Tomorrow is not always a day away

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An overlooked fact about *tomorrow* in English is that for some speakers, it allows non-utterance time readings as well as the utterance-time interpretations expected of a pure indexical.

1. Last week, UPS said that the package would be delivered tomorrow...

   (a) **UT reading**: I hope it arrives on time! (b) **Non-UT reading**: It still hasn't shown up!

There are several possible explanations of non-UT readings of *tomorrow*. First, they may be due to Free Indirect Discourse, a literary style where temporal indexicals are interpreted relative to the main character's perspective. Second, *tomorrow* might be anaphoric rather than purely indexical, similar to *now* [1]. A third possibility is that *tomorrow* is a shifty indexical sensitive to speech verb-shifted contexts [10]. Lastly, *tomorrow* might have a perspectival component capable of anchoring to salient event-time perspectives. I present results from a series of experiments showing that non-UT readings of *tomorrow* are acceptable in American English and exploring these four analyses.

Experiment 1: How acceptable are non-utterance time readings?

Experiment 1 tests whether American English speakers accept non-UT interpretations of *tomorrow*. Since the goal is to establish a theory-neutral baseline of acceptability, Exp. 1 uses sentences that were predicted to have non-UT readings on all four accounts. The sentences tested have third-person subjects, since first-person subjects block Free Indirect Discourse interpretations [4]; they also embed *tomorrow* under a speech verb, as required by shifty indexicals. The speech-verb embedding also sets up a salient event-time perspective as required by the perspectival account.

We tested the availability of non-UT interpretations through a comic-captioning task on Mechanical Turk. Participants (n=72) were asked to rate the accuracy of the sentence as a caption for the third panel of a comic (Fig. 1) on a 7-point Likert scale. The ratings for *tomorrow* were compared with three other temporal expressions: the anaphoric *the next day*; the day-of-week name of the second panel (always true); and the day-of-the-week name of the first panel (always false).

Figure 1: Exp. 1 example stimulus

Figure 2: Exp. 1 mean ratings

Day 1	2.9056
Tomorrow	5.2750
The next day	6.3556
Day 2	6.6083

Kevin is angry because Kate said that she would water his plants {tomorrow / the next day / Friday / Saturday}.

The results for Exp.1 show that non-UT interpretations of *tomorrow* are accepted by speakers (Fig. 2). Participants rate non-UT *tomorrow* significantly higher than the bad baseline (paired t-test; $p<0.0001$), but somewhat lower than *the next day* (paired t-test; $p<0.0001$). The fact that the *tomorrow* items are rated lower than *the next day* is not unexpected under a Free Indirect Discourse, shifty indexical, or perspectival account, since these accounts posit either a context or perspective shift, and previous experimental work reports a processing cost for these operations [6, 3].

Experiment 2: Free Indirect Discourse analysis

Having shown that speakers accept non-UT interpretations, we turn to comparing the four analyses sketched above. Experiment 2 tests whether non-UT readings are due to Free Indirect Discourse (FID) effects. Temporal indexicals in FID refer relative to the main character's context rather than the matrix context; thus, one possibility is that participants in Exp. 1 were simply interpreting the

captions as FID. An FID analysis predicts, however, that non-UT interpretations of *tomorrow* are incompatible with first-person subjects, since they refer to the narrator [4]. Exp. 2 tested whether changing the embedding subjects to first-person pronouns affected *tomorrow* ratings.

Figure 3: Exp. 1 mean ratings

Day 1	2.9056
Tomorrow	5.2750
The next day	6.3556
Day 2	6.6083

Exp. 2 example stimulus:
Kevin is angry because I said that I would water his plants {tomorrow/ the next day/ Friday / Saturday}.

Contrary to the predictions of the FID account, the results for Exp. 2 were very similar to Exp. 1, with no significant difference between *tomorrow* ratings in Exp. 1 and Exp. 2 (paired t-test; $p > 0.05$). This shows that non-UT interpretations of *tomorrow* are not due to Free Indirect Discourse.

Debriefing task: Anaphoric analysis

In addition to the main task in Exp. 2, we evaluated the anaphoric account through a post-experiment debriefing. Unlike indexicals, anaphoric expressions can be quantificationally bound. Determining the kind of quantification, however, is not always a trivial task; for instance, *now* allows only quantification over result-states [1]. We compared the acceptability of *tomorrow* and the anaphoric *the next day* in two quantification conditions: over situations and over speech events.

Situations: Whenever I drink red wine, I oversleep {tomorrow / the next day}.

Speech events: Whenever Athena says that it's going to rain, it's sunny {tomorrow / the next day}.

Speakers rated the bound *tomorrow* cases as ungrammatical in all conditions (all < 2.7), while accepting *the next day* (all > 5.7). Given the difficulty in selecting the right referent to quantify over [1], we cannot rule out an anaphoric account, but this is suggestive evidence against one.

Experiment 3: shifted context or salient perspective?

Having argued against the FID and anaphoric accounts, we have two remaining approaches: the shifty indexical account and the perspectival account. Under the shifty indexical account, non-UT interpretations are caused by the speech embedding inducing a context shift [10, 8]. Under a perspectival account, non-UT interpretations are licensed by a salient event-time perspective [9]. In the perspectival view, the sentences in Exp. 1 and 2 have non-UT readings because the subject of the speech verb supplies a salient event-time perspective. These accounts make differing predictions about the obligatoriness of the embedding context. Shifty indexicals require a speech verb to shift; perspectival items require only a salient event-time perspective. We can test these accounts by asking whether non-UT interpretations are still possible if the speech verb is removed.

Exp. 3 example stimulus: It was such a simple chore to water the plants {tomorrow/ the next day / Friday/ Saturday}. I just forgot all about it!

In a planned Experiment 3, speakers will rate sentences that do not embed *tomorrow* under a speech verb, but do provide a salient event-time perspective. If speakers accept these *tomorrow* items, non-UT *tomorrow* should be interpreted as perspectival; if speakers reject them, it will be strong evidence for the shifty indexical account. Either result reveals something interesting about temporal indexicality in English. If the shifty indexical account is superior, this will be the first evidence of a shifty indexical in English. If the perspectival account is correct, then perspective plays a larger role in temporal relations than previously thought, paralleling recent findings for spatial deixis [2]. Thus, this paper highlights an overlooked facet of *tomorrow*, showing that non-utterance time interpretations of *tomorrow* occur outside of Free Indirect Discourse contexts.

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