

## ‘Now’ with subordinate clauses \*

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**Abstract** We investigate a novel use of the English temporal modifier ‘now’, in which it combines with a subordinate clause. We argue for a univocal treatment of the expression, on which the subordinating use is taken as basic and the non-subordinating uses are derived. We start by surveying central features of the latter uses which have been discussed in previous work, before introducing key observations regarding the subordinating use of ‘now’ and its relation to deictic and anaphoric uses. All of these data, it is argued, can be accounted for on our proposed analysis. We conclude by comparing ‘now’ to a range of other expressions which exhibit similar behavior.

**Keywords:** indexicality, anaphora, subordinate clauses, temporal adverbs, temporal connectives, type shifting

### 1 Introduction

As demonstrated in [Kamp & Reyle 1993](#), ‘now’ exhibits both deictic and anaphoric uses. The deictic use is exemplified in (1a). In contrast to (1b), the presence of ‘now’ requires the reference time of the the clause in which it occurs to be identical to the speech time.

- (1) a. Two years ago I thought I would be happy now.  
b. Two years ago I thought I would be happy.

The anaphoric use of ‘now’ is exemplified in (2-3). In such cases, it occurs felicitously in past-tensed clauses (suggesting it does not require identification of reference time with speech time) and differs in its contribution across discourse environments (suggesting sensitivity to discourse antecedents).

- (2) a. Paul finished sautéing the onions. Now he stirred in the wine.  
b. Paul finished sautéing the onions and waited 5 minutes. Now he stirred in the wine.

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\* We owe thanks to audiences at ‘Topics in Semantics’, UMASS-Amherst; PLC41; SALT27; ‘Workshop on Semantics of Embedded Sentences’, NYU; ‘Subordinate Clauses in Generative Linguistics’, UCL, and ESSLLI17. Thanks also to the SALT reviewers for helpful comments.

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- (3) Within a couple of minutes a huge male tiger emerged from behind some rocks and bushes and lay down in a clearing close beside her. The tigress now got up again as if in a half daze, walked up to him, pushed against his shoulders and head and lay down right in front of him. (*Wild experiences*, P. Gupta)

Whereas the discourse in (2a) requires that the stirring event occurred after the end of the event of sautéing the onions, the discourse in (2b) requires that it occurred after the end of the the waiting event. Similarly, in (3), the event of the tigress getting up is required to follow the event of the male tiger lying down.

Kamp & Reyle (1993) argue that 'now' must co-occur with stative predicates (both on the deictic and anaphoric uses). This constraint is shown to be inadequate by the data in (2) and (3) (see Lee & Choi 2009 and Hunter 2010 for more discussion.) However, as shown later in this paper, 'now' does impose such aspectual restrictions in subordinate clause constructions. With respect to the uses of 'now' discussed thus far, it is the anaphoric component which can lead to infelicity (Altshuler 2009; Altshuler & Stojnić 2015). This is demonstrated below:

- (4) a. Yvonne arrived home. Now she made herself a cup of coffee.  
b. Yvonne was at home. ??Now she made herself a cup of coffee.

Whereas in (4a) 'now' functions anaphorically to fix the start of the coffee making event after the arrival event, its occurrence in the discourse environment in (4b) is infelicitous. Relatedly, Hunter (2012) observes that in (5) below, 'now' cannot function to anaphorically fix the start of the state of being happy during the summer of '82.

- (5) I like to think back to the summer of '82. ??I was so happy now.

Hunter (2012: 15) further notes the contrast between (6a) and (6b), which differ solely in the presence of 'now' in the subordinate clause. Whereas the former is coherent, the latter is marked. When we remove the subordination, as in (6c), the resulting discourse is acceptable (though the order of the eventualities described in (6a) is reversed, a point we come back to later in the paper).

- (6) a. I hit him because he hit me.  
b. ??I hit him because now he hit me.  
c. I hit him. Now he hit me.

Finally, Altshuler (2016) observes that 'now' can be used felicitously with the future auxiliary 'will' in discourse initial environments, in contrast to past tensed counterparts. For example, 'now' in (7a) functions to restrict the time of the event

described in the clause to an interval immediately following the speech time. Without ‘now’, as in (7b), the time of the showing event is no longer restricted in this way. Moreover, the past counterpart of (7a) in (8a) is odd; it cannot mean that the showing took place during an interval immediately before the speech time. Instead, this reading is expressed with ‘just’ as in (8b).

- (7) a. I will now show you to your room.  
 b. I will show you to your room.
- (8) a. ??I now showed you to your room.  
 b. I just (now) showed you to your room.

Having outlined what we take to be the core uses of ‘now’, we now proceed to consider a novel usage. In the next section, we consider data in which ‘now’ combines with a subordinate clause. Subsequently, in §3, we provide an analysis of this subordinating use. §4 argues that if the subordinating use is taken as basic, (i.) it can serve as the basis of a derivative analysis of the non-subordinating uses of ‘now’, and (ii.) this analysis can account for core data considered in this section. §5 compares ‘now’ to other subordinating expressions which function as temporal modifiers and argues that this comparison provides further motivation for the analysis. §6 concludes with a summary of the analysis and some outstanding questions.

## 2 Novel data

In (9-10), ‘now’ combines with a subordinate clause, which can occur pre-posed (e.g. (9a) and (10)) or post-posed (e.g. (9b)):

- (9) a. Now that Liza had reached the ridge, she could see the summit above her.  
 b. Liza could see the summit above her, now that she had reached the ridge.
- (10) Now that he had finished sautéing the onions, Paul stirred in the wine.

In sentences involving the subordinating use of ‘now’, the onset time of the eventuality in the main clause is constrained relative to the eventuality introduced in the subordinate clause. For example, (9) requires the state of being able to see the summit to begin after the completion of the event of reaching the ridge. Similarly, (10) requires the stirring event to begin after the completion of the sautéing event.

As such, subordinating uses of ‘now’ appear closely related to the corresponding discourses in which the subordinate clause occurs as a distinct sentence and the time of the eventuality in the main clause is instead fixed anaphorically. Thus, (11-12) are intuitively similar in meaning to (9-10), respectively, imposing identical constraints on the time of the eventuality in the second sentence:

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(11) Liza had reached the ridge. Now she could see the summit above her.

(12) Paul finished sautéing the onions. Now he stirred in the wine.

In §4, we argue for a univocal treatment of 'now', on which the data above are given a unified analysis, and which is motivated, at least in part, by the need to account for the similarity between, e.g., (9-10)/(11-12). Nevertheless, subordinating uses of 'now' do exhibit a number of distinctive features not found in deictic and anaphoric constructions and this too fuels our proposed analysis.

*i. Non-Indexicality.*

In deictic (e.g., (1a) and (7a)) and anaphoric (e.g., (2-3) and (11-12)) uses, 'now' functions *indexically*. Its effect on the reference time of the clause with which it combines is dependent upon features of the context in which it occurs - whether linguistic features (as in the latter case) or non-linguistic features (as in the former).

In contrast, in (9-10) 'now' functions *non-indexically*. The constraint on the reference time of the main clause is determined entirely by the material introduced in its subordinate clause and is not sensitive to context, whether linguistic or non-linguistic. Thus, in subordinating uses, the effect of 'now' is dependent on context only insofar as the contribution of tense in its subordinate complement is itself dependent. We will refer to deictic and anaphoric uses of 'now' collectively as *indexical uses*, with uses in which it takes a subordinate clause being referred to as *non-indexical uses*.

*ii. Not-At-Issue Content.*

The subordinate clause position of 'now' appears not-at-issue and projects from embedded contexts.

- (13) a. It is not the case that Jean-Paul will be any happier now that he's rich.  
b. Will Jean-Paul be any happier, now that he's rich?  
c. Maybe now that Jean-Paul is rich, he will be happier.  
d. Marie wonders whether Jean-Paul will be happier, now that he's rich.

Each of (13a-d) entails that Jean-Paul is rich, with (13d) carrying the additional entailment that Marie believes that Jean-Paul is rich. Similarly, the subordinate clause position cannot be targeted by 'yes'/'no' answers to polar questions (14), or by propositional anaphors, such as 'so' (15).

- (14) Q: Will Jean-Paul be any happier, now that he's rich?  
A: No, he won't be any happier.  
A': ??No, he's not rich.

- (15) Now that Klaus was on the beach, he put on his sunglasses.  
 i. So, if Mary was wearing sunglasses, they were both wearing sunglasses.  
 i'. ??So, if Mary was at the beach, they were both at the beach.

*iii. Selectional Properties: Eventive VPs.*

The subordinate position of non-indexical uses of ‘now’ exhibits aspectual sensitivity. Native speakers report a contrast in felicity between (16a) and (16b):

- (16) a. Now that Helene had finished her coffee, she was ready to leave the house.  
 b. ??Now that Helene finished her coffee, she was ready to leave the house.

Whereas the eventive VP in the simple past is marked, it improves considerably with the perfect. Note, however, that the corresponding anaphoric use, in which the eventive VP under simple past occurs in a distinct discourse unit, is judged felicitous:

- (17) Helene finished her coffee. Now she was ready to leave the house.

As such, the selection against eventive VPs appears limited to non-indexical constructions.

*iv. Selectional Properties: Stative VPs.*

Comparison with constructions in which the subordinate clause contains a stative VP under simple past provides evidence that the infelicity of sentences such as (16b) is not attributable to the tense of the clause.

- (18) Now that Uri enjoyed his job, he looked forward to going to work.

Like (16b), in (18) ‘now’ combines with a subordinate clause with simple past tense, yet the resulting sentence is felicitous. The relevant difference appears to be the use of a stative (rather than eventive) VP. As such, on the assumption that the result of embedding a VP under perfect is state-denoting<sup>1</sup>, the contrast between (16a) and (16b) is plausibly best explained as arising from a selectional preference for stative over eventive clauses, rather than being associated with tense.

Note that (18) carries a change of state entailment.<sup>2</sup> That is, in addition to requiring that Uri’s state of looking forward to going to work began during the state of enjoying his job, it implies that the latter state had not always obtained (i.e., that at some prior time, Uri did not enjoy his job). This observation is borne out in non-indexical constructions such as (19):

<sup>1</sup> See, e.g. Moens & Steedman 1988; Parsons 1990; Kamp & Reyle 1993; Higginbotham 2008; Kamp, Reyle & Rossdeutscher 2016; Ramchand 2017

<sup>2</sup> That ‘now’ leads to a change of state inference is discussed by Recanati (2004) and Hunter (2010). These authors do not, however, discuss ‘now’ with subordinate clauses.

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(19) ??Now that helium is lighter than air, the balloon will start to rise.

In (19), the subordinate clause introduces a state lacking an onset time, which is incompatible with the change of state entailment, yielding infelicity.

Note also - and, we argue in §4, relatedly - that the corresponding anaphoric use is marked. Unlike (16b), which exhibited improvement when the subordinate clause occurred as a distinct discourse unit, (20) is notably worse than (18):

(20) Uri enjoyed his job. ??Now he looked forward to going to work.

### 3 Analysis: Non-Indexical Uses

Assuming an event-theoretic framework, clauses (prior to existential closure) denote descriptors - properties of eventualities. Accordingly, as shown below in (21), ‘now’ takes two descriptors as arguments.  $s, s' \dots e, e' \dots$  and  $v, v' \dots$  are variables over states, events, and eventualities (i.e., states and events), respectively;  $\tau$  is a function from eventualities to their run times;  $\text{ON}^3$  is a function from eventualities to their onset times;  $\text{FIN}$  is a function from events to their final states.

(21)  $\llbracket \text{now} \rrbracket = \lambda P : \text{FIN}(e) = s \wedge P(s). \lambda Q. \exists v : \text{ON}(v) \in \tau(s) \wedge Q(v).$

According to (21), ‘now’ lexically contributes variables for a state  $s$ , event  $e$  and eventuality  $v$ . The former two are assumed to undergo existential closure at sentential level, whereas the latter is bound by a quantifier inside the main clause<sup>4</sup>. The not-at-issue content contribution of ‘now’ is encoded as a domain restriction. It requires that there exist some state,  $s$ , and event,  $e$ , such that:

- $s$  is the final state of  $e$
- $s$  satisfies  $P$

The at-issue content contribution imposes constraints on the eventuality  $v$ . It requires that:

- the onset of  $v$  occurs within the run-time of  $s$
- $v$  satisfies  $Q$

<sup>3</sup>  $\text{ON}(v) = t \in \tau(v). \neg \exists t' \in \tau(v) : t' < t.$ , where  $t, t' \dots$  are variables over times,

<sup>4</sup> Sentential level existential closure will, in a complete analysis, require some mechanism for achieving an inverse scope reading between negation in the subordinate clause and the quantifiers binding the event- and state-variables. This can be achieved in the manner explored by Champollion (2015) or in a continuation-based framework, e.g. Barker & Shan 2014.

Stated informally,  $\text{Now}(\phi)(\psi)$  is defined iff there is some  $\phi$ -state which is the final state of some event. It is true iff there is some  $\psi$ -eventuality, the onset of which occurs within the run-time of that state. For example, (9), repeated below, is defined iff there is a state of Liza having reached the ridge, and that state is the final state of some event (i.e., an event of reaching the ridge). It is true if there is a state of her being able to see the summit, and that state has its onset during the state of having reached the ridge.

- (22) a. Now that Liza had reached the ridge, she could see the summit above her.  
b. Liza could see the summit above her, now that she had reached the ridge.

The analysis in (21) accounts for each of the observations in the previous section. First, under the assumption that when it takes a subordinate clause all variables introduced by ‘now’ undergo existential closure, such constructions are predicted to be insensitive to contextual factors (see §2.i).<sup>5</sup>

Second, the domain restriction on the denotation of ‘now’ encodes the not-issue-content of non-indexical uses of ‘now’ (see §2.ii) in the form of a presupposition. Thus, e.g., (22) above presupposes that there exists a state prior to the speech time of Liza having reached the ridge and that that state is the final state of some event. As a domain restriction, this will project out of embedded contexts, as in (13.a-d), repeated below.

- (23) a. It is not the case that Jean-Paul will be any happier now that he’s rich.  
b. Will Jean-Paul be any happier, now that he’s rich?  
c. Maybe now that Jean-Paul is rich, he will be happier.  
d. Marie wonders whether Jean-Paul will be happier, now that he’s rich.

Third, since the denotation of the subordinate clause is applied to a state-variable in the domain restriction, it is predicted that  $\text{Now}(\phi)(\psi)$  will be well-formed only when  $\phi$  is a stative clause. Under the assumption that the perfect is a stativizer, this explains the contrast between (16a) and (16b), repeated below, that was discussed in §2.iii.

- (24) a. Now that Helene had finished her coffee, she was ready to leave the house.  
b. ??Now that Helene finished her coffee, she was ready to leave the house.

Moreover, we correctly predict that (18), repeated below and discussed in §2.iv, is acceptable, due to ‘enjoy’ being stative.

- (25) Now that Uri enjoyed his job, he looked forward to going to work.

<sup>5</sup> We assume here that context sensitivity is modeled as sensitivity to the contextually supplied assignment function.

Finally, the presupposition that the state satisfying the subordinate clause is the final state of some event predicts the change-of-state entailment. For example, in (25), we correctly predict there to be an inference that Uri previously did not enjoy his job, i.e., there was some event that led to the state of Uri enjoying his job. Moreover, we correctly predict the infelicity of examples such as (19), repeated below, in which no state satisfying the subordinate clause functions as the final state of an event.

(26) ??Now that helium is lighter than air, the balloon will start to rise.

#### 4 Indexical Uses of 'Now'

A unified treatment of indexical and non-indexical uses of 'now' is motivated by at least two factors. First, the assumption that 'now' is univocal across the two types of constructions can help to account for the apparently close relation between the meanings of sentences such as (9-10) and discourses such as (11-12) respectively. These data are repeated below.

(27) Now that Liza had reached the ridge, she could see the summit above her.

(28) Now that he had finished sautéing the onions, Paul stirred in the wine.

(29) Liza had reached the ridge. Now she could see the summit above her.

(30) Paul finished sautéing the onions. Now he stirred in the wine.

Notice that in (27) and (29), 'now' functions to constrain the onset time of the state of Liza being able to see the summit relative to the final state of some event - namely, the event of reaching the ridge. Similarly, in (28) and (30), 'now' functions to constrain the onset time of stirring event relative to the final state of some event - namely, the event of finishing sautéing the onions. In (27) and (28), this is contributed lexically by the subordinate clause, whereas in (29) and (30) it is supplied anaphorically.

The second factor for having a unified treatment of indexical and non-indexical uses of 'now' is that these two uses are realized by the same expression in every language that we know of that has such usages. This is the case despite the fact that many languages have distinct expressions that translate as 'now'.<sup>6</sup> Put differently, while languages differ as to what sorts of contexts license a particular expression that translates as 'now', we know of no language that has a particular expression reserved solely for the indexical but not the non-indexical usage of 'now'.<sup>7</sup>

6 For discussion of how 'now' is expressed in other languages, see e.g. [Kamp & Rohrer \(1983\)](#) for French, [Mel'chuk \(1985\)](#) for Russian, [Lee & Choi \(2009\)](#) for Korean and [Ritz & Schultze-Berndt \(2015\)](#) on Jaminjung.

7 Of course, even if there were a language that lexicalizes the indexical non-indexical distinction of 'now', this would not be an argument against a uniform treatment of 'now' in English.



In this section we propose a unified treatment on which the non-indexical use is taken as basic, and the indexical uses are derived via the application of a type-shifting morpheme. In §5, we consider a body of comparative data which motivate this approach. However, it also draws support from properties of the generalised types of the two constructions.

As noted above, within an event-theoretic framework, the denotation of a clause prior to existential closure is descriptor, with type  $\langle \alpha, t \rangle$  - i.e., it has the abstract type of a property. In non-indexical uses, in which it takes two clausal arguments, ‘now’ has the type  $\langle \langle \alpha, t \rangle, \langle \langle \alpha, t \rangle, t \rangle \rangle$ , - i.e., the abstract type of a determiner. Conversely, in indexical uses, in which it takes a single complement, it has the type  $\langle \langle \alpha, t \rangle, t \rangle$  - i.e., the abstract type of a generalised quantifier.

We note that there exists a general type-shifting operation, specified below in (31), from entities of the former type to entities of the latter type. This is the operation which transforms a binary relation between properties into a monadic property of properties by applying the former to the trivial property of entities of the appropriate type.

$$(31) \quad \llbracket \text{DET} \rightarrow \text{GQ} \rrbracket = \lambda \Pi_{\langle \langle \alpha, t \rangle, \langle \langle \alpha, t \rangle, t \rangle \rangle} \lambda P_{\langle \alpha, t \rangle} . \Pi(\lambda x_{\alpha} . x = x)(P)$$

For example, application of the  $\text{DET} \rightarrow \text{GQ}$  type-shifter to the denotation of the determiner ‘every’ will derive the denotation of the GQ ‘everyone’ (and likewise, for, e.g., ‘no’  $\rightarrow$  ‘no-one’, ‘some’  $\rightarrow$  ‘someone’).

The denotation for the indexical use of ‘now’ can be derived via an application of the  $\text{DET} \rightarrow \text{GQ}$  type-shifter to the meaning given in (21), repeated below.

$$(32) \quad \llbracket \text{now} \rrbracket = \lambda P : \text{FIN}(e) = s \wedge P(s) . \lambda Q . \exists v : \text{ON}(v) \in \tau(s) \wedge Q(v).$$

We propose that, in indexical constructions, ‘now’ combines with a null morpheme,  $\emptyset_{\text{DET} \rightarrow \text{GQ}}$ , which denotes this type-shifter, yielding (33):

$$(33) \quad \llbracket \emptyset_{\text{DET} \rightarrow \text{GQ}}(\text{now}) \rrbracket = \lambda Q : \text{FIN}(e) = s . \exists v : \text{ON}(v) \in \tau(s) \wedge Q(v).$$

We assume that the state-variable,  $s$ , undergoes existential closure at sentential level, but that the event-variable,  $e$ , remains free, with its value being contributed by context via the contextually supplied assignment function, i.e.,  $e$  picks out a salient event in discourse.<sup>8</sup> Thus,  $\llbracket \emptyset_{\text{DET} \rightarrow \text{GQ}}(\text{Now})(\Phi) \rrbracket$  is defined iff there is a contextually salient event and that event possesses a final state. It is true iff there is some  $\phi$ -eventuality, the onset of which occurs within that state. For example, in (2a), repeated below, the eventive verb in the preceding discourse unit introduces an

<sup>8</sup> The idea that ‘now’ picks out a salient event in discourse comes from Altshuler (2009). The implementation of this idea, however, differs from what is proposed here. See Altshuler 2016 for more discussion.

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antecedent. The second sentence thus asserts that there is a stirring event, and that the onset of that event occurs during the final state of the the event of sautéing the onions.

(34) Paul finished sautéing the onions. Now he stirred in the wine.

Applying the null  $\emptyset_{\text{DET} \rightarrow \text{GQ}}$  morpheme to the denotation in (32) derives precisely the denotation specified for ‘now’ in Altshuler 2016. In the next subsection, §4.1, we provide an explanation of the patterns of contrast with non-indexical constructions observed in §2.iii-iv. Subsequently, in §4.2, we show that the application of the null  $\emptyset_{\text{DET} \rightarrow \text{GQ}}$  morpheme also preserves explanations of the observations in §1 identified in Altshuler & Stojnić 2015; Altshuler 2016.

#### 4.1 Comparison with Non-Indexical Uses

First, as noted in §2.iii, (16b) contrasts with (17). This contrast is repeated below:

(35) ??Now that Helene finished her coffee, she was ready to leave the house.

(36) Helene finished her coffee. Now she was ready to leave the house.

Whereas the former is infelicitous with an eventive subordinate clause in simple past, if this clause occurs as a separate sentence, supplying a value for ‘now’ anaphorically, the discourse is notably better. This is predicted by (33). In (35), the infelicity arises from the application of a property of events to (the value of) a state-variable. Nothing of this kind occurs in (36). Instead, the eventive VP in the first sentence introduces a salient event to the discourse, which can serve as an antecedent for the anaphoric use of ‘now’ in the second sentence. The resulting truth conditions are predicted to be the same as those of (16a), repeated below.

(37) Now that Helene had finished her coffee, she was ready to leave the house.

Second, (18) was noted to contrast with (20) (repeated below):

(38) Now that Uri enjoyed his job, he looked forward to going to work.

(39) Uri enjoyed his job. ??Now he looked forward to going to work.

Whereas the former is felicitous with a stative subordinate clause in simple past, if this clause occurs as a separate sentence, the discourse is notably worse. This is also predicted by (33), as a result of the difference between presupposition accommodation and the accommodation of antecedents for anaphora. Given existential closure of the event-variable, (38) presupposes the existence of a salient event resulting in a state of Uri enjoying his job. In contrast, the event-variable is left free in (39), requiring an antecedent event to be supplied in the discourse.

It is widely noted that markedness generated by the need to accommodate antecedents for anaphora is substantially worse than that generated by the accommodation of presuppositions.

- (40) Q: Who is picking up Jim from the airport?  
A: His sister will pick him up.
- (41) Q: Who is picking up Jim from the airport?  
A: ??She will pick him up.

The question-answer pair in (40) is acceptable discourse initially. Even if the conversational context does not already support presupposition of the definite – i.e., that Jim has a female sibling – the accommodation of this information is automatic. In contrast, absent a salient woman in the conversational context, (41) is judged unacceptable.

Hence, the presupposition in (38) that there was a change-of-state event resulting in Uri enjoying his job should be expected to be accommodated relatively easily. This appears correct, even when the sentence occurs discourse initially. In contrast, when occurring discourse initially, (39) is expected to be far less acceptable. The second sentence is in need of a salient event as an antecedent for ‘now’, yet the stative verb in the first sentence fails to introduce one.

It is a further prediction of this account that (39) should improve if embedded within a discourse which entails the existence of an event with a final state which overlaps the onset of Uri looking forward to going to work. This is borne out in the discourse below.

- (42) Uri used to hate coming in to work. He had felt useless and directionless. However, as soon as there was a clear purpose to his project, Uri enjoyed his job. Now he looked forward to going to work.

Notice that the discourse in (42) lacks any overt antecedent for anaphora (since it contains only stative verbs), but entails a salient change of state event which can satisfy this role.

## 4.2 Further Data Involving Indexical Uses

In the previous subsection, we showed how our analysis explains the contrasts between the non-indexical and indexical uses of ‘now’. In this subsection, we show how our analysis preserves the insight in Altshuler & Stojnić 2015; Altshuler 2016, discussed in §1, concerning the indexical use of ‘now’.

First, the contrast between (4a-4b) and the infelicity of (5), repeated below in (43a-43b) and (44) respectively, is explained immediately as an instance of the

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inability to accommodate an eventive antecedent for 'now' in a discourse containing statives, as discussed in the previous section.

- (43) a. Yvonne arrived home. Now she made herself a cup of coffee.  
b. Yvonne was at home. ??Now she made herself a cup of coffee.
- (44) I like to think back to the summer of '82. ??I was so happy now.

Second, where the value of the free event variable is provided anaphorically, 'now' is predicted to be sensitive to a difference in the prominence of antecedents in discourse. This will account for the contrast between (2a)-(2b), repeated below.

- (45) a. Paul finished sautéing the onions. Now he stirred in the wine.  
b. Paul finished sautéing the onions and waited 5 minutes. Now he stirred in the wine.

Unlike in (2a), in (2b) the most recent event introduced in the discourse is the waiting-event. Accordingly, it is this event (rather than the sautéing event) which functions as the antecedent for 'now' in the discourse, with the result that a different constraint is placed on the onset time of the stirring event in the second sentence.<sup>9</sup>

Third, the analysis accounts for deictic uses such as (1a), repeated below, by taking the speech event to be available as an antecedent.<sup>10</sup>

- (46) Two years ago, I thought I would be happy now.

Where the event argument of 'now' is fixed deictically in this way, the onset time of the eventuality introduced by a sentence will be required to occur during the final state of the speech event. It thereby also accounts for the contrast between (47.a-b):

- (47) a. I am happy now.  
b. I am happy.

(47a), unlike (47b), is associated with an implication that the speaker has not always been happy. This is directly predicted on the present account. Whereas the former merely requires the state of being happy to overlap the speech time (due to

<sup>9</sup> Note that recency of mention is one many factors in resolving anaphora. For more discussion of other factors guiding anaphora resolution, see, e.g. Hobbs 1979; Polanyi 1988; Beaver 1999; Asher & Lascarides 2003; Kehler, Kertz, Rohde & Elman 2008; Stojnić 2016 and references therein.

<sup>10</sup> See Zeevat 1999; Bittner 2007; Hunter 2010, 2013 who build on Stalnaker's (1978) idea that as soon as someone speaks up, various discourse referents are introduced into the discourse context. Crucially, the speech event is a discourse referent that is available for anaphoric pick up. See also van Eijck & Kamp 1996 for discussion.

the contribution of present tense), the latter requires its onset to occur during some final state which overlaps the speech time.<sup>11</sup>

Note that ‘now’ can only function deictically when the constraints it imposes are consistent with the tense of the clause it occurs in. Hence it is predicted to be unavailable in past-tensed clauses, which are typically assumed to require the onset of the eventualities they introduce to precede the speech event. This is borne out in (8a), repeated below.

(48) ??I now showed you to your room.

A deictic reading is also not available in the absence of an eventive antecedent in (20), repeated below, for the same reason.

(49) Uri enjoyed his job. ??Now he looked forward to going to work.

Fourth, we predict the constraining effect on the reference time observed in (7a), repeated below.

(50) I will now show you to your room.

Assuming future tense requires, minimally, overlap between the eventuality introduced in the clause and some time succeeding the speech time, deictic uses of ‘now’ will be compatible with future tense. However, under the assumption that (some) final states are transient (i.e., they do not endure indefinitely), the presence of ‘now’ should impose a constraining effect on the onset of the eventuality in the clause, which is otherwise absent, cf. (7b), repeated below.

(51) I will show you to your room.

Finally, the analysis also accounts for the contrast in (6), repeated below.

- (52) a. I hit him because he hit me.  
 b. ??I hit him because now he hit me.  
 c. I hit him, so now he hit me.

In (52b), the past tense of the second clause forces an anaphoric reading of ‘now’. Without further, prior discourse, the only available antecedent is the event of hitting in the first clause. Hence, the onset of the eventuality in the second clause must occur after the conclusion of the event in the first. Yet this is incompatible with the temporal constraints imposed by ‘because’. On any plausible treatment of the

<sup>11</sup> Note that the fact that (47.a) is in simple present tense does not require the antecedent event to be the speech event. Rather, it may be any conversationally salient event the final state of which overlaps the speech time.

explanation relation it contributes, the onset of the eventuality introduced in the first clause (i.e., the explanandum) cannot precede the onset of the eventuality introduced in the second clause (i.e., the explanans). As such, the sentence should be expected to improve either in the absence of 'now', viz. (52a), or upon the replacement of 'because' with an alternative connective, viz. (52c). Similarly, 'now' should be expected to occur felicitously in the subordinate clause of 'because' if embedded within a discourse which supplies an antecedent preceding the event in the first clause. Altshuler (2016) provides the following naturally occurring example which supports this prediction:

- (53) We recruited three real bargirls who dance in the bar scenes and have a few lines. As we wrapped, one of them came to say goodbye, and started to cry. She said that it was the first time that she had been treated with respect and was able to do a job that she didn't have to be ashamed of. She was crying because she now had to return to working in the bar.<sup>12</sup>

In (53), the preceding sentence in the discourse introduces an event (the event of wrapping up) which, if taken as the antecedent for 'now', yields a temporal structure consistent with the semantics of 'because'.

## 5 A Taxonomy of Subordinating Temporal Modifiers

On standard analyses, 'now' patterns with 'then' to form a pair of temporal indexicals.<sup>13</sup> In anaphoric uses (54a-b), these stand in the same proximal/distal relationship as 'this'/'that'; 'here'/'there'; etc.

- (54) a. Paul finished sautéing the onions. Now he stirred in the wine.  
b. Paul finished sautéing the onions. Then he stirred in the wine.

However, the present account highlights substantial differences between the two. Most notably, 'then' lacks a non-indexical use - constructions equivalent to (9) in which it takes a subordinate clause (e.g. (55)) are ungrammatical.

- (55) \*Then that Liza reached the ridge, she could see the summit above her.

When its non-indexical use is taken as basic, the behavior of 'now' is more naturally assimilated to a class of *subordinating temporal modifiers* - expressions such as 'while', 'before', 'after', etc.:

- (56) a. After Eve inflated the balloons, Claude hung up the decorations.  
b. Before Eve inflated the balloons, Claude hung up the decorations.  
c. While Eve inflated the balloons, Claude hung up the decorations

<sup>12</sup> <http://screenanarchy.com/2005/04/paul-spurrier-talks-thailand-ghosts-and-p.html>

<sup>13</sup> See Schiffrin (1992) for a discussion of 'then' in various discourse contexts. See also Rossdeutscher (2005) for a discussion of 'then' and the German counterpart 'dann'.

As in non-indexical constructions with ‘now’, in each of (56a-c), the temporal properties of the event in the main clause are constrained relative to temporal properties of the event in the subordinate clause. In (56a), the onset of the hanging event is required occur after the conclusion inflating event; in (56b), the conclusion of the hanging event is required to occur before the onset of the of the hanging event; and, in (56c), minimally, the run-times of the two events are required to overlap. Similarly, the subordinate clause (but not the main clause) is not-as-issue in each case.

The absence of an indexical use of either ‘after’, ‘before’, or ‘while’ appears, at first, to constitute a point of disanalogy with the ‘now’. However, as demonstrated in (57a-c), for each subordinating temporal modifier there exists a corresponding morphologically-derived non-subordinating expression which functions anaphorically.

- (57) a. Eve inflated the balloons. Afterwards Claude hung up the decorations.  
 b. Eve inflated the balloons. Beforehand Claude hung up the decorations.  
 c. Eve inflated the balloons. Meanwhile Claude hung up the decorations

(57a-c) stand in a close relation to (56a-c), respectively, which mirrors the relation that we have seen between discourses involving anaphoric use of ‘now’ and sentences involving its non-indexical use. This relation can be elegantly accounted for if we assume that the morphemes ‘-wards’, ‘-hand’, ‘mean-’ with which the expressions combine play a semantic role, denoting the type-shifting operator in (33). If so, they would thereby constitute overt realisations of the null morpheme  $\emptyset_{\text{DET} \rightarrow \text{GQ}}$  posited in §4. Likewise, the existence of a class of subordinating temporal modifiers with a morphologically derived anaphoric use provides taxonomic support for taking the non-indexical use of ‘now’ as basic.

## 6 Conclusion

We have noted the existence of a use of ‘now’ in which it takes a subordinate clause and functions non-indexically, and have argued that this use of ‘now’ should be taken as primitive. On the proposed view, the root meaning for the expression has the abstract type of a determiner, and the more widely discussed, indexical use is derived through a type-shifting mechanism.

A number of questions remain outstanding. To begin with, ‘now’ often appears to imply causal dependence between the eventuality in the main clause and subordinate clause, an implication which is absent in other subordinating temporal modifiers. For example, whereas (58) appears wholly acceptable, (59) is marked - seemingly



'Now' with subordinate clauses

due to the implausibility of a causal connection between the subordinate and main clause eventualities. An analogous contrast is provided in (60-61).

(58) While John was in Barcelona, it started raining in London.

(59) ??Now that John was in Barcelona, it started raining in London.

(60) Henry VIII became King of England while the Aztec empire was at its peak.

(61) ??Henry VIII became King of England now that the Aztec empire was at its peak.

While strong, the implication appears to be defeasible in certain case. For example, (62) appears acceptable despite the absence of causal dependence between the two states:

(62) Now that it was 6pm in London, it was mid-day in New York.

One potential source of explanation for the causal dependence implication might be found in the limitations (non-indexical uses of) 'now' places on the discourse relations which can obtain between their clausal arguments. Coherence relations, which place constraints on the discourse structure, are standardly taken to constrain the temporal properties of their relata (Hobbs 1985, Lascarides & Asher 1993, Asher & Lascarides 2003). It follows from the proposed meaning of 'now' in (21) that a given coherence relation can hold between the subordinate and main clauses of 'now' only if it is compatible with the onset time of the eventuality denoted in the latter occurring strictly later than the event whose final state is denoted in the former. Thus, relations which are standardly taken to require overlap (e.g., ELABORATION, BACKGROUND) or to require the onset of the first relatum to occur after the conclusion of the second (e.g., EXPLANATION) are excluded. From among the class of coherence relations most commonly posited, this leaves only NARRATION, and those relations associated with it (most notably, RESULT)<sup>14</sup> as candidates for relating the two clauses<sup>15</sup>. If such relations, which typically imply causal dependence between their relata, are required as a consequence of the semantics of 'now', this could account for the (defeasible) implication observed in (59) and (61). Nevertheless, without elaboration, this line of explanation remains, at most, promissory.

Another outstanding issue is that other subordinating temporal modifiers (e.g. 'after', 'before', 'while') exhibit morphologically derived anaphoric uses and yet

14 See Altshuler & Varasdi 2015 and Altshuler 2016 for arguments that RESULT asymmetrically entails NARRATION.

15 We assume, as is observed with, e.g. conditional constructions, that the main clause eventuality must be co-ordinated with- or subordinated to- the subordinate clause eventuality, and not vice versa.



none can be used deictically to locate the clause in which they occur relative to the speech time. Since nothing in their semantic contribution precludes this, this is a noteworthy and unexplained absence on the present account.

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