

WEBBER (1988) TENSE AS DISCOURSE ANAPHOR

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1 THE INTUITION

- Just like *John* is picked up by the pronoun *he* in the following clause, it seems like the time in which the event described by the second sentence is directly dependent on the time in which the event described by the first sentence takes place.

(1) John partied until 3am. He came home and went to bed.

- Let's think about how we resolve nominal anaphora, and then apply the same insights to temporal anaphora.
- Crucial, as with nominal anaphora, it seems like we use the entities introduced in previous discourse along with the structure of that discourse to integrate later tensed clauses and the events they describe into the discourse.
- We will see that:
 1. Our temporal entities are Event Times (ET) and Reference Times (RT).
 2. The associated events are structured following Moens and Steedman, whereby an event is composed of a preparatory phase, a culmination, and a consequence phase.
 3. We have a temporal focus structure which orders salient temporal entities. We can have multiple such structures, in which case we store those we are not attending to in a stack.
- At every step of the way, though, let's be sure to check to make sure our analogies hold up. This way we will be sure to understand both the similarities and differences between nominal and temporal anaphora.

2 WHAT ARE THE ANAPHORS IN THE TEMPORAL DOMAIN?

- In the nominal domain we have lots of anaphors, pronouns, definite descriptions, certain types of NP ellipsis, etc.
- We will say that the only temporal entity that is an anaphor is the RT.
- In the following example, the ET of the second sentence is not anaphorically linked to the first clause, but the RT is. The past perfect then forces the ET to be located at some earlier time.

- (2) a. John went to the hospital.
 b. He had twisted his ankle on a patch of ice.

- **Can we think of some other temporal anaphors? Why does the nominal domain have more than the temporal domain?**
- Now that we know which entity will act as our temporal anaphor, we can specify a function from a clause, the event it will be linked anaphorically to, and a RT, to the event described by the clause.

$$(3) \quad \beta(C_b, E_a, RT_b) = E_b$$

- By spelling out our function clearly, we can immediately see a difference in the temporal domain. Ignoring the bridging cases, we usually think out of anaphor denoting the same entity as the NP it is anaphoric to. In the temporal domain, the entities related are of a completely different sort than the anaphor itself.
- Moreover, the two events related across discourse are never going to be the same. In a sense, we are always bridging we when resolve temporal anaphora.
- **But can we even call this bridging? Does the analogy hold? If not, is our event ontology fundamentally different from our nominal ontology with respect to anaphora resolution?**
- Our function β is just a template. What we really have are three functions that tell us which subpart of our structured event the RT is anaphoric to.

1. β_0

- (4) a. John played the piano.
 b. Mary played the kazoo.

2. β_{prep}

- (5) a. John bought Mary some flowers.
- b. He picked out three red roses, two white ones, and one pink one.

3. β_{conseq}

- (6) a. John went into the florist shop.
- b. He picked out three red roses, two white ones, and one pale pink.

- Notice, though, other factors can come into play to create similar structures with different different anaphoric functions. In the following example, the past perfect locates the antecedent event in the consequence phase of the anaphoric event. This is the reflection of events ordered by β_{conseq} .

- (7) a. John went to the hospital
- b. He had twisted his ankle on a patch of ice.

- To distinguish these anaphoric relations, we need to consider temporal focus (TF).

3 TEMPORAL FOCUS

- We know that the focus structure of the discourse constrains where pronouns are used and how people resolve potentially ambiguous pronoun usage.
- Notice that we need something similar for the temporal domain. We seem to be able to track topic times and temporarily store them while we make diversions.

- (8) a. I was at Mary's house yesterday. **TF**₁
- b. We talked about her sister Jane. **TF**_{1'}
- c. She spent five weeks in Alaska with two friends. **TF**₂
- d. Together, they climbed Mt. McKinley. **TF**_{2'}
- e. Mary asked whether I would want to go to Alaska some time. **TF**_{1''}

- Let's now rewrite our beta function to consider the temporal focus structure.

(9) $\beta(C_b, TF, RT_b)$

- Now we don't specify which event a following RT is anaphoric to, we assume there is always a most salient TF.
- Our functions give us rules for how the TF changes in discourse.

1. B_{prep} : RT's link to the preparatory phase of the TF locates E_b there, shifting the TF backward.

2. B_{conseq} : RT's link to the consequent phase of the TF locates event E_b there, shifting the TF forward.

- (10)
 - a. John went into the florist shop.
 - b. He picked out three red roses, two white ones, and one pale pink.

3. B_0 : The TF stays where it is, independent of whether $ET = RT$ or $ET < RT$ (in the case of the perfect).

- (11)
 - a. John went into the florist shop.
 - b. He had promised Mary some flowers.
 - c. He picked out three red roses, two white ones, and one pale pink.

- Supposedly the TF remains in place when we process the past perfect example. What happens when we continue as follows?

- (12)
 - a. John went to the hospital
 - b. He had twisted his ankle on a patch of ice.
 - c. He didn't think he broke it, but his mom made him call an ambulance.
 - d. The doctors said that he had in fact broken it.

- **It looks like we can continue on a TF linked to the ET introduced by the past perfect. Maybe the rule for B_0 is a defeasible inference that can be retracted if we continue in such a way that shows we are actually moving to an embedded discourse. Let's consider these issues in the next section.**

4 OPERATIONS ON GROSS TEMPORAL STRUCTURE

- Following is another example illustrating moving to an embedded discourse segment.

- (13)
 - a. John went into the florist shop. TF_1
 - b. He had promised Mary some flowers. TF_2
 - c. She said she wouldn't forgive him if he forgot. $TF_{2'}$
 - d. So he picked out three red roses, two white ones, and one pale pink. $TF_{1'}$

- The claim is that we restructure the temporal focus structure when we see that the third sentence is most plausibly interpreted as linked a new TF introduced in the second sentence.
- **What do hearers base their inferences about gross temporal structure on?**
- We can use the lexical semantics of predicates.

- It looks like *tell* can single that following material is embedded indirect speech about a previous event.

- (14)
- I was at Mary's house yesterday. **TF₁**
 - We talked about her sister Jane. **TF_{1'}**
 - She spent five weeks in Alaska with two friends. **TF₂**
 - Together, they climbed Mt. McKinley. **TF_{2'}**
 - Mary asked whether I would want to go to Alaska some time. **TF_{1''}**

- Similarly, deverbal nouns and nouns like *trip* can signal embedded narratives about the conceptual subparts of the noun, which is given to us by our ontology.
- We can also use tense to decide whether we move to an embedded discourse. In the following case, it looks like we never abandon **TF₁**.

- (15)
- I was at Mary's house yesterday. **TF₁**
 - She told me about her trip to Alaska. **TF_{1'}**
 - She had spent five weeks above the Arctic Circle with two friends. **TF_{1''}**
 - The three of them had climbed Mt. McKinley. **TF_{1'''}**
 - She said the next year they would go for Aconcagua. **TF_{1''''}**

- Webber leaves out the test showing that this is in fact what is going on. Notice that when we have embedded discourses, the new TF moves throughout the embedded discourse.

- (16)
- I was at Mary's house yesterday. **TF₁**
 - We talked about her sister Jane. **TF_{1'}**
 - She spent five weeks in Alaska with two friends. **TF₂**
 - They went to Mt. McKinley park. **TF_{2'}**
 - They made an attempt on the summit, but were turned away by a storm. **TF_{2''}**
 - The rest of the trip was good though. **TF_{2'''}**
 - Mary asked whether I would want to go to Alaska some time. **TF_{1''}**

- This is not the case when we have the past perfect. It is actually quite strange.

- (17)
- I was at Mary's house yesterday.
 - We talked about her trip to Alaska.
 - She had spent five weeks above the Arctic Circle with two friends.
 - #They had gone to Mt. McKinley park.
 - #They had made an attempt on the summit, but were turned away by a storm.
 - #The rest of the trip had been good though.
 - Mary asked whether I would want to go to Alaska some time.

- This makes sense if we don't get a new TF that we can track through the embedded discourse when we use the past perfect.
 - **Can nominal focus structure affect inferences to embedded discourses? Maybe when we make the nominal focus an entity that is not a participant in the main event structure, we are prompted to move to an embedded discourse.**
 - The effect can go the other way. That is, the ontology of the event picked out by the TF can license bridging.
- (18) a. John bought a television.
 b. Although he had intended to buy a 13", the salesman convinced him to buy a 25".

5 CONCLUSIONS

- We can capture the intuition that tense is anaphoric if we allow the reference time to act as the anaphoric link between events.
- Just like entities in the nominal domain have structure, events have structure as well, and the reference time of an event can be located in the preparatory, culmination, or consequence phase a previous event.
- If we impose a focus structure on set of temporal discourse entities, we can track which events the reference time will be anaphoric to. Gross changes in temporal structure can be explained by allowing multiple temporal focus structures that can be stored in a stack.