Temporal Adverbials in Direct and Indirect Discourse

Bachelor's Project Thesis

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Abstract: Kaplan (1989) originally proposed that pure indexicals do not shift in indirect reported speech. An indexical is shifted in indirect speech when the indexical is evaluated with respect to a context different from the current speaker. However, recent research has been chipping away at this claim. One way in which there is a potential to see shifts is in the comparison of direct and indirect reported speech. We did an experiment investigating how English speakers interpret the temporal adverbials 'today', 'tomorrow', and 'yesterday' in direct and indirect speech. 43 participants identified the day of an event. The first hypothesis, based on Kaplan (1989), is that temporal adverbials are pure indexicals and therefore do not shift in indirect reported speech. The second hypothesis, based on Köder (2016), is that temporal adverbials are harder to interpret in direct speech than in indirect speech because direct speech requires a shift of perspective from the current speaker to the original speaker. We found that people gave more answers consistent with the report type in direct speech (93.80%) than in indirect speech (70.93%). The majority of the answers which were not consistent with the report type were consistent with the other report type. In other words, unshifted in indirect speech but shifted in direct speech. Our results do not support either hypothesis and strongly suggest that, contra Kaplan, English grammar allows time indexicals to be shifted in indirect speech.

Keywords: indexicals, temporal adverbials, 'today', 'tomorrow', 'yesterday', discourse, indirect reported speech, direct speech, anaphora, language

1 Introduction

This study set out to determine whether temporal adverbials are pure indexicals and directly referential, as Kaplan (1989) claims them to be. Kaplan (1989) originally proposed that pure indexicals do not shift in indirect speech. The indexical is shifted in indirect reported speech when the indexical is evaluated with respect to a context different from the current speaker.

In direct speech, the utterance is in the perspective of the original speaker. In indirect speech, the utterance is in the perspective of the current speaker. Sentence (1a) is an example of direct and sentence (1b) is an example of indirect speech.

(1) a. Robin said "I'll come today." (*Direct speech*)
b. Robin said that he would come today. (*Indirect speech*)

Temporal adverbials are words in a sentence which identify the time of an event, such as 'today', 'tomorrow', and 'yesterday'. Depending on the report type, direct and indirect reported speech, the reference of temporal adverbials change. In indirect speech these temporal adverbials are referring to a time with respect to the context of the current speaker. However, in direct speech the temporal adverbials denote a time with respect to the context of the original speaker.

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Previous research was done to investigate people's interpretation towards indexicals. Kaplan (1989) claims that 'I', 'today', 'tomorrow', 'yesterday', 'actual', 'present', 'here', and 'now' are pure indexicals. Pure indexicals do not shift in indirect speech. This means that those indexicals do not shift reference to the time of the original utterance. Köder (2016) supports Kaplan's claim that pronouns are pure indexicals. In contrast to this, Hunter (2011, 2013) and Schlenker (2011) show that some of the words in Kaplan's list are not pure indexicals.

We investigated people's interpretation towards temporal adverbials. In theoretical work, Plank (1986) and Eckardt (2015) claim that temporal adverbials are not directly referential. Eckardt (2015) proposed that time-referring words are shiftable indexicals, this means that in indirect speech the temporal adverbials can shift reference to the time of the original utterance.

Based on previous research we formulate two hypotheses. The first hypothesis is derived from Kaplan (1989), and states that temporal adverbials are pure indexicals and therefore do not shift in indirect speech. The second hypothesis is derived from Köder (2016), and states that temporal adverbials are harder to interpret in direct speech than in indirect speech because direct speech requires a shift of perspective from the current speaker to the original speaker.

One way in which there is a potential to see shifts is in the comparison of direct and indirect reported speech. Our experiment investigated how English speakers interpret temporal adverbials in direct and indirect speech, like sentence (2a) and sentence (2b). The participants had to identify the day of an event. The arrow indicates the question asked to the participants.

(2) a. On Monday I met John and he said "My birthday is today." (*Direct speech*)

b. On Monday I met John and he said that his birthday would be today. (*Indirect speech*)

→ Identify the day of John's birthday.

The first hypothesis is that temporal adverbials are pure indexicals and therefore do not shift in indirect speech. We expect that in indirect speech people would give answers only consistent with the report type, that is unshifted in indirect speech.

The second hypothesis is that temporal adverbials are harder to interpret in direct speech than in indirect speech because direct speech requires a shift of perspective from the current speaker to the original speaker. Due to the shift in direct speech, we expect that people would give fewer answers consistent with the report type in direct speech than in indirect speech.

2 Background

2.1 Report type

Talking about an earlier conversation is quite normal in human communication. Imagine a mother telling her daughter Mieke on Monday that Mieke has to clean her room. Tuesday, Mieke tells her friend Judith about her conversation with her mother. Mieke can tell it in two different ways, using direct or indirect speech. In direct speech the speaker (Mieke) quotes the original speaker (the mother), as in (3a). Mieke can do this with a different intonation to emphasise the imitation of her mother. Sentence (3b) is an example of the same conversation with Judith but using indirect speech; in this case the speaker may change the sentence but the content has to be the same as in the original utterance. The quotation marks are signals for direct speech, and the word 'that' is a signal for indirect speech.

(3) a. My mother said: "You have to clean your room." (*Direct speech*)

b. My mother said that I have to clean my room. (*Indirect speech*)

In indirect speech the speaker changes the original sentence so it is similar to the current perspective of the speaker. In contrast to indirect speech, in direct speech the speaker does not change the sentence and the speaker shifts to the perspective of the original speaker.

As a result of shifting perspective, some words may get interpreted differently, for example pronouns. Mieke is referring to herself with the personal pronouns 'you' in (3a) and 'I' in (3b). In sentence (3a) 'you' does not refer to the friend Judith,

the addressee of the current conversation, but it denotes Mieke, the original addressee of her mother's warning. All this is due to shifting perspective.

Besides the personal pronoun, also the possessive pronoun changes as a result of shifting perspectives, yet it still denotes Mieke's room in both cases. Mieke is talking about her own room with the possessive pronoun 'your' in (3a) and in (3b) with the possessive pronoun 'my'.

Temporal adverbials can change in meaning the same way as pronouns. To refer to the correct time, sometimes the temporal adverbial has to change. Consider the earlier example that the mother tells her daughter Mieke on Monday that she has to clean her room, and Mieke talks to her friend Judith about this on Tuesday. Mieke is the speaker of sentence (4).

(4) a. My mother said: "Your room has to be cleaned today." (*Direct speech*)

b. My mother said that my room had to be cleaned yesterday. (*Indirect speech*)

c. ? My mother said that my room has to be cleaned today. (*Indirect speech*)

Sentence (4a) is direct speech, so Mieke is quoting her mother, the perspective of the story is in the perspective of the mother. This means that 'today' denotes the day of the mother's utterance, Monday.

In the indirect sentence (4b), Mieke tells Judith the story from her own here-and-now perspective. In that case 'today' denotes Tuesday, so Mieke does not use 'today' to refer to Monday in indirect speech. To report the conversation with her mother in indirect speech, Mieke could use sentence (4b).

In (4c) Mieke uses 'today' on Tuesday to mean Monday. This is then a shifted use of 'today' and is the controversial usage we are investigating.

2.2 Indexicals

An indexical is an expression that is dependent on the context such as 'I', 'here', 'now', 'he', 'she', and 'this'. The reference can change depending on the situation. For instance, if Tim and Iris each utter 'I am tired', Tim wants to say that he is tired, and Iris wants to say that she is tired.

Indexicals can be classified into different types, depending on how their references are determined in a context. Kaplan (1989) claims that there are true demonstratives ('he', 'she', 'his', 'her', and 'that') and pure indexicals ('I', 'today', 'tomorrow', 'yesterday', 'actual', 'present', 'here', and 'now'). Kaplan (1989) says that the reference of a true demonstrative depends on the speaker's intentions. For instance, 'that' can refer to different objects depending on the speaker's pointing gestures. Also, 'he' is referring to someone who is pointed to, and 'he' can vary in different contexts. This is contrary to pure indexicals, for which no demonstration is required. According to Kaplan (1989), a pure indexical such as 'I' is always referring to the speaker of the utterance, and the speaker does not have to point to him or herself. Likewise, 'tomorrow' is always referring to the day after the day of the utterance, and no pointing gesture is required.

Kaplan (1989) claims that pure indexicals are directly referential. This means that the content of the indexical is the object which it denotes. For example, the content of the indexical 'I', in a particular context, is the speaker. The word only denotes something in the actual world, the real world here-and-now. Nothing what is said in the discourse can change this.

Kaplan (1989) originally proposed that pure indexicals do not shift, except in direct speech. In direct speech the current speaker ignores his own perspective, and shifts to the perspective of the original speaker. In indirect speech the current speaker maintains to his own perspective. We say that the indexical is shifted in indirect speech when the indexical is evaluated with respect to the context of the original speaker instead of the context of the current speaker. One way in which there is a potential to see shifts is in the comparison of direct and indirect speech.

However, recent research has been chipping away at Kaplan's claim. Several studies have documented that some words of Kaplan's list are not pure indexicals, among others the word 'now'.

Generally, 'now' is interpreted as the utterance's time and it does not refer to a time introduced in a discourse. However, Hunter (2011) has contradicted Kaplan's claim that 'now' is a pure indexical. In sentence (5) (from Hunter (2011)) the author is writing about her mother's struggles with Alzheimer's disease.

(5) Five months later, I sat with her as she lay

in bed, breathing thin slivers of breath and moaning... I was alone in her bleak room. Alone, because there was none of her in it, just a body that *now* held no essence of my mum.

In sentence (5) 'now' denotes a time that is in the past of the utterance time and is introduced earlier in the discourse. Hunter (2013) also has shown that 'actual', 'actually', and 'here' are not pure indexicals.

Besides Hunter (2011, 2013) there are more researchers who disagree with Kaplan's list of pure indexicals. Schlenker (2011) famously challenged Kaplan's analysis by showing that in some languages some indexicals, like 'I' and 'you', may be shiftable and thus are not pure indexicals. Schlenker (2011) uses cross-linguistic and theoretical arguments to show that 'I' and 'you' are not pure indexicals. In languages like Amharic, the words 'I' and 'you' do not always refer to the utterance speaker and addressee. In those languages some indexicals do not refer to something in the context of the utterance, but to the context of the original speaker. In those languages the 'I' in (6) denotes Catherine, the 'I' in her original utterance, which results in Catherine being the hero. In English the speaker of (6) is a hero. We say that the indexical is shifted because it is evaluated with respect to a context that is different from the context of the current utterance.

(6) Catherine says that I am a hero.

Not all researchers contradict Kaplan (1989): Köder (2016) did research on how people interpret pronouns in direct and indirect speech. Köder (2016) found that especially children, but also adults, make more mistakes when interpreting pronouns in direct speech than in indirect speech. This means that people find it hard to interpret pronouns in direct speech; we could say that they are not able to replace the current speaker with the original speaker. The errors the participants made are that they thought 'I' denotes the actual speaker, even in direct speech. This supports Kaplan's claim that pronouns are pure indexicals.

In summary, Kaplan (1989) claims that 'I', 'today', 'tomorrow', 'yesterday', 'actual', 'present', 'here', and 'now' are pure indexicals. Pure indexicals are directly referential in indirect speech, so they refer to the actual world. Hunter (2011, 2013) had evidence that 'now', 'actual', 'actually', and 'here' are not pure indexicals. Schlenker (2011) shows that 'I' and 'you' are not pure indexicals. On the other hand, Köder (2016) supports Kaplan's claim that pronouns are pure indexicals.

2.3 Temporal adverbials

From Kaplan's list of pure indexicals only 'present', 'today', 'tomorrow', and 'yesterday' are left. At first sight, it looks like temporal adverbials are directly referential, see (7), (8), and (9). The time indexical denotes the day in relation with the current day.

(7) Nov 15, 2012 - The Google Play website said that the estimated shipping date would be today, November 15th 2012. [‡]

(8) Narine who has gone back home after his father's demise would be available from the second match against Mumbai Indians April 13, Gambhir said while adding that another West Indian Andre Russell would be available for tomorrow's match against Delhi Daredevils. [§]

(9) A forecast issued by the Turkish State Meteorological Service said that air quality would be very poor yesterday evening. [¶]

However, in theoretical work, Plank (1986) and Eckardt (2015) claim that temporal adverbials are not directly referential. Eckardt (2015) proposed that time-referring words such as 'next week' are shiftable indexicals, and 'now' and 'tomorrow' can also shift reference to time of the original utterance.

Likewise, indexicals which refer to a mood or feeling can denote the original speaker in indirect speech. Sentence (10) and (11) are examples from Eckardt (2015). In sentence (10) Anna talks to her friend Merel. 'Thank God' expresses Anna's relief. If someone else than Anna said sentence (10), for

[‡]From: *http://trendblog.net/google-cant-handle-uk-nexus-4-sales-and-delays-shipping-3-weeks/* Date: 2016, June 13

[§]From: *http://indianexpress.com/article/sports/cricket/ipl-2016-you-will-see-the-best-of-sunil-narine-this-year-says-gautam-gambhir/* Date: 2016, June 13

[¶]From: *http://www.tradearabia.com/news/HEAL$_2$79707.html* Date: 2016, June 13

example Kim, then 'Thank God' expresses Kim's relief.

(10) Thank God my classes will be over next week.

Merel can tell someone else about her conversation with Anna by saying sentence (11). 'Thank God' still expresses Anna's relief, despite that (11) is in indirect speech and the possessive pronoun 'my' from (10) is changed into 'her' in (11). When someone else than Merel - for instance Rayan - says sentence (11), then 'Thank God' will still express Anna's relief.

(11) Anna said that, thank God, her classes were over next week.

Similary, the temporal adverbial 'next week' in sentence (10) refers to Anna's perspective, so the week after her utterance. When two months later, Merel tells someone else about her conversation with Anna by saying sentence (11), the temporal adverbial 'next week' still refers to the week after Anna's utterance and not to the week after Merel's utterance.

Although theoretical work of Plank (1986) and Eckardt (2015) show that temporal adverbials are not directly referential, there is no experimental research on temporal adverbials. Therefore, we decided to do an experiment. One way in which there is a potential to see shifts is in the comparison of direct and indirect speech. Therefore, we did an experiment with utterances in direct and indirect speech, just like Köder (2016) did.

2.4 Hypotheses

Based on the previous research, we formulate two hypotheses. Kaplan (1989) claims that temporal adverbials are pure indexicals. This means that they are directly referential and do not shift. We say that the indexical is shifted in indirect speech when the indexical is evaluated with respect to the context of the original speaker instead of the context of the current speaker. The first hypothesis is that temporal adverbials are pure indexicals and therefore do not shift in indirect speech. We expect that in indirect speech people interpret temporal adverbials consistent with the report type, in other words unshifted in indirect speech.

The second hypothesis derives from Köder's (2016) findings. Köder (2016) found that pronouns are harder to interpret in direct speech than in indirect speech because of the shift of perspective. In indirect speech the utterance is in the perspective of the current speaker, but in direct speech the utterance is in the perspective of the original speaker. If we extrapolate these findings, we expect that the same would apply to temporal adverbials.

The second hypothesis is that temporal adverbials are harder to interpret in direct speech than in indirect speech because direct speech requires a shift of perspective from the current speaker to the original speaker. We expect that people give more answers consistent with the report type in indirect speech than in direct speech when interpreting temporal adverbials.

To test these hypotheses, we made an online questionnaire with direct and indirect speech utterances. The participants had to identify the day when an event took or will take place.

3 Method

We did a three by two study, comparing the factors temporal adverbials ('today', 'tomorrow', and 'yesterday') and report type (direct and indirect reported speech). The experiment was in the form of an online questionnaire. There were 48 utterances the participants had to read and say which day of the week they thought the event was.

There were 24 target sentences, these sentences are in the format of sentences (12). Each participant saw only one version of each sentence, so they got only one sentence from (12a) till (12f).

Sentences (12a), (12b), and (12c) are reported in indirect speech. In the indirect sentences of the experiment (sentences (12a), (12b), and (12c)) we used 'would' + *infinitive*. We did this because there were complications when we used the past tense verb or the present tense verb.

The sentences (12d), (12e), and (12f) are reported in direct speech. The arrow indicates the question asked to the participants.

(12) a. On Monday I met John and he said that his birthday would be today.

b. On Monday I met John and he said that his birthday would be tomorrow.

c. On Monday I met John and he said that his birthday would be yesterday.

d. On Monday I met John and he said "My birthday is today."

e. On Monday I met John and he said "My birthday is tomorrow."

f. On Monday I met John and he said "My birthday was yesterday."

→ Identify the day of John's birthday.

In the experiment there were also 24 control sentences without a speech report, like sentence (13). The arrow indicates the question asked to the participants.

(13) Today I am going to my first aqua aerobics class.
→ Identify the day of my first aqua aerobics class.

The participants had to identify the day by clicking the day they thought the event happened, from radio buttons with all seven days of the week. Figure 3.1 and figure 3.2 show screenshots from the sentences in the experiment.

Before the experiment the participants got the following task instructions: *In this survey you'll be given 48 utterances describing certain events that took place (or will take place) some time this week. After each sentence you are asked on what day of the week the event is said to take place. Remember, today is Thursday, May 12th. When reading the sentences, imagine I'm talking to you directly, here and now, to inform you about events occurring some time this week (that is, between Sunday, May 8th, and Saturday, May 14th). At the end there are also four biographical questions.*

During the experiment, the participants had to imagine that they were being talked to directly in the here-and-now. To ensure that all the participants had the same real world situation we did the experiment on Thursday. In the instructions we emphasized the fact that it was Thursday and that it stayed Thursday throughout the whole experiment. We did this so that the participants would be conscious about the day.

In sentence (12) the day John said something is Monday, we call the day someone said something the utterance time. In the experiment the utterance time was Sunday, Monday, or Tuesday. The utterance time was not one of the other days of the week because other days of the week would be unlikely. Wednesday was not suitable because the sentence would be about the day before Thursday and in that situation you can also say 'yesterday'. Thursday was not suitable because that was the experiment day and that would be confusing. Friday was not suitable because then the sentence would be about the day after Thursday and in that situation you can also say 'tomorrow'.

In the utterances in the experiment we used the temporal adverbials 'today', 'tomorrow', and 'yesterday'. The temporal adverbial refers to the day an event took or will take place. We call this the reported time, because the reported event happened on that day.

4 Results

Subjects were recruited via Amazon Mechanical Turk service and were paid 65¢ for participation. In the experiment 43 participants (20 women, mean age = 41.86, range 22-61 year) participated. All the participants reported English as their native language. The majority of the participants did the experiment on Thursday 12th of May 2016. The others did the experiment on Thursday 2nd of June 2016.

Figure 4.1 shows the accuracy of the answers consistent with report type by report type and temporal adverbial. From the chart, it can be seen that people answered more consistently with the report type in direct speech than in indirect speech. In other words unshifted in indirect speech but shifted in direct speech. In indirect speech 70.93% of the answers were consistent with the report type, in comparison with 93.80% in direct speech.

The results also show that people gave more answers consistent with the report type in indirect speech with the temporal adverbials 'today' and 'yesterday', than with the temporal adverbial 'tomorrow'. This can be seen in figure 4.1. In direct speech there is no difference between the temporal adverbials 'today', 'tomorrow', and 'yesterday'.

We analysed responses using logistic mixed-effect models (Baayen et al., 2008). The fixed effects

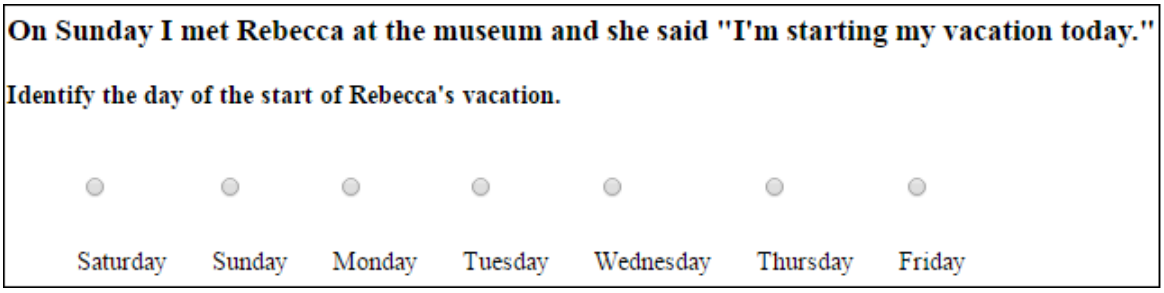

Figure 3.1: A screenshot of the experiment of a direct speech sentence with temporal adverbial 'today'. The experiment day is Thursday, the utterance day is Sunday and the reported day is 'today'.

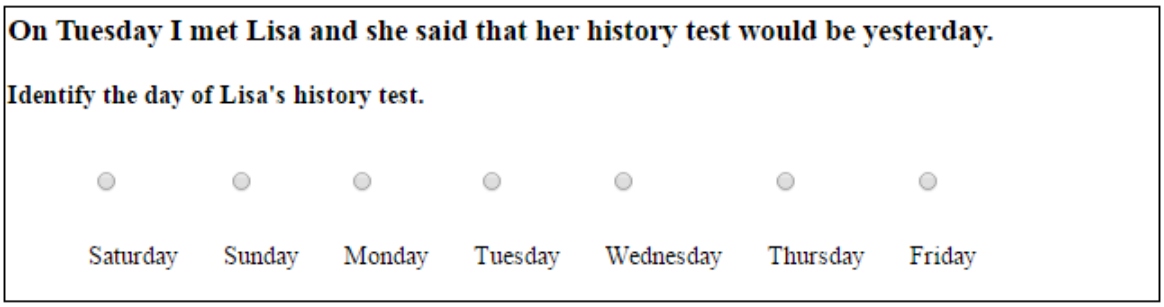

Figure 3.2: A screenshot of the experiment of an indirect speech sentence with temporal adverbial 'yesterday'. The experiment day is Thursday, the utterance day is Tuesday and the reported day is 'yesterday'.

were temporal adverbials ('today', 'tomorrow', and 'yesterday') and the report type (direct and indirect reported speech). The participants and items were the random effects, including random slopes (Jaeger, 2008). We did a stepwise comparison of models starting with the most complex one and including random slopes for participants and items. AIC values were compared to determine which model best fit the data, with a complex model being preferred over a simpler model, only if its AIC value was lower by at least two. The model that explained significantly more variance included a random slope for report type for participant. The best model is shown in table 4.1. This table shows that there is a main effect for report type and an additional main effect for temporal adverbial.

We distinguish three types of answers. The first answer type is when the participant gave an answer consistent with the report type, so unshifted in indirect speech but shifted in direct speech. The second answer type is when the participant gave an answer which was not consistent with the report type, so shifted in indirect speech but unshifted in direct speech. This means that in indirect speech the temporal adverbial is evaluated with respect to the original speaker, and in direct speech the temporal adverbial is evaluated with respect to the current speaker. The answer is chosen as a result of shifting perspective. The third answer type is an error; the participant chose a day which is wrong regardless of the interpretation of the report type. In this situation the answer of the participant is a completely different day than the day it would be by interpretation of the sentence as direct or indirect speech. Table 4.3 and table 4.2 show the amount of answers consistent with the report type, the amount of answers consistent with the other report type, and the amount of errors.

In indirect speech most of all answers were consistent with the report type (70.93%), one fourth of all answers were consistent with the other report type

(26.16%), and a few of them were errors (2.91%). In direct speech almost all answers were consistent with the report type (93.80%), and the amount of answers consistent with the other report (3.88%) were approximately the same as the amount of errors (2.32%).

5 Discussion

Based on the previous research, we formulated two hypotheses.

Based on Kaplan (1989), the first hypothesis is that temporal adverbials are pure indexicals and therefore do not shift in indirect speech. We expected that in indirect speech people interpret temporal adverbials consistent with the report type, in other words unshifted in indirect speech. Contrary to what we expected, we found that one fourth of the answers in indirect speech were consistent with the other report type. Therefore we reject the first hypothesis.

The findings of this study do not support Kaplan's claim. This suggests that Kaplan's claim that temporal adverbials are pure indexicals and do not shift is wrong. Therefore, it is possible, that the English grammar allows time indexicals to be shifted in indirect speech.

Based on Köder (2016), the second hypothesis is that temporal adverbials are harder to interpret in direct speech than in indirect speech, because direct speech requires a shift of perspective from the current speaker to the original speaker. We expected that people give more answers consistent with the report type in indirect speech than in direct speech when interpreting temporal adverbials. Contrary to what we expected, people gave more answers consistent with the report type in direct speech than in indirect speech. In indirect speech, the majority of the answers which were not consistent with the report type were consistent with the other report type, in other words shifted in indirect speech. Therefore we also reject the second hypothesis.

As a result of our study we can say that people find it harder to interpret temporal adverbials in indirect speech than in direct speech.

We see in table 4.2 and table 4.3 that people do not often make errors, but people have the tendency to interpret the temporal adverbial as the day it would be in the other report type. The experiment day was Thursday and in that case a temporal adverbial in an indirect utterance refers to the real world, so in (14) 'today' would refer to Thursday. However, in one fourth of the occasions people identify Monday as the day of the birthday.

People do not often make errors such as identifying Saturday as the day of the trip. Saturday is wrong whether (14) is interpreted as indirect or direct. In neither case the day of the trip would be Saturday.

(14) On Monday I met Guus and he said that he would go to Chicago today.

Because people do not make random mistakes but interpret temporal adverbials consistent with one of the two report types, people are conscious about the experiment time and the utterance time.

Hunter (2013) also disagreed with Kaplan's claim that time indexicals are pure indexicals. Hunter (2013) gives a theory about indexicals. Hunter (2013) proposed that indexicals are anaphora which are linked to a salient anchor. Anaphora are words that refer to something. There are two possible anchors to which an indexical could be linked, the indexical anchor and the anaphoric anchor. I will explain these anchors with an example.

The experiment day was Thursday, so imagine that today is Thursday, this is the actual world and nothing what is said in the discourse can change this. Hunter (2013) calls all the knowledge about the actual world K_0. In sentence (15) there are two possible anchors for the interpretations of the reported day 'today'.

(15) On Monday I met Manon and she said that her yoga course would be today.
Imagine K_0=*Thursday*

The first anchor is the indexical anchor, the day in the actual world, also known as K_0. The day of K_0 in (15) is Thursday. The second anchor is the anaphoric anchor. This is the day earlier mentioned in the discourse, in sentence (15) this is the utterance day Monday.

As Hunter (2013) states, indexicals are linked to a salient anchor. In two-thirds of the indirect sentences people prefer the indexical anchor to be salient, this means that the indexical is evaluated with respect to the context of K_0. In one fourth of the sentences people prefer the anaphoric

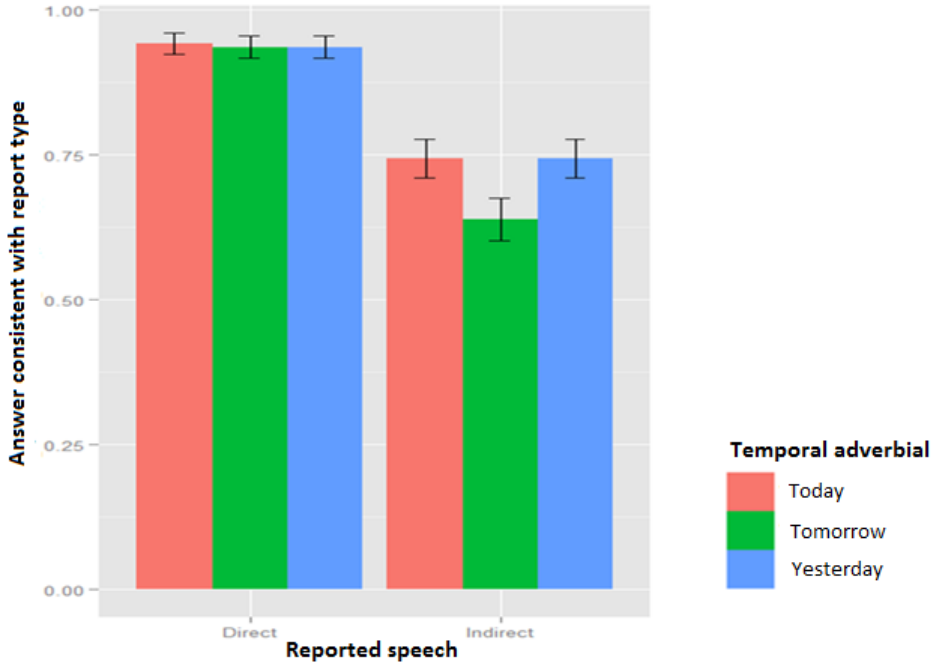

Figure 4.1: Mean answers consistent with report type with standard error for report type and temporal adverbial.

Table 4.1: Best Model = Consistent with report type ∼ temporal adverbial + report type + (1 + report type | Participant)

	Estimate	Standard Error	z-value	p-value
Intercept (direct, tomorrow)	6.7160	1.7813	3.770	0.000163 ***
Temporal adverbial: Yesterday	0.9747	0.3401	2.866	0.004156 **
Temporal adverbial: Today	1.0401	0.3435	3.028	0.002464 **
Report type: Indirect	-5.4128	1.8886	-2.866	0.004157 **

Table 4.2: Amount of answers per answer type in direct speech

	Today	Tomorrow	Yesterday
Consistent with report type (*Interpreted as direct*)	162	161	161
Consistent with the other report type (*Interpreted as indirect*)	7	6	7
Error	3	5	4

Table 4.3: Amount of answers per answer type in indirect speech

	Today	**Tomorrow**	**Yesterday**
Consistent with report type (*Interpreted as indirect*)	128	110	128
Consistent with the other report type (*Interpreted as direct*)	42	56	37
Error	2	6	7

anchor to be salient, this means that the indexical is evaluated with respect to the context of the original speaker. Hunter's (2013) proposal would be a good explanation for time indexicals. People 'choose' whether the indexical anchor or the anaphoric anchor is more salient. We tried to make the indexical anchor as obvious as possible, by mentioning the day of the experiment a couple of times in the instructions, but people still shift 30% of the time.

Besides the results that lead to the rejection of the first hypothesis and the rejection of the second hypothesis, the results also show that in indirect speech people gave less answers consistent with the report type with temporal adverbial 'tomorrow' than with 'today' or 'yesterday'. There is no significant difference between 'today' and 'yesterday', but there is a significant difference between 'today' and 'tomorrow'. The fact that people have to calculate to identify the day when the temporal adverbials 'tomorrow' and 'yesterday' are used, could be a reason why people answer differently with the temporal adverbial 'tomorrow'. The workload is higher with the reported time 'tomorrow' and 'yesterday'. For sentence (16) the participants had two days that they had to keep in mind. They had to keep in mind the actual day, also known as K_0, namely Thursday. Furthermore they had to keep in mind the utterance day, namely Tuesday. The arrow indicates the question asked to the participants.

(16) a. On Tuesday I met Brenda and she said that her driving test would be today.

b. On Tuesday I met Brenda and she said that her driving test would be tomorrow.

c. On Tuesday I met Brenda and she said that her driving test would be yesterday.

→ Identify the day of Brenda's driving test.
Imagine K_0=*Thursday*

Sentence (16a) is in indirect speech with the reported day 'today'. When a participant gave an answer consistent with the report type, so maintaining the perspective of the current utterance time, then the driving test would be on Thursday. When the participant gave an answer consistent with the other report type, shifting to the perspective of the original utterance time, then the driving test would be on Tuesday. The participant did not have to think about which day comes before or after Tuesday or Thursday, because the sentence is about 'today'.

Sentence (16b) is in indirect speech with the reported day 'tomorrow'. When a participant gave an answer consistent with the report type, so maintaining the perspective of the current utterance time, then the driving test would be on Friday. When the participant gave an answer consistent with the other report type, shifting to the perspective of the original utterance time, then the driving test would be on Wednesday. Furthermore, the participant had to think about which day comes after Tuesday or Thursday, because the sentence is about 'tomorrow'. This could result in more workload.

Sentence (16c) is in indirect speech with the reported day 'yesterday'. When a participant gave an answer consistent with the report type, so maintaining the perspective of the current utterance time, then the driving test would be on Wednesday. When the participant gave an answer consistent with the other report type, shifting to the perspective of the original utterance time, then the driving test would be on Monday. Furthermore, the participant had to think about which day comes after Tuesday or Thursday, because the sentence is about

'yesterday'. This could result in more workload.

The results of the experiment show that in indirect speech people gave more answers consistent with the report type with the temporal adverbials 'today' and 'yesterday'. This means that 'tomorrow' is harder to calculate.

Before this experiment we did two other experiments, experiment A and experiment B, which had a number of potentially confounding factors. We eliminated these factors. In the sections 5.1, 5.2, and 5.3 I will discuss the changes we made and the justifications for those changes.

5.1 Experiment A

Sentence (17) is an example of a sentence in indirect speech with the temporal adverbial 'today' from experiment A. Just like in the current experiment, there were six versions of this sentence, comparing the factors temporal adverbials ('today', 'tomorrow', and 'yesterday') and report type (direct and indirect reported speech). The arrow indicates the question asked to the participants.

(17) You meet me on Saturday. I say: On Wednesday I met John and he said that his birthday is today.
→ When is John's birthday?

In experiment A the participant had to take into account three days and the temporal adverbial. I will explain the three days with the scenario of sentence (17). Firstly, the participant is aware of the day of K_0, this is the day on which the participant did the experiment. Secondly, the participant reads 'You meet me on Saturday. I say', so the participant has to remember Saturday as the meeting day with the current speaker. On the meeting day the current speaker tells the participant about an earlier conversation he had with someone else. Thirdly, the participant reads 'On Wednesday I met John and he said', so the participant has to remember Wednesday as the utterance time when John said something. On top of that, the participant has to take into account the reported time, this is the temporal adverbial; in sentence (17) this is 'today'. In illustration, when the participant did the experiment on Monday, the participant has to remember Monday (K_0), Saturday (meeting day), Wednesday (utterance time), and 'today' (the reported time). All this is confusing.

In experiment A 47 participants (20 women, mean age = 37.49, range 22-69 year) participated. All the participants reported English as their native language. In the indirect sentences of experiment A 66.11% of all the answers were consistent with the report type, in other words unshifted in indirect speech. In the direct sentences of experiment A 92.82 % of all the answers were consistent with the report type, in other words shifted in direct speech. The results of experiment A were contrary to what we expected. We expected that people give more answers consistent with the report type in indirect speech than in direct speech when interpreting temporal adverbials 'today', 'tomorrow', and 'yesterday'. However, the results of experiment A show that people gave more answers consistent with the report type in direct speech than in indirect speech. Therefore, we took a closer look at experiment A and detected some flaws. We then decided to change experiment A into experiment B.

5.2 Experiment B

In retrospect we thought that the phrase 'You meet me on [*day of the week*]' in experiment A is too confusing, because the participant had to take three days into account; the day of K_0, the meeting day, and the utterance day. Thus we decided to remove the phrase 'You meet me on Saturday. I say:' and do the experiment again.

We wanted the meeting day, when the current speaker said something, would be the same day as K_0. Therefore, we chose one day to do the experiment, in our case Thursday. Some sentences were rephrased so the utterance time was not on Thursday, but only Monday, Tuesday, or Wednesday.

These three changes resulted in experiment B. The three changes towards experiment A were (i) deleting the phrase 'You meet me on Saturday. I say:', (ii) running the experiment on Thursday, and (iii) changing the utterance time to Monday, Tuesday, and Wednesday. Sentence (18) is an example of a sentence in indirect speech with the temporal adverbial 'today' from experiment B. Just like in the current experiment, there were six versions of this sentence, comparing the factors temporal adverbials ('today', 'tomorrow', and 'yesterday') and report type (direct and indirect reported speech).

The arrow indicates the question asked to the participants.

(18) On Monday I met John and he said that his birthday is today.
→ When is John's birthday?

In experiment B 47 participants (27 women, mean age = 40.38, range 25-69 year) participated. All the participants reported English as their native language. In the indirect sentences of experiment B 51.26% of all the answers were consistent with the report type, in other words unshifted in indirect speech. In the direct sentences of experiment B 93.18% of all the answers were consistent with the report type, in other words shifted in direct speech.

The results of experiment B were contrary to what we expected. We expected that people give more answers consistent with the report type in indirect speech than in direct speech when interpreting temporal adverbials 'today', 'tomorrow', and 'yesterday'. However, the results of experiment B show that people gave more answers consistent with the report type in direct speech than in indirect speech. Therefore, we took a closer look at experiment B and detected some flaws. We then decided to change experiment B into the current experiment.

5.3 Current experiment

We changed experiment B so it became the current experiment. In experiment B the utterance time was Monday, Tuesday, or Wednesday. Experiment B was run on Thursday. When the utterance time was Wednesday and the experiment day was Thursday you refer to the day before as Wednesday and not as 'yesterday', which does not feel natural. Therefore we changed the utterance time to Sunday, Monday, and Tuesday. For all the days, especially Sunday, we took into account the real world expectancies, such as there is no class on Sunday.

Furthermore, the question which the participants had to answer in experiment A and experiment B were 'When is John's birthday?' or 'When was John's birthday?'. The tense of the question could bias the participant to choose a particular answer. The question for the participant in the current experiment was in case of John's birthday 'Identify the day of John's birthday.'

The tense of the verb in the sentences was also something we had to change. Experiment A and experiment B were both in the present tense or past tense, and we changed the sentences to 'would' + *infinitive*. We did this because there were complications when we used the past tense verb or the present tense verb.

Sentence (19) is written in the simple past tense. This sentence is actually ambiguous, Linda could have said (19a) or (19b). Ogihara and Sharvit (2012) say that (19a) is simultaneous reading, the original speaker said that her current mood is happy. Sentence (19b) is back-shifted reading, the original speaker said that ten years ago she was happy but she did not say anything about her current mood. In simultaneous reading the original utterance is in the present tense, and in back-shifted reading the original speaker told something that was already in the past and he or she used the past tense.

(19) Linda said that she was happy.
  a. Linda said "I am happy now."
  b. Linda said "I was happy ten years ago."

Furthermore, the present tense adds additional interferences. Sentence (20) is an example of the present tense verb. Ogihara and Sharvit (2012) say that this reading is the so-called "double access" reading. In this case Linda said her mood is the same as happy, *and* at the time of the creation of sentence (20) she is still happy. So, her happy mood was at least two weeks.

(20) Two weeks ago Linda said that she is happy.

As a result of those two complications, we used 'would' + *infinitive*. The events in the indirect sentences of the experiment are in the future during the utterance. Imagine you are living in a world and today is Tuesday.

(21) On Saturday, Gijs said that his concert would be yesterday.

Sentence (21) implies that Gijs was talking about the future, while he probably used the present tense to say it, like sentence (22).

(22) My concert is on Monday.

The examples (7), (8), and (9) show that it is possible to use 'would' + *infinitive* for the past, present and future.

As a result of changing the tense and the question towards the participants, some sentences also had to be rephrased. For example sentence (23a) was changed into (23b).

(23) a. I have a history test today.
b. My history test would be today.

These four changes resulted in the current experiment. The changes towards experiment B were (i) changing the utterance time to Sunday, Monday, and Tuesday (ii) rephrasing of the question, (iii) changing the tense in the sentences and (iv) rephrasing the sentence.

In the experiment 43 participants (20 women, mean age = 41.86, range 22-61 year) participated. All the participants reported English as their native language.

In the indirect sentences of the current experiment 70.93% of all the answers were consistent with the report type, in other words unshifted in indirect speech. In the direct sentences of the current experiment 93.80% of all the answers were consistent with the report type, in other words shifted in direct speech.

6 Conclusions

This study set out to determine whether temporal adverbials are pure indexicals and directly referential, as Kaplan (1989) claims them to be. Kaplan (1989) originally proposed that pure indexicals do not shift, so the indexical is only evaluated with respect to the context of the current speaker, the here-and-now. We used an experiment with 48 utterances to investigate how people respond to the temporal adverbials 'today', 'tomorrow', and 'yesterday' in direct and indirect reported speech.

Based on previous research we formulated two hypotheses. The first hypothesis is derived from Kaplan (1989), and states that temporal adverbials are pure indexicals and therefore do not shift in indirect speech. The second hypothesis is derived from Köder (2016), and states that temporal adverbials are harder to interpret in direct speech than in indirect speech because direct speech requires a shift of perspective from the current speaker to the original speaker. Both the first hypothesis and the second hypothesis are rejected. The findings of this study do not support Kaplan's claim. Therefore, it is possible that the English grammar allows time indexicals to be shifted in indirect speech.

Hunter (2013) has a theory about indexicals. According to Hunter (2013) indexicals are linked to a salient anchor. The indexicals could be linked to the actual world, the indexical anchor, or it could be linked to something earlier mentioned in the discourse, the anaphoric anchor. An explanation for our results could be that in indirect speech temporal adverbials could also be linked to the anaphoric anchor and not only to the indexical anchor.

A possible follow-up research could investigate what happens when the indexical anchor is more salient. This could be tested by a spoken experiment. Our experiment was an online questionnaire, in which the participant had to click which day they thought the event took place or will take place. In a spoken experiment there would be an actor and a participant. The actor talks to the participant about his friends. A possible difference between a spoken experiment and a written one is the awareness of the real world (K_0). To do the experiment in a real life setting the participant will get the feeling that it is real and the participant could be more aware of the experiment day. Therefore the temporal adverbials are linked to the experiment day, this means that the indexical anchor is more salient than the anaphoric anchor.

Another advantage of a spoken experiment is that in an spoken experiment the actor can use intonation. In spoken language, intonation of a sentence is really important. Saying the same sentence but using different intonations, the sentence gets another meaning. It would be interesting to compare the findings of this experiment with the findings of a spoken experiment. The actor can variate in pitch, accent, and intonation. This way the actor can mimic the original person's voice.

Another explanation for our results could be that there is little distinction between direct and indirect discourse in English. The quotation marks and the word 'that' are indications for respectively direct and indirect discourse. However, in English it

is also possible to use indirect speech without the word 'that', for example sentence (24a) is semantically the same as sentence (24b). Both sentence (24a) and sentence (24b) are in indirect speech.

(24) a. Harmke told him that she was happy.
b. Harmke told him she was happy.

Because of the little distinction between direct and indirect speech in English, it could be that people do not make distinctions between these two report types. In other words, people mix the two report types. This could be an explanation for the results from the indirect sentences. However, if people mix the two report types then this should also be seen in the results of the direct sentences, which is not the case.

In a spoken experiment the actor can make the contrast between direct and indirect speech bigger. The variation in intonation and awareness of K_0 could lead to different results. The expectation is that in the spoken experiment the difference between direct and indirect speech is more perceptible and the participant is more aware of K_0 than in the written experiment. This will lead to more answers consistent with the report type, in other words unshifted in indirect speech but shifted in direct speech, than in our experiment.

The experiment should be repeated in a different language. As said above, in English the distinction between direct and indirect speech is vague. In some other languages this difference is more clear, for example in Dutch. Sentence (25a) and sentence (25b) are examples of a Dutch sentence in direct and indirect speech.

(25) a. George zegt: "Zij is bang." (*Direct speech*)
[George says "She is scared."]
b. George zegt dat zij bang is. (*Indirect speech*)
[George says that she is scared.]

In English the quotation marks indicates a direct sentence, furthermore if present the word 'that' indicates an indirect sentence. The word 'that' does not always have to be present, as sentence (24). In Dutch the word 'dat' (translation of 'that') always has to be present. Besides that in Dutch the word order in direct sentences differs from the word order in indirect sentences. This is another clue for which report type is used in the utterance. In Dutch there are more indications for the report type. If Dutch is used for an experiment, the results could be different from an English experiment. Because the distinction between direct and indirect speech is more obvious in Dutch, the expectation is that in the Dutch experiment the difference between direct and indirect speech is more perceptible than in the English experiment. This will lead to more answers consistent with the report type, in other words unshifted in indirect speech but shifted in direct speech, than in our experiment.

There is still an issue with the analysis from Hunter (2013). Hunter's (2013) proposal that indexicals are linked to a salient anchor could be used in the majority of the sentences. But still, there are sentences where the time indexical cannot be in relation with the time earlier mentioned in the sentence. Looking at sentence (26), the temporal adverbial 'today' cannot refer to Wednesday, but it denotes the real world day.

(26) On Wednesday I met Janne, and today I got ill.

It seems that Kaplan (1989) sometimes is right about indexicals. Kaplan (1989) claims that indexicals do not shift and they are only directly referential. The words 'one day ago' and 'yesterday' mean the same thing, *day−1*. Sentence (27) (example from Kaplan (1989)) is a grammatically correct sentence, and implies that John yawned the day before yesterday. Contrary to sentence (28), which is a grammatically incorrect sentence.

(27) One day ago it was the case that one day ago it was the case that John yawned.

(28) *Yesterday it was the case that yesterday it was the case that John yawned.

All this would be a fruitful area for further research. Considerably more work will need to be done to determine the truth about indexicals.

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