1 Preliminary thoughts: Narrative discourse

Narrative discourse is appealing because it constitutes "an author's invitation to the readers to a mutual imagining, to delight and instruct, by the creation of a possible world and possible characters striving towards goals, told in a way that directly reflects our own experience as we plan our way towards our goals in a world that denies us so much of what we desire" (Hobbs 1990, 40). It should come as no surprise that there are many lenses through which one can study a topic so rich. This monograph investigates the *temporal interpretation* of narrative discourse through the lens of a *formal semanticist*. The best way that I know how to begin is to provide a case study that motivates what I take to be the core phenomena: *prominence*, *coherence* and, crucially, how the interaction of these two phenomena factors in the semantic analysis of linguistic expressions.

Chapter 2 is a case study that builds on my collaborative research with Una Stojnić (Altshuler and Stojnić 2015a,b). It investigates the meaning of the adverb 'now' and its relation to the meaning of tense. Along the way, we illustrate how *prominence* is influenced by principles of *coherence*. This illustration relies on an ontological distinction between *events*, *states* and *times*, which is motivated by anaphoric constraints imposed by 'now'.

Chapter 3 provides a formally explicit characterization of two coherence principles, NARRATION and RESULT, which not only play a key role in our analysis of 'now', but they are also the backbone of temporal anaphora and narrative progression. Building on my collaborative research with Károly Varasdi (Altshuler and Varasdi 2015), Chapter 3 proposes a new method for testing the definitional adequacy of these discourse relations, namely by an *abductive argument*. This contribution opens a new way of thinking about how eventive and stative descriptions contribute to the perceived narrative progression in a discourse.

Chapter 4 provides a formally explicit characterization of tense by considering its interpretation in complements of propositional attitudes. In this way, we build on our informal analysis of tense in Chapter 2, employing the tools and insight developed in my collaborative research with Roger Schwarzschild (Altshuler and Schwarzschild 2012, 2013) and Corien Bary (Bary and Altshuler 2014). In addition, based on my collaborative research with Valentine Hacquard, Thomas Roberts and Aaron White (Altshuler et al. 2015), Chapter 4 provides a corpus study that provides a glimpse of how tense semantics interacts with Gricean principles and parentheticality.

Chapter 5 explores some cross-linguistic predictions of the analysis proposed in Chapter 4 and recasts our analysis in light of previous work on embedded tense, focusing particularly on the *Sequence of Tense* phenomenon and the *Upper Limit Constraint*.

Finally, Chapter 6 synthesizes the main claims of the monograph by providing a hypothesis about how tense meanings compose with meanings of temporal adverbs

and verb phrases. I then briefly explore some implications of the hypothesis by looking at the semantics of viewpoint aspect.

Questions raised by 'now'

At the heart of the case study in Chapter 2 is Hans Kamp's celebrated example noted in the preface:

(1)   I learned last week that there would now be an earthquake. (Kamp 1971, 229)

Notice that the earthquake is understood to be temporally located with respect to the utterance time even though there is no present tense in the sentence. Moreover, (1) is truth-conditionally distinct from its counterpart lacking 'now'. That counterpart is intuitively true as long as the earthquake occurred after the learning, including before/after the utterance of (2):

(2)   I learned last week that there would be an earthquake.

When we look at the broader discourse context, we see that our intuitions about (1) change:

(3)   Victoria began to look nervous, thought Jenya. She was shaking and paced back and forth. Poor thing! **She learned last week that there would now be an earthquake**.

Intuitively, the truth of (3) requires the earthquake to take place in the past and not at the time (3) was uttered. Why should this be? What is it about the additional bit of discourse in (3) that changes the referent of 'now'? And what exactly *is* the referent of 'now'?

To see the complexity of these questions, consider the data below:

(4)   Look at the pies below. How many $\frac{1}{6}^{th}$ slices fit into a $\frac{1}{2}$ slice? [Picture of pies] Now you can see that $\frac{1}{2}$ divided by $\frac{1}{6}$ really is 3! (Hunter 2012)

(5)   Shawn is just an angel. Now that brother of hers, he's something else entirely. (Hunter 2012)

What is the referent of 'now' in these discourses? And how does this use of 'now' differ from the other usages?

In addition to answering these questions, an analysis of 'now' should explain the fact that the use of 'now' often leads to infelicity:

(6)   #I hit him because he now hit me. (Hunter 2012, 15)

(7)   ??Bill had come home at seven. Now he wrote a letter. (Kamp and Reyle 1993, 596)

(8)   #Whenever I'm in Hadley, I'm happy now.

What is wrong with 'now' in (6)-(8)? That is, why does 'now' fail to refer to some *prominent* entity in these discourses but succeeds in (1), (3), (4) and (5)?

Main claims of Chapter 2

We argue that 'now' refers to the most prominent state – not time! – which holds throughout the time encoded by the tense. But not any prominent state will do. To satisfy the anaphoric constraints imposed by 'now', the state must be understood as resulting from a prominent event. In effect, our proposed contribution of 'now' can be paraphrased as follows: *with this having happened*.

   Our proposed analysis has two important consequences for semantic theorizing: (i) states are not reducible to mere temporal intervals and (ii) anaphora resolution is sensitive to the distinction between events, states and times. For example, we claim that the discourses below, which are 'now'-less counterparts of (3), (4) and (6) respectively,

(9)   Victoria began to look nervous, thought Jenya. She was shaking and paced back and forth. Poor thing! She learned last week that there would be an earthquake.

(10)   Look at the pies below. How many $\frac{1}{6}^{th}$ slices fit into a $\frac{1}{2}$ slice? [Picture of pies] You can see that $\frac{1}{2}$ divided by $\frac{1}{6}$ really is 3!

(11)   I hit him because he hit me.

involve *time anaphora*, while all discourses involving 'now' (e.g. (1), (3), (4) and (5)) involve *event anaphora*, *state anaphora* and *time anaphora*.

   At the end of Chapter 2, we explore a way of retaining the classic view that 'now' is a pure indexical, i.e. the interpretation of 'now' is determined fully as a function of context (Kaplan 1989 and Kamp 1971). To make such a story work, one needs a theory of how *eventualities* (events and states) interact with principles of discourse coherence. Observe that we infer in (11) that one hitting event is used to *explain* why another hitting event occurred and this is key to understanding why 'now' fails to refer in (6). We will argue that this observation is related to the following contrast from Hobbs (1979):

(12)   John took a train from Paris to Istanbul. He has family there.

(13)   #John took a train from Paris to Istanbul. He likes spinach.

There is a stark contrast between (12) and (13). While the former is a perfectly acceptable discourse, the latter sounds bad. Why is this? To answer this question, note that (12) does not merely list two random facts about John. Rather, a hearer normally understands (12) as conveying that John took a train from Paris to Istanbul because he has family there. Understanding that there is this explanatory connection between

these two pieces of discourse is necessary for fully understanding the speaker's contribution in (12). And by contrast, the failure to carry out the interpretive task by establishing a coherent connection between the two sentences in (13) results in infelicity. The interlocutors are left with the feeling that they have not fully comprehended the contribution of the speaker (they are left searching for an explanatory connection – is Istanbul famous for its spinach? Or do they serve spinach on trains to Istanbul? Or does Paris have bad spinach?).

Discourse relations and pronoun resolution
Coherence theorists materialize these observations by positing *discourse relations* in the logical form of a given discourse. Discourse relations encode possible ways that ideas could be associated and according to which a discourse is organized, i.e., a discourse is coherent because it is organized by particular discourse relations. We assume that the associate principles underlying the establishment of discourse relations are psychological in nature:

(14)   It is tempting to speculate that these coherence relations are instantiations in discourse comprehension of more general principles of coherence that we apply in attempting to make sense out of the world we find ourselves in, principles that rest ultimately on some notion of cognitive economy. [...] Recognizing coherence relations may thus be just one way of using very general principles for simplifying our view of the world (Hobbs 1990, 10).[1]

Hobbs's insight has led to the hypothesis below, which has been the subject of investigation in several psycholinguistic studies.[2]

(15)   Coherence and anaphora:
        Establishing discourse relations and resolving the interpretation of an anaphoric expression are correlated and mutually constraining tasks.

This hypothesis has been motivated – for the most part – by looking at pronoun resolution. For example, the starting point of Kehler et al.'s (2008) research is a well-known claim that pronoun resolution involves (at least) two kinds of preferences: (i) parallel grammatical subjects and (ii) parallel thematic roles. Motivation for this claim comes (in part) from the contrasts such as the one in (16):

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1 For alternative views of discourse relations, see Longacre 1983, Mann and Thompson 1987, Martin 1992, Sanders et al. 1992 and references therein.
2 See, e.g. Wolf et al. 2004, Kertz and Elman 2006, Kehler et al. 2008, Rohde and Kehler 2008, Kaiser 2011, Rohde and Horton 2014.

(16) a. Bush narrowly defeated Kerry, and special interests promptly began lobbying him. [=Bush]
      b. Kerry was narrowly defeated by Bush, and special interests promptly began lobbying him [=Kerry].[3] (Kehler et al. 2008, 6)

According Kehler et al., the pronoun in (16-a) refers to Bush, while the pronoun in (16-b) refers to Kerry. Why should this be, given that (16-a)–(16-b) only differ in voice? The natural answer is that pronoun resolution involves a bias for parallel grammatical subjects.

Further evidence for this hypothesis comes from (17-a).

(17) a. John seized the comic from Bill. He_____.
      b. John passed the comic to Bill. He_____. (Kehler et al. 2008, 7)

Kehler et al. cite Stevenson et al. (1994) as reporting – based on experiments – that participants were considerably more likely to complete (17-a) in a way that requires 'he' to refer to John rather than Bill. Notice that 'John' is both the subject and the Goal of the sentence. With this in mind, compare (17-a) with (17-b), where 'John' is a subject that fills the Source role and 'Bill' is a non-subject that fills the Goal role. Interestingly, Stevenson et al. report that "Goal continuations, that is those which correspond to a Goal interpretation for the pronoun, occurred about as frequently as Source continuations (a 49-51% split) (cited in Kehler et al. 2008, 23)."

One possible hypothesis that explains these results is that there is both a subject assignment strategy and a Goal preference at work, agreeing on a referent in (17-a), but disagreeing on a referent in (17-b). Kehler et al., however, pursue the hypothesis in (15) above. In particular, they pursue the idea that the discourse relation OCCASION, defined below and discussed at length in Chapter 3, gives rise to a Goal preference.

Definition 1 (OCCASION). Given two discourse units σ_1, σ_2, OCCASION(σ_1, σ_2) holds iff
  1. A change of state can be inferred from the assertion of σ_1, whose final state can be inferred from σ_2.
  2. A change of state can be inferred from the assertion of σ_2, whose initial state can be inferred from σ_1 (Kehler (2002, 22), citing Hobbs (1985, 10)).

To test this hypothesis, Kehler et al. ran an experiment in which passages such as (18-a) below (resembling (17-b)) were compared to the minimal pair in (18-b), differing solely in that the verb in the initial sentence is in the progressive.

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3 As noted by Kehler et al. (2008), the preference for Kerry "may rely to some degree on the hearer knowing that he is a US Senator, and thus, like Bush, is able to be lobbied."

(18) a. John handed a book to Bill. He_____.
      b. John was handing a book to Bill. He_____. (Kehler et al. 2008, 24)

Notice that (18-a) and (18-b) have the same thematic structure. However, they crucially differ in that only (18-a) entails a change of state: Bill went from not having a book in his possession, to having a book in his possession. Therefore, while "thematic role preference predicts a similar distribution of Source and Goal interpretations between the two conditions...the event-structure hypothesis predicts a greater percentage of Source interpretations in [(18-b)] than in [(18-a)] (ibid, 24)."

Leaving the experimental details aside (see, ibid, 24-25), the results indicate that pronoun interpretation is sensitive to aspect. Kehler et al. report that the progressive context yielded significantly more Source interpretations (70%) than the simple past context. They thus concluded that the "the Goal bias is at least in part an epiphenomenon of a bias towards focusing on the end state of the previous eventuality" (ibid, 25). In turn, they argued that the end-state bias is an epiphenomenon of establishing OCCASION. This argument was supported by corpus research showing that discourses which have an unambiguous Goal interpretation are annotated as exemplifying OCCASION significantly more often than any other relation.

In sum, Kehler et al. provide experimental evidence which establish that event-structure biases are involved in the interpretation of pronouns. Crucially, these biases are argued to be an epiphenomenon of establishing OCCASION, thereby supporting (15).

Temporal anaphora
In this monograph, we explore (15) from the standpoint of *temporal anaphora*, a notion that was coined by Partee (1984) to characterize the parallels between tenses and pronouns (Partee 1973, Kratzer 1998). Temporal anaphora has to do with the resolution of tense, a phenomenon that is correlated with the establishment of discourse relations much in the same way as pronoun resolution (Webber 1988). To see this, compare the following two discourses:

(19) a. Phil tickled Stanley.
      b. Liz poked him. (Smyth 1994)

(20) a. Stanley screamed with pain in his eyes.
      b. Liz poked him.

One can understand (19) as comparing and contrasting two events that happened to Stanley (that is, as harboring the discourse relation of PARALLEL), or as describing what happened as a result of the event described by the first sentence (i.e. as harboring the discourse relation of RESULT). Crucially though, the choice of the discourse relation is correlated with the resolution of the pronoun 'him'. In particular, Kehler

et al. (2008) report that if (19) is understood as harboring PARALLEL, 'him' is interpreted as referring to Stanley, and if it is understood as harboring RESULT, 'him' refers to Phil.

Likewise, the choice of the discourse relation is correlated with the resolution of the past tense in (20-b). In particular, if (20) is understood as harboring EXPLANATION, the prominent time in (20-b) is understood to be *prior* to Stanley's scream. In other words, on the EXPLANATION reading, (20-b) asserts what led Stanley to scream. If, however, (20) is understood as harboring RESULT, then the prominent time in (20-b) is understood to be *after* Stanley's scream. In other words, on the RESULT reading, (20-b) asserts how Liz responded to Stanley's scream.

Defining discourse relations

We have been assuming thus far that there are distinct discourse relations and their difference is linguistically relevant. It is therefore surprising that few linguistic diagnostics have been provided to differentiate these relations. Moreover, discourse relations are rarely defined. Definition 1 of OCCASION is one notable exception. Instead, discourse relations are typically characterized in terms of their import. For example, consider the following characterization of two discourse relations which are related to OCCASION and which are often seen as the backbone of temporal anaphora:

(21)   Given two discourse units σ_1, σ_2, NARRATION(σ_1, σ_2) holds if the event described in σ_2 is a consequence of (but not strictly speaking caused by) the event described in σ_1 (Lascarides and Asher, 1993, 2).

(22)   Given two discourse units σ_1, σ_2, RESULT(σ_1, σ_2) holds if the event described in σ_1 caused the event or state described in σ_2 (Lascarides and Asher, 1993, 2).

These relations are characterized in terms of their causal import, with particular constraints on how events and states factor into the causal chain. How can we test whether these characterizations are correct? And, how can we identify which discourse relation holds when? Indeed, many semanticists are hesitant to incorporate discourse relations into their framework precisely because questions of this kind are so difficult to answer.

Main claims of Chapter 3

Chapter 3 of this monograph offers a novel method for testing the definitional adequacy of NARRATION and RESULT, namely via an *abductive argument*. This argument is fueled by the following two hypotheses which we aim to motivate:

(23)   NARRATION and RESULT are defined in terms of enthymematic entailment, with reference to eventualities.

(24)   RESULT asymmetrically entails NARRATION.

Given (23) and (24), we derive general constraints pertaining to possible discourse units – defined in terms of the event components described in Definition 1 above. We verify the plausibility of our derived discourse units by showing that they correspond to well attested English sentences. Since the discourse units are plausible, we therefore conclude that we have reached definitional adequacy of NARRATION and RESULT.

   Chapter 3, then, transitions into a series of appendices. Appendix A outlines possible avenues to pursue in the future. In particular, we ask what sort of concatenations of discourse units we predict to give rise to RESULT and NARRATION. We explore one prediction in particular, namely that eventive, but not stative descriptions move the narrative time forward – a view that goes back to Jespersen (1924), but is considered to be quite controversial. Appendix B provides some derivations that are implicit in Chapter 3.

Aim of Part II

This, then, is the outline for Part I of the monograph. Part II brings us back the analysis of 'now' proposed in Chapter 2. Recall that the hypothesis we aim to defend is that 'now' refers to the most prominent state (resulting from a prominent event) which holds throughout the time encoded by the tense. But we have said very little about tense so far! This is the aim of Part II.

Cessation

An observation that fuels the proposed analysis of tense is that some discourses lead to an inference that no state of the kind described currently holds. For example, imagine you are at a bar and a man shows you a picture of a woman in her late 60s, proceeding to say:

(25)   a.   This is my mom.
        b.   She was Armenian.

You would likely infer that the speaker's mom is dead. This inference is called *Lifetime Effects* by Enç (1987). It is dependent on another inference, which we call *cessation*, namely that the mother is not Armenian at the time (25) was uttered, along with knowledge that people do not change ethnicities over a life time.

Main claims of Chapter 4

In Chapter 4, we claim that cessation (and the lack thereof) sometimes has to do with tense choice and we explore this claim in detail, offering an analysis that treats the present and past tenses as being *scalar alternatives*. This view is motivated by adopt-

ing the hypothesis in (26) which concerns stative predication and which itself is motivated by well-known philosophical problems concerning changes of state and first moments:

(26) The Temporal Profile of Statives:
For any tenseless stative clause ϕ, if a moment m is in $[\![\phi]\!]$, then there is a moment m' preceding m and a moment m'' following m such that m' and m'' are in $[\![\phi]\!]$.

Our analysis of tense is first tailored to matrix clauses, before being extended to complement clauses of propositional attitudes, where cessation also arises:

(27) We were at the party last night and got to discussing nationalities. John proclaimed proudly that his mother is American and **his dad was Dutch**.

Analogous to (25), (27) exemplifies Lifetime Effects, i.e. that John's father is no longer alive. Moreover, as before, these effects begin with a chain of reasoning that starts with a cessation inference. From the past tense on 'was Dutch' we infer that John's father is no longer Dutch. Assuming that being Dutch is for life, we deduce that John's father must have died.

On our analysis, deriving cessation in (27) involves considering an alternative in which you have a present tense clausal complement of a past tensed attitude:

(28) We were at the party last night and got to discussing nationalities. John proclaimed proudly that his mother is American and **his dad is Dutch**.

Such a construction is known to give rise to the *double access* reading, which is quite tricky to analyze. Despite its complexity, it tells us a lot about the meaning of the present tense. In fact, much of Chapter 4 is devoted to this reading.[4] Based on this reading, we propose that the present tense in English involves universal quantification and is an amalgam of both a relative and an absolute present. Moreover, we claim that tense domain restriction is intensional (properties of times, not times themselves) and call this restriction: *Reference Time Concept*. The time described by a given Reference Time Concept corresponds to the prominent time established in the discourse context.

Main claims of Chapter 5
An important implication for our analysis of tense is the generalization below:

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[4] It is a golden nugget for a linguist working on tense in much the same way that negative polarity has proved to be a golden nugget for linguists working on negation and quantification.

(29) Cessation Generalization:
Cessation arises with PAST-ϕ when the Reference Time Concept does not – by itself – trigger a presupposition failure with PRES-ϕ.

In Chapter 5, we show how (29) may be correlated to what is often called a "simultaneous reading": the intuition that the time of the eventuality described in the embedded clause is simultaneous with the time of the attitude described in the matrix clause. For example, in (30) below, one has an intuition that the state of being Dutch is simultaneous with the time of the saying.

(30) I met a musician last night. He had a cool accent. He said **his father was Dutch** and that affected his speech.

This alleged reading is a challenge to the semantics of the past tense that we propose and often forms the basis for a distinct analysis that usually goes by the name "Sequence of Tense". We offer the conjecture below

(31) Simultaneity Conjecture:
It is the perception of the absence of a cessation implicature that is reported as 'simultaneity' for past tensed statives embedded under attitude predicates.

and show how it not only explains intuitions about English, but also about contrasting data in Russian and Hebrew, where the putative simultaneous reading does not arise with a past tense that is embedded under a propositional attitude. We end the chapter by discussing evidence for and against Sequence of Tense.

Main claims of Chapter 6
Finally, Chapter 6 considers two approaches to viewpoint aspect – that of Emmon Bach/Manfred Krifka (Bach 1986, Krifka 1992) and that of Wolfgang Klein (Klein 1994) – in light of a hypothesis about how meanings for temporal locating adverbs (proposed in Chapter 2) and tenses (proposed in Chapter 4 and Chapter 5) interact. I look at the empirical phenomena below to point out various consequences of adopting one approach to viewpoint aspect versus the other.

- aspectual stacking in English and Russian

- reference time fixing with temporal locating adverbs and the progressive aspect in English

- the imperfective paradox and non-culminating accomplishments in English, Hindi and other languages

The hope is that this discussion fuels future research on how tense, temporal locating adverbs and VPs interact with viewpoint aspect to mediate between events, states and times.