial and more than a simple consequence of existing theory. One of the most sophisticated treatments of the *will*-future, Kaufmann (2005), serves as the basis in the present exploration. It is superior to other accounts because Kaufmann explicitly discusses the objective future-in-the-past. The paper is structured as follows: Section 2 surveys future-in-the-past data and readings and argues in favour of a modular analysis in terms of *woll* and PAST tense. Section 3 briefly summarizes Kaufmann’s (non-perspective-taking) analysis of future *will/would* which serves as our starting point. Section 4 points out a shortcoming of Kaufmann and proposes a revised analysis of *woll*. Section 5 extends the analysis to perspective-taking in free indirect discourse. Section 6 integrates the resulting analysis in a larger treatment of perspective shift in free indirect discourse. Section 7 summarizes and discusses. An appendix with all definitions and semantic derivations allows the reader to check the formal details of the account.

2 Past futurate: A window into future events

English uses the *will* + infinitive form to talk about future events. The form is matched by a corresponding past *would* + infinitive form to report about events that are in the future of a past reference time. This is exemplified in (2) and (3).

- (2) Peter is leaving the camp. He will soon see the Fujiyama.
 (3) Peter left the camp. He would soon see the Fujiyama.

Example (2) takes the utterance time *now* as its reference time R and asserts that an event E of ‘Peter seeing the Fuji’ takes place later than *now*. The reference time in example (3) is in the past, at the time of ‘Peter leaving the camp’. The second sentence reports an event E of ‘Peter seeing the Fuji’ after R. Intuitively, tense marking and future combine in a transparent manner. We will follow Abusch (1997, 1998) and assume that an underlying verb *woll* contributes a future tense relation and combines freely with present and past tense to yield *will* or *would*. While the *will*-future has been extensively discussed in formal semantics (Condoravdi 2003; Kaufmann 2005; Copley 2008, 2014; Giannakidou & Mari 2013; Del Prete 2014) the past form receives less attention and is often viewed as a standard case of past tense. Kaufmann (2005) poses an exception in that he explicitly discusses the future-in-the-past.² His analysis thus serves as the basis of the present paper. The corresponding German *würde* + infinitive has been described as the *Futur Präteritum* (Thieroff 1992; Zifonun et al. 1997; Welke 2005) but remains without formal analysis. I adopt the term *future-in-the-past* from Leech (1987: Section 84).

Example (3) can also be interpreted as a thought by Peter when he leaves the camp. This perspective shift is also known as *free indirect discourse* (FID), and the future-in-the-past can be an indicator of free indirect discourse. Perspective shifts are even more obvious when the assertion about the future depends on the subjective beliefs and emotions of the protagonist, like in (4).

- (4) Peter left the camp full of hope. He would propose to Sue, he would marry her and live happily for the rest of his life.

¹ See the online Stanford Encyclopedia of Philosophy, *Future Contingents*, for an overview.

² Other accounts may in principle be suited to extend to past-in-the-future but all remain unspecific in many details that are necessary to cover the form. I do not want to burden the paper with a list of open issues in Condoravdi (2003), Copley (2008, 2014), Giannakidou et al. (2013) or del Prete (2014).

The content of the sentence reports Peter's beliefs about the future which may or may not be borne out by the actual course of events. The future-in-the-past in (4) takes the epistemic perspective of the protagonist and we will refer to such uses of the past futurate as *shifted* or *perspectivized* use.

The non-shifted or *objective* use of the future-in-the-past occurs frequently in history books or biographies where the narrator has complete knowledge and offers a preview of events-to-come. The following example was taken from an online biography of the US criminal John Dillinger:

- (5) Later as the Carrolls emerged from a nearby restaurant, the police approached. Carroll went for his gun but one of the officers knocked it from his hand. As he began to run he was shot four times. *He would later die in the hospital.* The ranks of the Dillinger gang were thinning.

The narrator keeps *R* at the time of the shooting, previewing the eventual death of Carroll. I will refer to such uses as *objective* use of past futurate.³ The paper explores how a suitable analysis of the verb *will*, past and present tense, and perspective shift can account for the objective (non-shifted) as well as the perspectivized (shifted) interpretation of sentences in the future-in-the-past.

Before moving on, let me relate the study to an alternative road that could be pursued. It is often claimed that English has a zero PAST tense in embedded speech and it could be hypothesized that PAST in free indirect discourse is an instance of zero past. Yet, I follow Banfield (1983) who was the first to point out that sentences in free indirect discourse share the syntactic properties of non-embedded sentences. Given that zero PAST has to be licensed by an embedding predicate, an analysis in terms of zero PAST may look attractive semantically but poses additional costs in terms of new syntactic stipulations. An alternative analysis along these lines might be feasible but a full exploration is left for future research.

3 Kaufmann (2005)

The present section reviews the core ideas of Kaufmann (2005). Details will be glossed over wherever possible, but the Appendix offers all necessary definitions in Kaufmann (2005) for easier reference. Kaufmann explicates how modality, temporal relations and utterance point interact in the *will*-future, building on the idea in Thomason (1984) that the future involves branching world-time-lines. In order to decide whether a sentence is true, we have to fix a world (*where* it is true) and a time (*when* it is true). For instance, *Peter leave-the camp* can be true at one time and false at another. Likewise, it can be true in one world at *t* but false in another. Therefore Kaufmann assumes that propositions are evaluated in world-time pairs or indices $i = \langle w, t \rangle$. These indices are connected by temporal and modal relations.

Temporal order. Two indices can be related in time: $\langle w, t \rangle < \langle w', t' \rangle$ with *t* before *t'*. Temporal ordering is only defined for indices that share their world, which means that every world comes with a time line $\langle w, t_1 \rangle, \langle w, t_2 \rangle, \dots$. The idea that the same world can develop into different futures is captured by making use of an equivalence relation \approx . At each time *t*, this relation tells us which worlds "look the same" at *t* in that they share all facts at *t*, notated as $w \approx_t w'$. If two worlds look the same at time *t*, then they share a common past, which is captured by the following condition: If $w \approx_t w'$ and $t' < t$ then $w \approx_{t'} w'$. The idea is that as time goes by, worlds *w* and *w'* that hither looked the same

³ The use of this label does not entail that I take all narrators as objective sources of unshakable truth. The narrator reports the event (here: Carroll's death) with the same assertoric force and commitment to truth as the events of the police approaching, Carroll reaching for his gun and so on.

can diverge in t develop different futures at some later time t_1 . Kaufmann's model makes sure that any two equivalent indices i, i' share the same basic facts (see his definition of a *history model*).

Modal accessibility. Indices can not only be related in time but also in modal space. A relation R between indices is called a modal relation if any two related indices share the same time. If $R(i, i')$ then the time of i is the same as the time of i' (thus $i = \langle w, t \rangle$ and $i' = \langle w', t \rangle$) We thus assume that an index i can only be an epistemic, doxastic, metaphysic etc. alternative of i' if the two indices code two worlds at the same time. The most important modal relations are doxastic and metaphysic accessibility.

Doxastic alternatives code the idea that we have imperfect knowledge about the world that we live in. Two indices i, j are doxastic alternatives for subject A , notated as $i \sim_A j$, if as far as A can tell, he could be living in i or in j . This does not mean that i and j are indistinguishable or that A is unable to distinguish them. If $i \sim_A j$, the indices i and j differ in respects where A does not know what the real world's facts are. In a temporal model, the doxastic alternatives of A extend into the past. If i or j could be A 's world and $i' < i, j' < j$ are in the past of either (and i', j' share their time) then i' or j' could be a past of A 's world as far as he can tell (see def. *Doxastic history* for further formal restrictions on \sim_A). Doxastic alternatives are crucial in order to capture example (1b). At the time of Peter's smile, Peter's world might have had futures with or without Peter seeing the Fujiyama. But when the speaker utters (1) in the sense (1b), his doxastic alternatives are informed by later events and thus only cover indices where a later visit of the Fuji took place.

Metaphysic alternatives are notated as $i \approx j$. Two indices i, j with a common time t are metaphysical alternatives at t if their worlds share all facts at t but might develop differently at later times t' . Metaphysic alternatives code the openness of the future in the sense that even with perfect knowledge, some chance events such as flipping a coin have results that can't be predicted.

Syntax-semantic interface. According to Kaufmann, syntactic structures map on semantic representations by combining root clause content, tense and modals in the following steps: The root sentence S_{root} consists of untensed verb and all other constituents. S_{root} denotes a set of indices (sometimes also termed a "property of indices"). For example, the root sentence *Peter smile-* denotes all those indices i in which Peter smiles, and excludes all those where Peter does not smile. Root sentences are next composed with auxiliaries or modals, after which they combine with tense (PAST, PRESENT). The most important modal for our purposes is *woll-* that we see in its PAST form *would* and its PRESENT form *will*. The lexical entry of *woll* is as follows (square brackets $[[\alpha]]$ give the semantic denotation of word α).

$$(6) \quad [[\textit{woll}]] = \lambda O \lambda \phi \lambda T \lambda R \lambda s. \square_{O(s)} (\lambda j. sRj) (\lambda j. \phi(\lambda k. T(j)(k))(s))$$

The initial λ -terms code the expected semantic parts that *woll* can combine with. These are a modal ordering source O , the root sentence content ϕ , a tense operator T , and a modal accessibility R (doxastic or metaphysic). The ordering source serves to restrict attention to possible worlds that are relevant (suppressing highly unlikely worlds that the speaker ignores). The accessibility relation R codes whether a sentence conveys an objective statement about (metaphysically) possible futures of i or the speaker's subjective (doxastic) beliefs about the future of i . The resulting propositional content is once again true/false at indices s (coded by the last argument λs). Wherever possible, I will use the somewhat more common notation \forall for modal quantification \square to facilitate reading. In the facilitated notation and glossing various parts in prose, the meaning of *woll* spells like this:

- (7) $[[\textit{woll}]] = \lambda O \lambda \phi \lambda T \lambda R \lambda s. \forall j (j \text{ is among the modal alternatives of } s \text{ that are O-relevant} \wedge j \text{ is modally } R\text{-accessible to } s \rightarrow \text{the root sentence } \phi \text{ plus TENSE holds true in } j).$

‘In all modal alternatives j of the utterance index s of interest, $S_{\text{root}} + \text{TENSE}$ holds true in j .’

Here is an example sentence to give a feeling for the spirit of the analysis. The sentence *Peter will arrive* receives the following analysis:

- (8) $\lambda s. \forall j (\text{O}(s)\text{-relevant}(j) \wedge s \approx j \rightarrow \exists k [j \leq k \wedge \text{REF}(\langle sp \rangle, k) \wedge \text{PETER-ARRIVE}(k)])$
 ‘All (relevant) indices j that are exactly like s (the utterance index) up to now have some later time slot where “Peter arrive-” is true.’

We thus state that “Peter arrive-” will be true in all future worlds that our present world could develop into. The analysis makes use of Kaufmann’s semantic entries for the PRESENT and PAST which are added for the sake of completeness:

- (9) a. $[[\text{PRESENT}]] = \lambda i \lambda j. i \leq j \wedge \text{REF}(\langle sp \rangle, j)$
 b. $[[\text{PAST}]] = \lambda i \lambda j. j < i \wedge \text{REF}(\langle sp \rangle, j)$

The PRESENT relates utterance index i to indices j that are co-temporal with i or follow i . The speaker moreover is mentally focussed on j , index j is the speaker’s reference time REF. The PAST links the utterance index i to all indices j that precede i and that are the speaker’s reference time REF. We use reference times in order to capture the observation that the future-in-the-past reports things that happen in the future of the speaker’s past reference time.

In summary, Kaufmann’s analysis assumes that *woll* is the compositional core of the sentence and moderates the semantic composition with all other parts. This leads to a highly explicit analysis, as can be checked for sample derivations in the appendix.

4 Future-in-the-past: A first amendment

The present section discusses Kaufmann’s account for the future-in-the-past in the objective sense. I argue that the predictions about accessible modal alternatives are correct but the management of reference time is inadequate. Let us derive the denotation of example (3) repeated below. The sentence radical has the following meaning:

- (10) a. Peter would see the Fujiyama (soon).
 b. $[[\textit{Peter see- the Fuji}]] = \lambda X \lambda s. \exists m [X(m) \wedge \text{PETER-SEE-FUJI}(m)]$

Following Kaufmann, example (10a) yields the semantic value (11) by combining root sentence with *woll*, a contextually given ordering source O and the PAST tense.⁴

- (11) $\lambda s. \forall j (\text{O}(s)\text{-relevant}(j) \wedge s \approx j \rightarrow \exists m [(m < j \wedge \text{REF}(\langle sp \rangle, m)) \wedge \text{PETER-SEE-FUJI}(m)])$
 ‘At speech time s ...
 ... all indices that share the time of s and are metaphysic alternatives of s (and are most plausible in view of O) are such that ...
 ... there is some time m before the time of s which is in the focus of interest of the speaker and where the sun rises in m .’

⁴ A step-by-step derivation is given in the appendix.

If we interpret (10a) to state an objective truth, we can assume that (11) rests on the metaphysic accessibility relation \approx that covers all “real” possible futures of s .

The analysis correctly predicts that (10a) in its objective sense is informed by what the speaker knows *now*. The domain of modal quantification are worlds that are accessible alternatives at utterance time (*now*). They are thus determined at a time when the actual past events, including Peter seeing the Fuji, are known facts for the speaker. Example (12) makes this even more prominent.

(12) Peter flipped the coin. The coin would come up heads (but he did not know this yet).

The example receives the following representation.

(13) $\lambda s. \forall j (\mathbf{O}(s)\text{-relevant}(j) \wedge s \approx j \rightarrow$
 $\exists m [(m < j \wedge \text{REF}(<sp>, m)) \wedge \text{COIN-UP-HEADS}(m)])$
 ‘At the speech time s ...
 ... all indices that share the time of s and are O-relevant alternatives of s are such that ...
 ... there is some time m before the time of s which is in the focus of interest of the speaker and where the coin comes up heads at m .’

The analysis allows that at the time of Peter flipping the coin, both results (heads/tails) are possible futures. Hence if someone said: *The coin will come up heads* at the time of Peter flipping, he’d make an incorrect claim (he may by chance make a correct “guess”, but this is a different story).⁵ At the utterance index of (12) worlds where the coin comes up tails are no longer possible historical alternatives. The analysis thus successfully limits worlds to those that are possible “at utterance time s ”, as illustrated in Figure 1.

Yet, the denotation in (13) fails to reflect that the result *heads* was “after” the current reference time, i.e., the flipping of the coin. The predicted meaning of (12) is identical to the simple past sentence: *The coin came up heads*. It does not account for the intuition that the speaker of (10a), resp. (12) considers a reference time REF in the past but “before” the reported event (seeing the Fuji, and the coin coming up heads respectively). This becomes visible when we consider subsequent discourse. The last clause in (12), for instance, should be interpreted as ‘Peter did not know this at R when he flipped the coin’. It can’t mean ‘Peter did not know this after the coin had come up head’.

The future-in-the-past reports that an event happens later than the salient reference time in the past, as examples consistently confirm. Consider (14).

(14) Peter left the camp. He would soon see the Fujiyama. A bird passed by.

The text conveys that the passing of the bird happens just after Peter left the camp. (14) can’t mean that the bird passed *after* Peter saw the Fujiyama. Reference time serves to track the order of reported events in narration (Hinrichs 1986; Kamp & Reyle 1993; Klein 1994; Asher & Lascarides 2005). It is generally assumed that simple past clauses in narration report events that happen directly after the currently salient reference time. Following this rationale, the reference time for the last sentence: *A bird passed by* must be before Peter sees Fuji, not afterwards. Kaufmann’s analysis predicts that (14) should be true in a sequence of events *leaving – seeing Fuji – bird passing*. This is inadequate.

Kaufmann (2005: fn. 15) acknowledges this shortcoming and proposes to account for the forward shift in terms of an extension of the reference time interval into the future. It

⁵ Leaving aside prophets, gods, clairvoyants or the possibility that the future is deterministic.

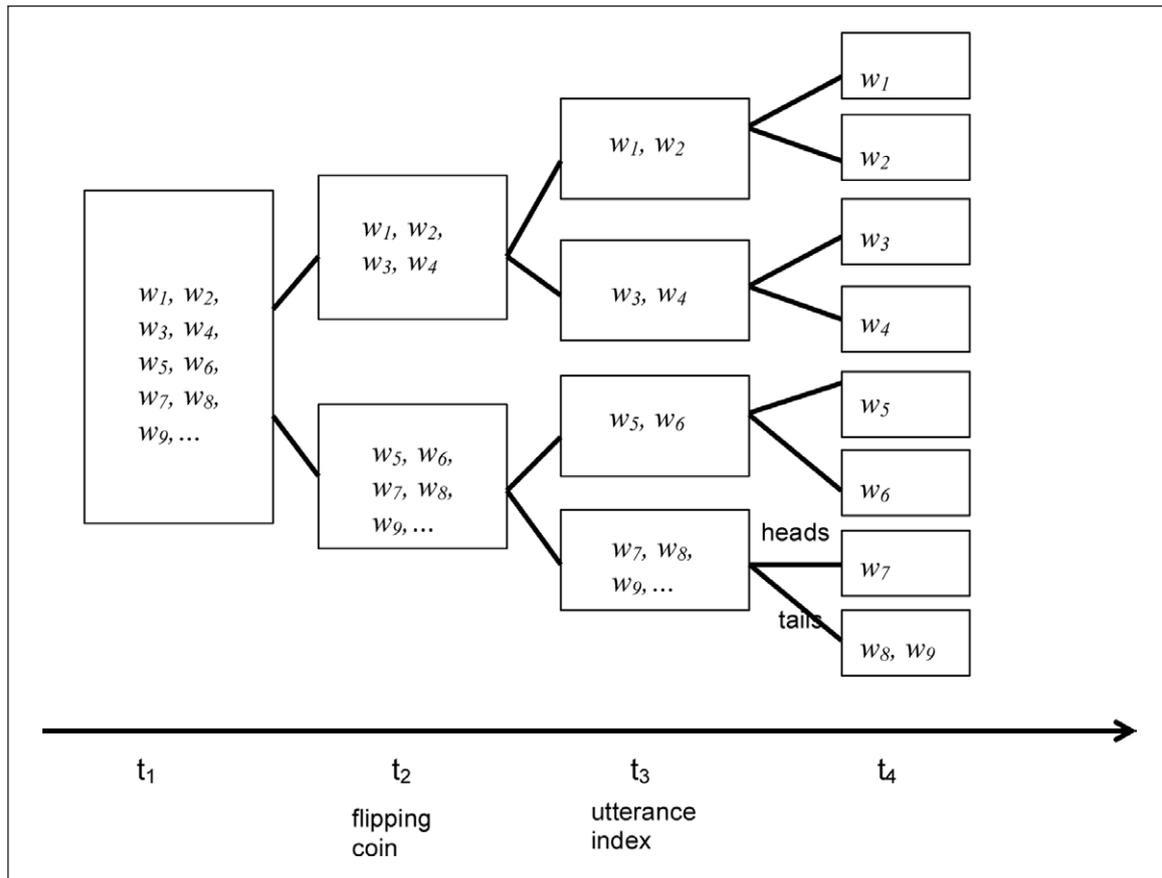


Figure 1: Possible futures.

is however unclear how an extended reference time plays out in the analysis of sequence of events in narration. In examples like (14) we would have to assume that not only the reference interval is extended but also that the *starting point* of the interval is relevant for *sequence-of-event* purposes whereas the *end point* is relevant for the purpose of *locating the reported event*. Spelling out the idea while staying consistent with earlier accounts is a non-trivial task.

Instead, I propose to integrate a futurate shift as part of the meaning of *woll*. This coheres nicely with Kaufmann’s view that *woll* is a temporal/modal hybrid (2005: 253). (15) offers a semantic entry for *woll* that includes the futurate shift (in the Kaufmann notation). New parts are given in boldface.

$$(15) \quad [[\text{woll}_1]] = \lambda O \lambda \phi \lambda T \lambda R \lambda s. \square_{O(s)} (\lambda j. sRj) \\ (\lambda j. [\lambda X' \exists m [X'(m) \wedge (\phi(\lambda n. m < n)(s)] (\lambda k. T(j)(k))]))$$

The appendix demonstrates in detail how and why the boldface operator effects a futurate shift. Let me demonstrate the effects of (15) with an example. If we compute sentence (12) *The coin would come up heads* with the new *woll*, it receives the denotation in (16). The forward shift is in boldface.

$$(16) \quad \lambda s. \forall j (O(s)\text{-relevant}(j) \wedge s \approx j \rightarrow \\ \exists m (m < j \wedge \text{REF}(\langle sp \rangle, m) \wedge \exists k [m < k \wedge \text{COIN-UP-HEADS}(k)])))$$

‘At the index of utterance *s*, we find that in all O-relevant alternatives *j* of *s*, there is an earlier time *m* – and the speaker is interested in *m* – such that at some time *k* later than *m* the coin comes up heads.’

The reference time m is thus before the time k when the coin comes up heads. We can still refer to m , for instance when we interpret the last clause in (13) and understand that the bird passed by at m .

Let us see how $woll_1$ plays out in PRESENT tense examples. (17) is the present tense counterpart of (12).

(17) The coin will come up heads.

This sentence receives the denotation in (18) under the new analysis of $woll_1$. The non-past interpretation of PRESENT of Kaufmann was maintained.

(18) $\lambda s. \forall j (\mathbf{O}(s)\text{-relevant}(j) \wedge s \approx j \rightarrow \exists m (j \leq m \wedge \text{REF}(\langle sp \rangle, m) \wedge \exists k [m < k \wedge \text{COIN-UP-HEADS}(k)]))$

(18) states that the coin comes up heads after utterance time s in all possible futures of s . This is adequate. Like Kaufmann we predict that (18) is false under most normal utterance situations s : At the time of utterance s , there are later indices where the coin comes up heads *and* later indices where the coin comes up tails.⁶

The present section argued in favour of a futurate shift as part of the meaning of *woll*. We implemented this idea in $woll_1$ and demonstrated that $woll_1$ leads to adequate predictions for the PRESENT *will*-future and the PAST *would*-future. The next section discusses the doxastic differences between objective and shifted uses of the future-in-the-past.

5 The scope of tense and the doxastic timeline

The present section takes a closer look at the doxastic timeline: who knows what when? The non-shifted and shifted use of the future-in-the-past differ significantly in this respect. The non-shifted reading rests on “what the narrator knows/believes at utterance time”. The shifted reading rests on “what the protagonist knew/believed at the past reference time”. While $woll_1$ can account for the non-shifted use, I show that it makes wrong predictions about the doxastic timeline of shifted uses. We thus need a further extension of the account.

Let us reconsider the similarities and differences between objective and shifted reading of the future-in-the-past on basis of a modified version of example (12).

(19) Peter flipped the coin (confidently). It would come up heads!

The text allows two readings. In the objective reading, the second sentence offers an outlook on the result of flipping. In the shifted reading, Peter has the optimistic thought: *The coin will come up heads*. While the objective reading entails that the result was heads, the subjective reading reports Peter’s belief about the future which may turn out to be false.

Our analysis of *woll* offers a starting point to model the different doxastic perspectives. According to Kaufmann, the final ingredient in semantic composition is the modal base R . It can be instantiated by the doxastic history relation \sim_A of agent A . A narrator-based reading arises if we take the narrator as the doxastic center of \sim . The shifted reading involves a salient protagonist as the doxastic center of \sim , in our case Peter.

Yet the shift alone is not sufficient to account for the shifted reading. Here is why. Let us assume that we can freely choose \sim_{narrator} or \sim_{Peter} as the doxastic history relation. Sentence (19) thus receives the two semantic representations in (20) and (21).

(20) $\lambda s. \forall j (\mathbf{O}(s)\text{-relevant}(j) \& s \sim_{\text{narrator}} j \rightarrow \exists m ([j \leq m \wedge \text{REF}(s, m)] \wedge \exists k [m < k \wedge \text{COIN-UP-HEADS}(k)]))$

⁶ Unless we believe in the world being predetermined.

$$(21) \quad \lambda s. \forall j(\mathbf{O}(s)\text{-relevant}(j) \ \& \ s \sim_{\text{Peter}} j \rightarrow \exists m ([j \leq m \wedge \text{REF}(s, m)] \wedge \exists k [m < k \wedge \text{COIN-UP-HEADS}(k)]))$$

(20) correctly renders the objective reading. It predicts that according to what the speaker knows at his utterance time, the coin came up heads after the narrator's current time of interest. Assuming that the narrator knows what happened to the coin and granting that the utterance time is long enough after the flipping, we predict that the coin in fact came up heads.⁷

The proposition derived in (21) is problematic. It can be paraphrased as 'according to what *Peter* knows *now*, as *I am telling you this*, the coin came up heads some time later than the time that *I take an interest in* right now'. This paraphrase is nearly incomprehensible and does not capture the shifted reading of (19). Firstly there is a strange mix of assumed beliefs. Should Peter know that the speaker takes an interest in time R? How does the speaker know what Peter knows today? Peter could be dead by the end of the story, so Peter's beliefs may not even be defined.⁸ Secondly (21) predicts that Peter's thoughts rest on what he learned *later*, just as the speaker's future-in-the-past offers an outlook on what the speaker learned *later*. This is inadequate. Thoughts in free indirect discourse such as in (19) reflect the protagonist's belief at the reference time of (19). In our example, Peter is entitled to think: *The coin will come up heads!* even if he learns later that the result was tails. The analysis in (21) fails to predict this.

The problem arises in the combination of *woll* and tense. The semantic entries for *woll* and *woll₁* ensure that the utterance index is by necessity the point of departure for modal quantification. Tenses – PAST or PRESENT – modify the content of the sentence radical ϕ but do not have access to temporal parameters in the restrictor of the modal quantifier $\square_{\mathbf{O}(s)}$ ('for all j that are O-relevant'). This is inadequate for the shifted reading of the future-in-the-past. The PAST tense should contribute that the act of thinking and the content of thought are anchored at reference time. This means that the combination of *woll*, S_{root} and tense must proceed in a different order in free indirect discourse. The following second version *woll₂* meets these demands (again, in the official notation).

$$(22) \quad [[\text{woll}_2]] = \lambda O \lambda \phi \lambda R \lambda X \exists s. [X(s) \wedge \square_{\mathbf{O}(s)} (\lambda j. sRj) (\lambda j. (\phi(\lambda n. j < n)(s)))]$$

In order to get this modal to work, we moreover assume that tense enters semantic composition at a different point: tense can scope above *woll₂*. Tense thus combines with the result of composing *woll₂* with its arguments *woll₂(O)([[S_{root}]])(\sim_A)*. Tense adds further information about index s , the time of making a claim about the future. (23) shows the composition of: *The coin would come up heads*, based on *woll₂* and in the assumed scopal order.⁹

$$(23) \quad \text{a.} \quad [[\text{woll}_2]] = \lambda O \lambda \phi \lambda R \lambda X \exists s. [X(s) \wedge \square_{\mathbf{O}(s)} (\lambda j. sRj) (\lambda j. (\phi(\lambda n. j < n)(j)))]$$

⁷ Predicting veridicality of the objective future-in-the-past requires further assumptions about the timeline of the narrative. The time of utterance has to be sufficiently distal from reference time to allow for the reported event to happen. This is most likely ensured by competition between the future-in-the-past and the (less costly?) simple *will*-future. The speaker has some reason to chose the more complex future-in-the-past and the hearer can assume that veridicality could be this reason. The pragmatics of the future-in-the-past in competition with the *will*-future remains unexplored here. I thank Manfred Krifka (p.c.) for pointing out the competition between *will* and future-in-the-past.

⁸ I am staying away from further questions about a fictitious Peter and what the speaker could know about his present beliefs.

⁹ The complete derivation with all intermediate steps is given in the appendix.

- b. $[[\textit{the coin come- up heads }]]$
 $= \lambda X \lambda s. \exists m' [X(m') \wedge \text{COIN-UP-HEADS}(m')]$
- c. $[[\textit{woll}_2 (\mathbf{O}) ([[\textit{the coin come- up heads }]])]]$
 $= \lambda R \lambda X. \exists s [X(s) \wedge \Box_{\mathbf{O}(s)} (\lambda j. sRj)$
 $(\lambda j. (\exists m' [(j < m') \wedge \text{COIN-UP-HEADS}(m')]))]$

The modal base R in our present example are Peter's doxastic alternatives \sim_{Peter} . Finally we compose (22) with the PAST.

$$(24) \quad \lambda i. \exists s. [s < i \wedge \text{REF}(\langle sp \rangle, s) \wedge \forall j (\mathbf{O}(s)\text{-relevant}(j) \wedge s \sim_{\text{Peter}} j \rightarrow \exists m' [(j < m') \wedge \text{COIN-UP-HEADS}(m')])]$$

'At the utterance time i , there is an earlier index s in the focus of the speaker's attention. All Peter's doxastic alternatives at this index s have a later index m' at which the coin comes up heads (as the result of the present flipping).'

We can now take advantage of Kaufmann's ontology. According to his modelling, all doxastic alternatives j of s share the time of s . (24) quantifies over all the worlds that Peter maintains as doxastic alternatives at reference time. They reflect Peter's beliefs at reference time. At this past time, Peter believed to be in a world in which the coin would come up heads. This does not entail that the coin actually came up heads. In particular, Peter's beliefs at s need not be the same as what he – or the speaker – believes at utterance time. The interaction between the modal \textit{woll}_2 and PAST tense ensures the correct doxastic timeline of Peter's thought.

The essential insight of the present section is that the scopal order of operators of future-in-the-past in the shifted sense must differ from the order of operators in the objective sense. In the objective sense, PAST tense takes scope below \textit{woll} . In the shifted (FID) sense, PAST must scope above \textit{woll} . Kaufmann assumes that \textit{woll} dictates the scopal order of operators. If we maintain his setup, different scope orders require a second version of \textit{woll} and the proposed ambiguity between \textit{woll}_1 and \textit{woll}_2 allows us to capture the different doxastic timelines of objective and shifted readings.

If we are willing to steer further away from Kaufmann, we could implement more scopal flexibility in general and thus avoid ambiguity. The final section explores how much further away this would lead us from current standard analyses of tense and aspect and the answer is: quite far. It is for this reason that the core paper takes the more conservative route.

The next section addresses the final question: who is the speaker? The logic of speaker shift in free indirect discourse is beyond the aims of Kaufmann (2005) and his treatment of indexicals remains underspecified in this respect. Shifted interpretations in free indirect discourse require that many context-dependent items, amongst which epistemic and doxastic operators, shift in unison (Eckardt 2012, 2015a). Thus, the doxastic modal base of \textit{woll} should become part of a general system of shifting indexicals.

6 Perspective in free indirect discourse

6.1 Shifting indexicals

Sentences in free indirect discourse report thoughts or utterances of a protagonist rather than an utterance by the narrating instance. While literary science is interested in content-based triggers of perspective shift, linguistic research investigates the semantic basis of free indirect discourse (Doron 1991; Schlenker 2004; Sharvit 2008; Eckardt 2012, 2015a; Maier 2015). Shifting indexicals are a class of context referring items that can be oriented

to the narrating instance (the “real” speaker) or to a salient protagonist in the story. Shifting indexicals includes a wide variety of expressions such as temporal adverbials (*tomorrow*, *soon*, *last week*), exclamatives, emotive expressions, certain particles, evaluatives, questions and doxastic/epistemic modals. The latter are of particular interest for us because *woll* can be viewed as another case of doxastic/epistemic perspective taking. The following examples illustrate the shift of the adverb *perhaps* in free indirect discourse. A uniform analysis of speaker orientation in adverbs like *perhaps* and the modal elements of future-in-the-past would be desirable.

- (25) (...) Peter slowly opened the letter. Perhaps he was the lucky winner.
 Shifted reading (FID): ‘Peter holds it possible that he is the winner.’
 Non-shifted reading: ‘The narrator reports the possibility that Peter is the winner.’ (less plausible).
- (26) (...) Peter slowly opened the letter. Perhaps he was afraid of its contents.
 Shifted reading (FID): ‘Peter holds it possible that he is afraid.’ (less plausible).
 Non-shifted reading: ‘The narrator holds it possible that Peter is afraid.’

Sentences of the form *perhaps S* express that ‘*S* holds true in some doxastic alternatives of x_{sp} ’. In the non-shifted readings, the speaker parameter x_{sp} is instantiated by the narrator. In the shifted readings, x_{sp} is instantiated by the protagonist Peter, as if the sentence was uttered in a context d with speaker Peter and time, place and world of the ongoing story. I use the treatment of shifting indexicals developed in Eckardt (2012, 2015a, 2015b). Shiftable and rigid indexicals as viewed as free parameters. Each sentence S can be interpreted as dependent on a single context C or on a pair $\langle C, d \rangle$ with a secondary context d . These interpretations are notated as $[[S]]^C$ and $[[S]]^{\langle C, d \rangle}$. The rigid speaker parameter x_{sp} is always instantiated by C . The shiftable speaker parameter x_{sp} is instantiated by C in the $[[S]]^C$ interpretation and by d in the $[[S]]^{\langle C, d \rangle}$ interpretation. In our present example, the adverb *perhaps* must be analysed as ‘ x_{sp} holds it possible that ...’. Hence (25) and (26) can be interpreted as non-shifted and refer to C where the narrator is the speaker. $[[(25)]]^C$ states that the narrator holds it possible that Peter is the winner. Both examples can likewise be interpreted in the shifted sense $[[S]]^{\langle C, d \rangle}$ and refer to d , the context of Peter speaking or thinking. $[[(25)]]^{\langle C, d \rangle}$ reports that *Peter* holds it possible that he is the winner. (We will continue to talk about *Peter’s perspective* when referring to FID readings.) Such we derive shifted and non-shifted interpretations of speaker-oriented sentences. The present section extends this treatment to the future-in-the-past.

Our account embraces a hybrid treatment of indexicality. Following Kaufmann, variables over world-time pairs (“index”) are arguments of operators, they get bound by quantifiers and modified. Only the last $\langle \text{world, time} \rangle$ parameter is instantiated by the utterance context and hence “indexical” in Kaplan’s sense (Kaplan 1989). The speaker and addressee parameters are indexicals. They do not get bound by quantifiers (for a seeming counterexample see Eckardt 2015b). Following Kaplan (1989) they are managed outside the semantic composition of the core sentence. We have to make sure that two parallel systems interact consistently.

The *woll*-future includes speaker orientation at various points. The doxastic modal base R mirrors the speaker’s beliefs. The ordering source O mirrors what the speaker holds most likely. Finally, the reference time REF mirrors the temporal focus of attention of the speaker, and hence PAST/PRESENT are speaker oriented. Not all of them shift orientation. The doxastic modal base and ordering source both get re-oriented from the narrator to *Peter* in shifted interpretations and thus behave like the modal *perhaps* in examples

(25)/(26). The orientation of tenses is rigid: the reference time is oriented to the narrator in all possible interpretations.

Let us add another shiftable item, the adverbial *tomorrow*, in order to see how these shifts are systematized in the present analysis. (27) lists semantic units that do not change orientation in free indirect speech when they are interpreted relative to $\langle C, d \rangle$.

- (27) a. $[[\text{PRESENT}]] = \lambda i \lambda j. i \leq j \wedge \text{REF}(x_{sp}, i, j)$
 b. $[[\text{PAST}]] = \lambda i \lambda j. j < i \wedge \text{REF}(x_{sp}, i, j)$
 with $\text{REF}(x, i, j) = \text{true}$ if and only if person x in situation i focusses on reference index j .
 ‘ x_{sp} , talking in i , takes an interest in reference time j .’ (x_{sp} = the narrator)

Next, let us determine the shifting parts of meaning. We assume that modal base and ordering source depend on an indexical parameter x_{sp} . x_{sp} is instantiated by the narrator or *Peter*, depending on the mode of interpretation. More formally:

- an indexical modal accessibility relation $\sim_{x_{sp}}$ relates an individual x_{sp} to a (doxastic) modal accessibility relation on $I \times I$
 ‘We consider all those worlds that x_{sp} believes to be possible futures. x_{sp} ’s beliefs rest on what x_{sp} knows at i . x_{sp} could be the narrator or *Peter*.’
- an indexical ordering source $O(x_{sp}, s)$ relates x_{sp} and index s to a ordering source on $I \times I^{10}$
 ‘We restrict attention to those worlds that x_{sp} holds most plausible at i . x_{sp} could be the narrator or *Peter*.’

In survey, our toolbox offers the following components:

1. $woll_1$ which combines tense with the sentence radical in the scope of modal quantification.
2. $woll_2$ to compose tense with scope above the modal quantification, to derive readings that report on *earlier* doxastic states of the speaker.
3. Shifting and non-shifting ways to refer to the speaker and/or to a protagonist: $x_{SPEAKER}, x_{speaker}$. These are put to use in:
 - a. shiftable speaker-oriented items: the doxastic modal relation and ordering source.
 - b. non-shifting speaker-oriented reference time REF.
4. Interpretation of sentences relative to single contexts $[[\cdot]]^c$ or complex contexts $[[\cdot]]^{\langle C, d \rangle}$.

All components can be combined freely.

6.2 Examples of perspectivizing future-in-the-past

Let us analyse examples of perspectivizing future-in-the-past. Here are three examples that allow for shifted (FID) readings.

- (28) Peter smiled. Tomorrow he would see the Fujiyama.
 (29) Peter is smiling. Tomorrow he will see the Fujiyama.
 (30) I smiled. Tomorrow I would see the Fujiyama.

¹⁰ The ordering source $O(x_{sp}, s)$ mostly figures in the distinction of *will*-future, *going-to*-future and presentic future in Kaufmann. The component is mostly inert in the present data but was retained to ensure consistency with the overall account.

The shifted sense of these examples is derived on basis of $woll_2$ and doxastic perspective of x_{sp} .¹¹ Example (28) yields the following denotation.

$$(31) \quad a. \quad \lambda i. \exists s. [s < i \wedge \text{REF}(x_{sp}, i, s) \wedge \forall j (\mathbf{O}(x_{sp}, s)\text{-relevant}(j) \wedge s \sim_{x_{sp}} j \rightarrow \exists m' [j < m' \wedge \text{SEE}(\text{Peter}, \text{Fuji}, m')])]]$$

‘At some time before utterance time, there was a time s that is at the focus of attention of the speaker x_{sp} . As far as the speaker x_{sp} believes at s , Peter sees the Fujiyama somewhat later.’

We left the mode of interpretation unspecified so far. For a shifted sense we consider $[[(28)]]$ ^{<C, d>} with the narrator = speaker in C and Peter = speaker in d . The result is paraphrased in (31b).

$$(31) \quad b. \quad [[(\text{tomorrow}) \text{ he would see the Fujiyama }]]$$
^{<C, d>}

‘At the time R that the narrator is talking about, Peter believed that in all possible futures-of-Peter in R , there will be a time where Peter sees the Fuji’.

The sentence thus reports Peters past belief about Peter’s future. This is the correct content for the shifted sense of the future-in-the-past. The interpretation is highlighted when we add the adverb *tomorrow*. The denotation of (28), including *tomorrow*, is shown in (31c).

$$(31) \quad c. \quad \lambda i. \exists s. [s < i \wedge \text{REF}(x_{sp}, i, s) \wedge \forall j (\mathbf{O}(x_{sp}, s)\text{-relevant}(j) \wedge s \sim_{x_{sp}} j \rightarrow \exists m' [j < m' \wedge \text{TOMORROW}(m', j) \wedge \text{SEE}(\text{Peter}, \text{Fuji}, m')])]]$$

Evaluation of (31c) in a shifted context $\langle C, d \rangle$ can be paraphrased as follows:

$$(31) \quad d. \quad [[\text{tomorrow, he would see the Fujiyama }]]$$
^{<C, d>}

‘At the narrator’s reference time R in the past, *Peter* believes that he will see the Fujiyama and that this happens at a time that is *Peter’s* “tomorrow” when *Peter* has this belief.’

The temporal adverbial is correctly related to the time of Peter thinking and not to the time of the narrator talking.

Example (29) is the present tense counterpart of (28). The result of the respective computation is shown in (32) with the PRESENT contribution in boldface.

$$(32) \quad [[\text{PRESENT}]] \oplus [[\text{woll}_2(\mathbf{O}(x_{sp}))(\text{he see the Fuji tomorrow})(\sim_{x_{sp}})]]$$

$$= \lambda i. \exists s. [i \leq s \wedge \mathbf{REF}(x_{sp}, i, s) \wedge \forall j (\mathbf{O}(x_{sp}, s)\text{-relevant}(j) \wedge s \sim_{x_{sp}} j \rightarrow \exists m' [j < m' \wedge \text{TOMORROW}(m', j) \wedge \text{SEE}(\text{Peter}, \text{Fuji}, m')])]]$$

‘The focus of interest of speaker x_{sp} is index s (now or later). As far as speaker x_{sp} believes at index s , all possible futures that are most plausible lead to a later index when Peter sees the Fuji. This later index is one day after the speaker’s time of interest.’

If the speaker is understood to be Peter, the sentence reports a belief of Peter about his doxastic alternatives and their future. If the speaker is understood to be the narrator, the sentence reports what the narrator believes about the future.¹²

¹¹ Again, the full derivations of (28) – (30) can be found in the appendix.

¹² The computation rests on Kaufmann’s PRESENT as non-past which explains that the reference time could be after the speaker’s utterance time.

Example (30) is a first person version of (28). It illustrates the difference between what the narrator knows *now* and what the narrator knew *earlier*. The denotation is given in (33a).

$$(33) \quad \text{a. } [[\text{PAST}]] \oplus [[\text{woll}_2(\mathbf{O}(x_{sp}))(\text{I see the Fuji tomorrow})(\sim_{x_{sp}})]] = \\ \lambda i. \exists s. [s < i \wedge \text{REF}(x_{sp}, i, s) \wedge \forall j (\text{O}(x_{sp}, s)\text{-relevant}(j) \wedge s \sim_{x_{sp}} j \\ \rightarrow \exists m' [j < m' \wedge \text{TOMORROW}(m', j) \wedge \text{SEE}(x_{sp}, \text{Fuji}, m')])]]$$

The example highlights how woll_2 inevitably takes the (past) reference time as the time at which possible alternative worlds are accessed. (33a) states that the speaker believed *earlier* that she would see the Fujiyama. It makes this statement in both the non-shifted $[[\cdot]]^c$ or the shifted $[[\cdot]]^{<C, d>}$ interpretation. The most plausible d maintains the referent of I as speaker in d .¹³

$$(33) \quad \text{b. } [[\text{I would see the Fujiyama}]]^{<C, d>}$$

‘I am interested in some earlier index R . At that index, I (= speaker in d) believed that I (= speaker in C) would see the Fuji the next day.’

$$(33) \quad \text{c. } [[\text{I would see the Fujiyama}]]^c$$

‘I am interested in some earlier index R . At that index, I (= speaker in C) believed that I (= speaker in C) would see the Fuji the next day.’

The interpretations in (33b and 33c) yield an interpretation that has long been acknowledged in literary science. First person narrators can shift back and report past events from the viewpoint of their younger *ego*.

What is still missing in (30) is the objective reading of the future-in-the-past: the speaker is certain *today* that the visit of the Fujiyama took place. The semantic ingredients in (33a) can’t express this. In order to force the necessary scopal order, we have to employ woll_1 .

6.3 Examples of objective future-in-the-past

In order to derive the objective sense of (30) and other examples, we have to resort to woll_1 and the corresponding scopal order. The following examples illustrate the objective reading.

(34) Peter smiled. (Later, as he didn’t know then,) He would see the Fujiyama.

(35) Peter is smiling. (I know that next year,) He will see the Fujiyama.

The present account bases the objective reading on woll_1 . (34a) shows the denotation for (34) on basis of woll_1 and the metaphysic modal base \approx .

$$(34) \quad \text{a. } \lambda s. \forall j (\text{O}(s)\text{-relevant}(j) \wedge s \approx j \rightarrow \exists m [m < j \wedge \text{REF}(x_{sp}, j, m) \wedge \\ \exists m' (m < m' \wedge \text{SEE}(\text{Peter}, \text{Fuji}, m'))])]$$

If we interpret this in a single context C the result can be paraphrased as follows:

$$(34) \quad \text{b. } [[\text{woll}_1(\mathbf{O})([[\text{he see- the Fuji}]]) (\text{PAST}) (\approx)]]^c$$

‘At the utterance index, the most plausible accessible metaphysic alternatives contain an earlier time point j that is at the focus of the speaker’s attention and, from which on in the future, Peter sees the Fuji’.

¹³ A secondary context d with a speaker \neq myself is possible. Adventurous readers can try to write suitable stories around the sentence that support this reading. The text strongly disfavours this interpretation which is why I leave it aside.

The denotation leaves it open whether the utterance index is later than m' when Peter sees the Fuji but in a richer context the sentence can imply that the visit of Fuji is in the past of the utterance and hence a known fact (see also fn. 7). (33a) rests on the metaphysic accessibility relation \approx and thus reports objective future possibilities of the world at s .

If we replace the metaphysical modal base \approx in (34) by a doxastic base $\sim_{x_{sp}}$ we derive a statement about the speaker's doxastic alternatives.

$$(34) \quad c. \quad [[woll_1(\mathbf{O})([[he\ see- the\ Fuji]])(PAST)(\sim_{x_{sp}})]]^c$$

'At the utterance index C , the most plausible accessible doxastic alternatives for the speaker-in- C contain an earlier time point j that is at the focus of the speaker's attention and, from which on in the future, Peter sees the Fuji.'

The doxastic alternatives are determined *now*, at the utterance time, and hence do not contain any branches that the speaker *now* knows did not happen. If the speaker *now* knows that Peter saw the Fuji, then the speaker does no longer consider alternatives where Peter did not. We correctly predict the doxastic timeline of the objective sense of (34). Assuming sufficient temporal distance between utterance time and reference time (see fn. 8), the resulting reading implies that the visit of the Fuji has taken place.

The present tense counterpart (35) is analysed in (35a). The result is practically identical to Kaufmann's analysis of the *will*-future.

$$(35) \quad a. \quad \lambda s. \forall j (\mathbf{O}(s)\text{-relevant}(j) \wedge s \approx j \rightarrow \exists m [j \leq m \wedge \text{REF}(x_{sp}, j, m) \wedge \exists m' (m < m' \wedge \text{SEE}(\text{Peter}, \text{Fuji}, m'))]])$$

This reading states that all most likely accessible metaphysic alternatives to the utterance index contain a future time point where Peter sees the Fujiyama, which is an adequate prediction.

6.4 Additional predicted readings

So far we studied the use of $woll_1$ in non-perspectivized passages (and hence tied to $[[\cdot]]^c$) and the use of $woll_2$ in shifted interpretations $[[\cdot]]^{<C, d>}$. Both combinations led to observable readings. The present subsection investigates the effects of $woll_2$ in a simple context C and of $woll_1$ in a shifted context $<C, d>$. Anticipating the result of this exploration, the use of $woll_2$ in non-perspectivized passages can be observed in rare cases whereas $woll_1$ in contexts $[[\cdot]]^{<C, d>}$ overgenerates.

We take sentence (28) *He would see the Fujiyama* as our starting point. The denotations in (31a) and (34a) above account for the objective and the shifted sense of *He would see the Fujiyama*. But what happens if we evaluate (31a) in a non-shifted context C and (34a) in a shifted context $<C, d>$? The first option is explored in (31d). It takes the denotation in (31a) and evaluates it in a single context C with just one speaker.

$$(31) \quad d. \quad [[[tomorrow, he\ would\ see\ the\ Fujiyama]]]^c \\ = \lambda i. \exists s. [s < i \wedge \text{REF}(C(x_{sp}), i, s) \wedge \\ \forall j (\mathbf{O}(C(x_{sp}), s)\text{-relevant}(j) \wedge s \sim_{C(x_{sp})} j \rightarrow \\ \exists m' [j < m' \wedge \text{TOMORROW}(m', j) \wedge \text{SEE}(\text{Peter}, \text{Fuji}, m')]]]$$

Both x_{sp} and x_{sp} are instantiated by the speaker in C , the narrator. The narrator tells us the following: "I am *now* interested in some earlier time s at which, according to all I knew and believed *then*, all possible futures contained an event of Peter seeing the Fujiyama. This event happened at the day following s ."

The predicted reading could be explicated, roughly, as 'At that time I believed that Peter would see the Fuji the next day'. Even though there is no first person narrator,

this narrating instance is not a neutral omniscient speaker but a person with a history. Such narrative instances are well-known in literary science and are used in literary texts (Martinez & Scheffel 2009; Eckardt 2015c). The pose corresponds to the first person narrator and his/her younger self as discussed in (30). Hence there is good reason to assume that $woll_2$ can be evaluated against non-shifted and shifted contexts.

The dual constellation is $woll_1$ in a shifted context $\langle C, d \rangle$. We start from (34a) with a doxastic modal accessibility relation $\sim_{x.sp}$ and evaluate it in a context $\langle C, d \rangle$ where Peter is the speaker in d .

$$(34) \quad d. \quad \lambda s. \forall j(O(C(x_{sp}),s)\text{-relevant}(j) \wedge s \sim_{x.sp} j \rightarrow \\ \exists m[m < j \wedge \text{REF}(x_{sp}, j, m) \wedge \exists m'(m < m' \wedge \text{SEE}(\text{Peter}, \text{Fuji}, m'))])$$

‘At the index of utterance s , all Peter’s doxastic alternatives are such that they contain a past time m in which the narrator (\neq Peter) is interested and after which Peter sees the Fujiyama’.

In the shifted context $\langle C, d \rangle$, the sentence should be paraphrasable as above.

According to my intuitions, this proposition is not an available reading of *He would see the Fujiyama* in any context. We have to constate that $woll_1$ is not permitted in $\langle C, d \rangle$ based interpretation. This restriction has to be stipulated. The reasons underlying this gap remain to be investigated.

In summary, Section 6 introduced a uniform way to treat shifted readings of sentences in free indirect discourse and put the resulting final theory to use in the analysis of various examples. On basis of the right choice of $woll_{1/2}$ and interpretation in C or $\langle C, d \rangle$ all observed readings can be derived. What remains is the challenge of overgenerating. The analysis predicts possible interpretations that are not observable in actual language use. This challenge will be discussed (though not answered) in the final section.

7 Summary and discussion

The present paper investigates the past futurate in English and its interpretations in a non-shifted and shifted sense. It takes the Kaufmann (2005) analysis of the *will*-future as starting point and Section 3 recapitulated the ontological assumptions, lexical entries and syntax-semantics interface of the account. These were illustrated on basis of an example.

Section 4 argued that the basic account does not capture the forward shift in future-in-the-past sentences adequately. Kaufmann predicts that the reported event happens at the reference time (=the time index at the focus of the speaker’s attention) whereas in fact, the reported event happens later than the reference time. Section 4 proposed a modification of Kaufmann’s *woll* verb that includes a futurate component and can capture the forward shift.

Section 5 investigated the doxastic timeline of examples in more detail. Whereas the non-shifted reading of the future-in-the-past is informed by the speaker’s knowledge *at the time of utterance*, the shifted reading reflects the knowledge of a speaker *at a past reference time*. Kaufmann’s architecture of tenses, *woll* and the sentence radical can’t account for the timeline where the doxastic alternatives of s are determined for a past index s . (36) repeats the crucial minimal contrast.

(36) Peter was smiling. He would see the Fujiyama.

objective reading: ‘At some later time Peter sees the Fujiyama – as the speaker knows *now*.’

Shifted reading: ‘At some later time Peter sees the Fujiyama – as far as Peter could foresee *at the time of his smiling*.’

Keeping to the original analysis as closely as possible, Section 5 introduced a second version $woll_2$ that allows to compose tense with the modal rather than with the sentence radical. This second version correctly predicts the doxastic timeline of the shifted reading: doxastic alternatives are computed in the past. The two entries are repeated below.

$$(37) \quad [[woll_1]] = \lambda O \lambda \phi \lambda T \lambda R \lambda s. \square_{O(s)} (\lambda j. sRj) \\ (\lambda j. [\lambda X' \exists m [X'(m) \wedge (\phi(\lambda n. m < n)(s)] (\lambda k. T(j)(k))]])$$

$$(38) \quad [[woll_2]] = \lambda O \lambda \phi \lambda R \lambda X \exists s. [X(s) \wedge \\ \square_{O(s)} (\lambda j. sRj) (\lambda j. (\phi(\lambda n. j < n)(j)))]$$

The two $woll$ combine with tense in different manners. $woll_1$ takes PRESENT/PAST as an argument. $woll_2$ requires the following rule of type-adjusting semantic composition with operators of type $\langle \langle s, t \rangle, t \rangle$.¹⁴

$$(39) \quad \text{a. } \text{PRESENT} \oplus \theta := \lambda i. \theta (\text{PRESENT}(i)) \\ \text{b. } \text{PAST} \oplus \theta := \lambda i. \theta (\text{PAST}(i))$$

Section 6 spelled out how reference to different speakers leads to shifted readings (free indirect discourse) by making use of (a) two homonyms $woll_{1/2}$ and (b) evaluation of utterances in single contexts C or pairs of contexts $\langle C, d \rangle$. While $woll_1$ only occurs in single context evaluations (non-shifted readings), $woll_2$ leads to observable readings in both types of interpretation (shifted and non-shifted).

The proposed account leaves several questions for future research. The analysis correctly accounts for the data, yet it has to assume that the lexicon of English contains special entries for free indirect speech. This assumption contradicts the widely shared belief that free indirect discourse arises by interpreting ordinary language in a new way (Doron 1991; Schlenker 2004; Sharvit 2008; Eckardt 2015a; Maier 2015). The homonyms $woll_{1/2}$ do not differ in lexical content but serve to force different scope relations. Shifted and objective interpretations of the future-in-the-past differ in the scopal relations of PAST, modal and root sentence. This finding deepens our understanding of how semantic and pragmatic factors interact in the future-in-the-past, but the implementation is most likely not the final version.

A more radically different line of exploration could start by revising the management of indices that Kaufmann (2005) shares with other semantic accounts of tense and aspect (Abusch 1998; Condoravdi 2003; Copley 2008, 2014; von Stechow 2009; Giannakidou & Mari 2013; Del Prete 2014). It is commonly assumed that indices are part of the functional composition of operators. Only the last open index is “indexical” in a pragmatic sense and instantiated by context. This traditional view is challenged by data in free indirect discourse. A survey of indicators of free indirect discourse reveals that temporal adverbials (e.g. *tomorrow*) systematically refer to the shiftable *now* rather than the utterance time of the narrating instance (Doron 1991; Zimmermann 1991, 2012; Eckardt 2015a: Chapter 4) and are hence sensitive to context. In other words, *tomorrow* refers to the *now-of- x_{sp}* rather than the objective utterance time of x_{sp} . Pushing this idea further, we might speculate whether the starting point of determining doxastic alternatives in $woll$ should likewise be the *now* of the shiftable speaker x_{sp} rather than the rigidly fixed NOW of the narrator x_{sp} . (40) sketches this idea.

$$(40) \quad \lambda \phi \lambda T \lambda R \lambda s. \textit{s is the "now" of } x_{sp} \wedge \forall j (\text{O}(s)\text{-relevant}(j) \wedge sRj \rightarrow \\ [\lambda X' \exists m (X'(m) \wedge \phi(\lambda n. m < n)(s)] (\lambda k. T(j)(k)))$$

¹⁴ Tense is expected after the modal relation R. The composition is motivated and illustrated in the appendix.

This radical deviation from traditional analyses gains us full control over the “time of assessing future options” as part of the semantics of *woll*. The influence of tense could be minimized and the scope of tense is no longer decisive in the shifted reading of the future-in-the-past. Yet, a formal implementation requires substantial changes in the architecture of the semantics of tense and aspect. We have to redefine (a) the logical type of context parameters, (b) the lexical semantics of adverbials and (c) the contribution of tense and aspects in semantic composition. Major changes of an established system are never undertaken without a very good cause. The present study is intended as a first and necessary step in the exploration of perspective shift in the future-in-the-past. One result is that a conservative analysis has to resort to homonyms $woll_{1/2}$; an overall unattractive assumption. The semantics of perspective shift may require us to reconsider most elementary assumptions in the interpretation of tense and aspect. Perspective taking this turns out as a challenging probe of current theories of meaning.

Abbreviations

S_{root} = root clause (comprises untensed verb, arguments and modifiers but still lacks tense and aspect), TENSE = the syntactic unit where tense information is coded, PRESENT = the semantic contribution of present tense morphology, PAST = the semantic contribution of past tense morphology, REF ($\langle sp \rangle, k$) = the speaker $\langle sp \rangle$ has reference time k in mind when uttering the sentence, REF (x, i, j) = the speaker x has in mind reference time j when uttering the sentence at utterance time i , \mathbf{O} = ordering source (for a given modal statement; determines which of the possible worlds are those “most like the actual world” for the purposes of the current modal statement), $\mathbf{O}(s)$ -relevant(j) = the index j is relevant (for modal quantification) according to the current ordering source \mathbf{O} at utterance time s , $\square_{\mathbf{O}(s)}$ = universal quantification over all possible worlds that count as closest to the actual world at utterance time s , FID = free indirect discourse, x_{sp} , x_{speaker} = the parameter for the current speaker (could be shifted in perspective), x_{SPEAKER} = the parameter for the narrator (never shifts perspective), $[[S]]^C$ = the meaning of sentence S as evaluated in utterance context C , $[[S]]^{\langle C, d \rangle}$ = the meaning of sentence S as evaluated in utterance context C and shifted perspective d , \oplus = (the) suitable semantic composition of two parts in a clause; usually functional application, TOMORROW(m', j) = the time index j covers the day after time index m'

Additional File

The additional File for this article can be found as follows:

- **Appendix.** Formal foundations and sample derivations. DOI: <https://doi.org/10.5334/gjgl.199.s1>

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Competing Interests

The author has no competing interests to declare.

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