


Constraints on Propositional Anaphora

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18 November 2020

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- Individual anaphora

(1) 'Moana' is about a young girl. *She* saves the world.

- Event anaphora

(2) My cousin saw it in 3D. I'm still dying to do *that*.

- Propositional anaphora

(3) 'Moana' is the #1 movie in the country. I heard *that* on the radio.

- Many propositions can be sentence implications of a single utterance

(4) Moana, who is the daughter of a Polynesian chief, teams up with the demigod Maui and together they save the world.

↪ Moana teams up with Maui.

↪ Moana and Maui save the world.

↪ Moana exists.

↪ A Polynesian chief exists.

↪ Moana is the daughter of a Polynesian chief.

↪ Maui exists.

↪ Maui is a demigod.

↪ The speaker of (4) speaks English.

⋮

- Which propositions are available for anaphora? When? How?

Outline

- 1 Discourse-level: At-issueness & Propositional anaphora
 - At-issueness
 - Anaphora to Not-at-issue Content
 - Anaphora to At-issue Content
 - Discussion
- 2 Sentence-level: Introducing propositional discourse referents
 - Two existing approaches to this issue
 - Subclausal constructions
 - Multiclausal constructions
 - Generalization
 - One implementation

A note on formatting

- In the following examples,
at-issue content-denoting phrases in boldface
propositional anaphors in italics
propositional antecedents underlined
- (7) **(Who is Tamatoa?)**
Tamatoa, voiced by Ricky Gervais, **is a very shiny lobster.**
- a. *No, that's not true, he's a very shiny crab.*

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- One idea: Propositional anaphora is sensitive to discourse status
Only at-issue content is available for anaphoric reference

My goal

Demonstrate that at-issueness and anaphoric availability are distinct

- 1 At-issue status is not necessary for anaphoric availability
- 2 At-issue status is not sufficient for anaphoric availability

Defining at-issueness

- Not all content conveyed by an utterance has the same status
 - Conveyed content can be at-issue or not-at-issue
 - Simons et al. 2010 defines at-issue content as content which addresses the question under discussion (QUD, Roberts 1996)
- (5) Q: **Who is Maui?**
A: **Maui**, who is voiced by Dwayne Johnson, **is a demigod**.
- (6) Q: **Who plays Maui?**
A: # **Maui**, who **is voiced by Dwayne Johnson**, is a demigod.
- Appositive content can't address the QUD \rightsquigarrow is not-at-issue
 - Matrix content addresses the QUD \rightsquigarrow is at-issue

At-issueness & anaphora licensing

(7) **Tamatoa**, voiced by Ricky Gervais, is a very shiny lobster.

a. *No, that's not true, he's a very shiny crab.*

(7) **Tamatoa**, voiced by Ricky Gervais, is a very shiny lobster.

b. ? *No, that's not true, he's voiced by Jermaine Clement.*

- Easy to refer anaphorically to the at-issue matrix content
- Harder to refer to the not-at-issue appositive content
- AnderBois et al. 2010 and Murray 2014 introduce propositional variables for at-issue content
- Syrett & Koev 2014 interprets experimental data on anaphora to appositive content (like (7b)) as proving “shifting at-issue status” of appositives, on the assumption that all and only at-issue content is available for anaphora

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The idea

- Content which is at-issue addresses the QUD
- Content which doesn't address the QUD is not-at-issue
- If not-at-issue content can be available for anaphora, then at-issue status is **not a necessary condition** for anaphoric availability

Appositives

(8) [Context: Mark is a teacher. His parents come to visit during a school assembly. His father is looking around the auditorium, curious about Mark's students.]

Dad: **Where are Mark's students sitting?**

Mom: **Lisa, who is Mark's favorite, is sitting in the front row.**
He told me *that* in confidence, though, so don't tell anyone.

- Explicit QUD addressed by the at-issue matrix clause
- Appositive content doesn't address the QUD, is not-at-issue
- Anaphor *that* targets the appositive content
- ∴ not-at-issue content can be available for anaphora

Reports

- Speech reports convey multiple propositions which can be at-issue (Simons 2007, see also Hunter & Asher 2016)

(9) A: Who was Louise with last night?

B: Henry thinks she was with Bill. (Simons 2007 (2))

(10) A: What is bothering Henry?

B: He thinks Louise was with Bill last night. (Simons 2007 (3))

- Either the matrix (reporting) content or the embedded (report) content can be at-issue in a context

Reports

(11) Q: **Who was at the party?**

A: Kevin said Meghan was there. Erin told me *that*.

- Explicit QUD addressed by the embedded report
- The matrix content attributing the source is not-at-issue
- Very natural reading for Erin to have spoken about Kevin: *that* targets the matrix reporting
- ∴ not-at-issue content can be available for anaphora

- ∴ at-issue status is not necessary for anaphoric availability

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The idea

- Content which addresses the QUD is at-issue
 - “at-issue content may include non-conventional content as well, e.g. conversational implicatures which arise as a result of the utterance in context.” (Roberts et al. 2009)

(12) A: I have to pay this bill.

B: The customer accounts office isn't open today.

(at-issue: A won't be able to pay.) (Roberts et al. 2009 (9))

- “a presupposition... can have main point status” (Simons 2005)

(13) Ann: The new guy is very attractive.

Bud: Yes, and his wife is lovely too.

(at-issue: The new guy has a wife.) (Simons 2005 (10))

- If at-issue content fails to be available for anaphora, then at-issue status is **not a sufficient condition** for anaphoric availability

Presupposition

- Presuppositions can be at-issue (see, e.g., Simons 2005)

(14) Q: **Does Vicky have any siblings?**

A: Her brother is a chef, just like me. Her mom told me *that*.

✓ that he's a chef

#that **he exists**

- Explicit QUD addressed by a presupposition, triggered by *her brother*
- Anaphor *that* can't be taken to address the at-issue presupposition
- This proposition is at-issue, but is not available for anaphora

Entailment

- Entailments can be at-issue (Roberts et al. 2009)

(15) [Context: Kim and Jessie are high school students. Kim's mom asks Jessie's:]

Q: Where was Kim last night? **Was she at the party?**

A: The whole class was there! Jessie told me *that*.

✓ that the whole class was at the party

#that **Kim was at the party**

- Explicit QUD is about Kim, response is about the whole class
- QUD is addressed by an entailment of the answer (*whole class* \models *Kim*)
- Anaphor *that* can't be taken to refer to the proposition about Kim
- This proposition is at-issue, but fails to be available for anaphora

Implicature

- Implicatures can be at-issue (Roberts et al. 2009)

(16) Q: **Will Gretchen be able to make the meeting?**

A: There's a pile-up on I-287. Alexa told me *that*.

✓ that there is a pile-up on I-287

#that **Gretchen won't make the meeting**

- Explicit QUD is about Gretchen, literal response is about traffic
- QUD is only addressed by conversational implicature
- Anaphor *that* can't refer to the implicated proposition about Gretchen
- At-issue content can fail to be available for anaphora
- ∴ at-issue status is not sufficient for anaphoric availability

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Summary

- 1 Content which is not-at-issue can be available for anaphora
 \rightsquigarrow at-issue status is not necessary for anaphora
 - 2 Content which is at-issue can fail to be available for anaphora
 \rightsquigarrow at-issue status is not sufficient for anaphora
- At-issueness & anaphoric potential are distinct
 - Need a detailed explanation of what *does* license anaphora
 - If not conditioned by discourse status, then what?

Not just salience

- Looking back at our examples that didn't license anaphora

(14) Her brother is a chef ↗ 'her brother exists'

(15) The whole class was there! ↗ 'Kim was there'

(16) There's a pile-up on I-287. ↗ 'Gretchen won't make it'

Q: What do these have in common?

A: The at-issue content isn't denoted by any syntactic constituent

- \llbracket her brother \rrbracket is an individual
- \llbracket her brother is a chef \rrbracket is a proposition, but not the one we want
- \llbracket her brother \rrbracket requires us to presuppose the existence proposition, but doesn't denote it
- Maybe we need to look to syntax, rather than discourse status
- Salience in discourse isn't sufficient

- Reminiscent of the Anaphoric Island Constraint/Formal Link Condition (Postal 1969; Kadmon 1987; Heim 1990, a.o.)

The Formal Link Condition (Simplified)

A pronoun must have an overt NP antecedent, and this antecedent cannot be a sub-part of a word

- (17) a. One of the ten balls is missing from the bag.
It's under the couch.
- b. # Nine of the ten balls are in the bag.
It's under the couch. (Partee 1989)
- (18) a. Fritz owns a dog and it bites him.
- b. # Fritz is a dog-owner and it bites him. (cf. Evans 1977)
- (19) a. Followers of McCarthy are now puzzled by his intentions.
- b. # McCarthyites are now puzzled by his intentions. (Postal 1969)

Formal Link Condition, continued

- Argued to be gradient, not categorical, for nominal anaphora (Anderson 1971; Patel-Grosz & Grosz 2010 a.o.)
- Equivalent for propositional anaphora?

- (20)
- a. Ned, who was Tina's secret admirer, had lunch with her without admitting *that* to her.
 - b. ? Ned, Tina's secret admirer, had lunch with her without admitting *that* to her.
 - c. ?? Tina's secret admirer Ned had lunch with her without admitting *that* to her.

- Clausal appositive, nominal appositive, and prenominal modifier all convey the same proposition
- Not just salience: maybe syntactic factors in play, too

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- Karttunen 1969 is a comprehensive look at which indefinite noun phrases (NPs) can be referred to by pronouns

(21) Lucy has a car. *It* is blue.

(22) # Lucy doesn't have a car. *It* is blue.

- In his terms, which NPs introduce **discourse referents** (drefs)
 - For our purposes, these are *individual* drefs
- Based on (21) & (22), we can observe that NPs under sentential negation don't introduce individual drefs
- Karttunen's (1969) conclusion: indefinite NPs introduce drefs in sentences whose propositional content is "asserted, implied or presupposed by the speaker to be true"

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A syntactic approach

- Krifka 2013 argues that the introduction of drefs is done by specific syntactic projections
 - ν P introduces event drefs
 - ActP introduces speech act drefs
 - TP (and other higher projections like NegP) introduces pdrefs

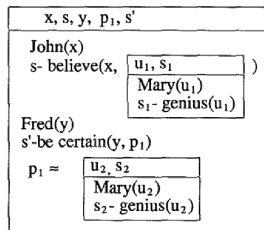
$[\text{ActP } \text{ASSERT } [\text{NegP } \text{Ede did-n't } [\text{TP } t_{\text{Ede}} t_{\text{did}} [\text{vP } t_{\text{Ede}} t_{\text{steal}} \text{steal the cookie}]]]$
 $\hookrightarrow d_{\text{speech act}} \quad \hookrightarrow d'_{\text{prop}} \quad \hookrightarrow d''_{\text{prop}} \quad \hookrightarrow d'''_{\text{event}}$

(Krifka 2013: (22))

- Each syntactic projection introduces a dref for its contents
- This approach makes strong testable predictions
- Call this approach **TP+**

A discursive approach

- One could identify pdref introduction with particular structures from work on discourse relations & structure (Asher 1993; Carlson & Marcu 2001; Asher et al. 2012; Hunter & Asher 2016; Asher et al. 2017)
 - Discourse Relation Structures (DRSs) (and subDRSs) from DRT
 - Or otherwise identified *elementary discourse units* (EDUs)



(Asher 1993:242)

- The idea here is that, for every box/EDU, there is an associated label (\equiv pdref)
- Can be tricky to identify, but there are guidelines in place, so it is testable
- Call this approach **EDU**

- With two approaches available, how do we decide between them?
Throw a whole bunch of data at them!
- Looked at data from subclausal, monoclausal, multicausal, and multisentential constructions (Snider 2017a)
- In the next 2 sections, we'll look at some particularly interesting cases
- I'll argue that neither approach is sufficient
- Instead, the approach we need must be sensitive to semantics

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A semantic generalization

Operators which take propositional arguments introduce propositional discourse referents for those arguments

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A semantic generalization

Operators which take propositional arguments introduce propositional discourse referents for those arguments

- Then I'll demonstrate an implementation in a dynamic semantics

A methodological note

- Before introducing the data, a note on what these tests will look like
- We're testing the availability of anaphoric reference to a proposition

(25) $[p \dots [q? \dots]]$

- We want to know if q is available, but p always is!
- We need a way to ensure that p isn't a viable antecedent

A methodological note

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- We're testing the availability of anaphoric reference to a proposition

(25) $[p \dots [q? \dots]]$

- We want to know if q is available, but p always is!
- We need a way to ensure that p isn't a viable antecedent
- I'm using what I call a *Moore's frame*

(26) # It's raining but I don't believe it's raining. (*Moore's paradox*)

- Using sentences which deny the truth of the matrix antecedent
 - If there is no other antecedent pdref, the sentence will be infelicitous
 - If it is felicitous, there must be an antecedent other than p
 - ∴ there must be a pdref for q

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Small clause constructions

- Small clause constructions involve an NP and a predicate (which constitute the small clause, SC) after a main verb
- They can introduce a secondary predication, a cause, a result, or an epistemic state, among other things (Wilder 1991)

(27) Linus painted the fence red.

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(27) Linus painted the fence red.

- Some disagreement on whether SCs are VPs (Wilder 1991) or PrPs (Bowers 1993), but syntacticians agree they're sub-TP

Predictions

- TP+** SCs don't introduce pdrefs (sub-TP)
- EDU** Unstated, unless SCs are 'clausal complements' (then they all do)

Small clause constructions

- Most types of SCs behave don't introduce pdrefs:

- (28) # Lucy wanted her steak rare, but *that's* not true. (It's medium.)
 SECONDARY PREDICATION
- (29) # Lucy made Charlie angry, but *that's* not true. (He's happy.)
 CAUSATIVE
- (30) # The rabbi pronounced them married, but *that's* not true.
 (They're single.) RESULTATIVE

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(29) # Lucy made Charlie angry, but *that's* not true. (He's happy.)
 CAUSATIVE

(30) # The rabbi pronounced them married, but *that's* not true.
 (They're single.)
 RESULTATIVE

- But epistemic small clauses do introduce pdrefs:

(31) The rabbi considered them married, but *that's* not true.
 (They're single.)
 EPISTEMIC

Small clause constructions

Predictions

TP+	SCs don't introduce pdrefs (sub-TP)	×
EDU	Unstated, unless SCs are 'clausal complements' (→ all do)	?/×

- As is, this data is challenging to both approaches
- For **TP+** to be right, (30) & (31) must differ syntactically
 - e.g., the epistemic SC in (31) must be a covert infinitive
 - This isn't a priori implausible, but requires a change to our syntax
- For **EDU** to account for this data,
 - *them married* would constitute an EDU in (30)
 - *them married* wouldn't constitute an EDU in (31)

NP adverb constructions

- Constructions where an adverb modifies an NP are also test cases

Predictions

TP+ Only TP+ adverbs introduce pdrefs (not NPs)

EDU Only elliptical or temporal adverbs are EDUs

NP adverb constructions

- Constructions where an adverb modifies an NP are also test cases

Predictions

TP+ Only TP+ adverbs introduce pdrefs (not NPs)

EDU Only elliptical or temporal adverbs are EDUs

- Most NP adverbs don't introduce pdrefs

(32) # Lucy lifted a fairly heavy box, but I don't believe *that*. DEGREE

(33) # Lucy lifted a surprisingly heavy box, but I don't believe *that*.

EVALUATIVE

- Even the agent-oriented *surprisingly* in (33) doesn't introduce a pdref for 'the box was heavy' (with either a subject/speaker anchor)

NP adverb constructions

(32) # Lucy lifted a fairly heavy box, but I don't believe *that*. DEGREE

(33) # Lucy lifted a surprisingly heavy box, but I don't believe *that*.

EVALUATIVE

- But an epistemic adverb does seem to introduce that pdef

(34) Lucy lifted a supposedly heavy box, but I don't believe *that*.

EPISTEMIC

NP adverb constructions

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(33) # Lucy lifted a surprisingly heavy box, but I don't believe *that*.

EVALUATIVE

- But an epistemic adverb does seem to introduce that pdref

(34) Lucy lifted a supposedly heavy box, but I don't believe *that*.

EPISTEMIC

- Taken simplistically, it seems like *heavy box* would have to constitute a TP in (34) but not in (32) or (33), for **TP+** to be right
- **EDU** is out of luck, as these aren't elliptical or temporal

NP adverb constructions

- One other explanation **TP+** could offer is to interpret (34) as in (35)

(34) Lucy lifted a supposedly heavy box, but I don't believe *that*.

(35) [supposedly [_{TP} Lucy lifted a *t* heavy box]]

≡ Supposedly, Lucy lifted a heavy box.

- This way, epistemic adverbs are above TP (in line with Cinque 1999), so there is a non-matrix proposition to deny
- For this to work, the other inferences must be purely implicated:
 - that the speaker believes 'Some kind of box exists'
 - that the speaker believes 'Lucy lifted that box'
 - that the speaker doesn't believe 'that box was heavy'

Predictions

TP+	Only TP+ adverbs introduce pdrefs (not NPs)	× / ?
EDU	Only elliptical or temporal adverbs are EDUs	×

Interim summary

- From SC and NP adverb constructions, we can already tell that **at least some sub-TP/EDU material has an associated pdref**
- For either of these approaches to be right, we would have to analyze phrases like *them married* and *heavy box* as only sometimes(!) constituting a TP or EDU
- We also have indications of another shortcoming of these approaches, but that will be brought into sharper contrast soon. . .

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Raising and control constructions

- Much ink has been spilled over raising and control constructions, a topic in every Syntax I class
- Disagreements about whether the embedded clause is a TP or a CP
 - Either way, the embedded clause counts for **TP+**
- Discussed in detail in the discourse structure annotation world
 - Embedded clauses are only EDUs if they are
 - 1 non-infinitive; and
 - 2 the complement of an attribution predicate or a cognitive predicate
 - None of the cases we're about to use fit this description

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Predictions

- TP+** All of the following should introduce pdrefs
- EDU** None of the following should introduce pdrefs

Raising and control constructions

- All subject raising constructions introduce pdrefs (contra **EDU**)

(36) Lucy seemed to be at the party, but *that* wasn't true.
(She was home.) SUBJECT RAISING

Raising and control constructions

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- No object control constructions do (contra **TP+**)

(37) # Patty asked Lucy to be at the party, but Linus didn't believe *that*. (He thought she would stay home.) OBJECT CONTROL

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- Already reason to challenge both approaches
- If it turned out pdref introduction split along
 - raising/control lines, or
 - subject/object lines

how simple the world would be! But...

Raising and control constructions

- Neither object raising nor subject control constructions behave uniformly, as classes

(38) Patty expected Lucy to be at the party, but Linus didn't believe *that*. (He thought she would stay home.) OBJECT RAISING

(39) # Patty wanted Lucy to be at the party, but Linus didn't believe *that*. (He thought she would stay home.) OBJECT RAISING

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- (38) Patty expected Lucy to be at the party, but Linus didn't believe *that*. (He thought she would stay home.) OBJECT RAISING
- (39) # Patty wanted Lucy to be at the party, but Linus didn't believe *that*. (He thought she would stay home.) OBJECT RAISING
- (40) Lucy claimed to be at the party, but *that* wasn't true. (She was home.) SUBJECT CONTROL
- (41) # Lucy tried to be at the party, but *that* wasn't true. (She was home.) SUBJECT CONTROL

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|------------|---|---|
| TP+ | All of the above should introduce pdrefs | × |
| EDU | None of the above should introduce pdrefs | × |

Raising and control constructions

- Complements of embedding verbs *seem*, *expect*, *claim* have associated pdrefs
- Complements of embedding verbs *ask*, *want*, *try* don't
- This is unexpected under either **TP+** or **EDU**

- The crucial observation here seems to be that
whether a construction introduces a pdref depends not just on the embedded structure, but on the embedder

Lots more

DO:

epistemic small clause embedders
 epistemic adverbs
 matrix declaratives
 matrix polar questions
 sentential negation
 epistemic modals
 subject raising verbs
some object raising verbs
some subject control verbs
 likely constructions
 finite clauses (factive & non)
 relative clauses (restrictive & non)
 slifted clauses
that-nominalizations
 conditional antecedents
 conditional consequents
 preadjacent of *even*
 conjunction (both 'juncts)
 disjunction (both 'juncts)

DON'T:

names
 possessive phrases
 lexical presuppositions
 other small clause embedders
 other adverbs
 constituent negation
 root modals
 matrix *wh*- questions
 matrix alternative questions
 matrix imperatives
some object raising verbs
some subject control verbs
 object control verbs
 tough constructions
 slifting parentheticals
for-nominalizations
 preadjacent of *only*
 embedded non-polar interrogatives
 embedded imperatives

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- Nor is the discourse status of their respective propositions (first half of this talk! & Snider 2017b)
- Instead, what seems to matter is what things embed those structures

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- But if we consider sentential mood to 'embed' the matrix clause (à la Bittner 2011), this generalization can extend to matrix clauses as well

A semantic generalization

Operators which take propositional arguments introduce propositional discourse referents for those arguments

- These operators include DECL, NEG, certain verbs, . . .
- Can account for the split on the previous slide

Comparing the generalizations

- Differs from Karttunen's (1969) generalization for individual anaphora
“[a] non-specific indefinite NP in an affirmative sentence (single sentence or a complement) establishes a[n individual] discourse referent just in case the proposition represented by the sentence is asserted, implied or presupposed by the speaker to be true” (13)
 - Sensitive to the (discourse) truth of the context
 - Introduction by the NP for its contents
- But propositional anaphora is different
 - Not sensitive to truth (e.g., preadjacent of sentential negation)
 - Introduction not by the clause-like structure, but by its embedder (e.g., not by the small clause, but by the small clause embedding verb)

Comparing the generalizations

The Formal Link Condition

- One way in which they are similar: they both require the formal representation of the entity being referred to
- Polar interrogatives don't introduce a pdref for the complement of the partitioning proposition (cf. Hamblin 1973)

(42) Did Lucy go to the party? Because Patty told me *that*.

✓ *that*: Lucy went to the party. PARTITIONING PROP

#*that*: Lucy didn't go to the party. COMPLEMENT PROP

(43) # Did Lucy go to the party? Because Patty told me *that*, and she's always reliable, but I think Lucy actually DID_F go!

- Consider this a parallel to Partee's marbles
 - Even a salient complement (proposition) is not available for anaphora

Summary

- Propositional discourse referents are introduced in a variety of contexts
- Neither a syntactic nor discursive approach is sufficient to explain pdref introduction
 - There are subTP/EDU constructions that do, clausal constructions that don't
 - Classes like 'subject control verbs' are not precise enough
- Instead, we must pay attention to the semantic type of an argument
- Pdrefs are introduced not by certain types of clauses, but by the operators which take propositions as arguments
- Unlike individual anaphora, propositional anaphora is insensitive to truth
- But like individual anaphora, it requires a formal representation of the referent

Outline

- 2** Sentence-level: Introducing propositional discourse referents
 - Two existing approaches to this issue
 - Subclausal constructions
 - Multiclausal constructions
 - Generalization
 - One implementation

- If we want to model the introduction of propositional discourse referents by certain operators, we need a formal system which models both reference tracking and propositions
- Bittner's Update with Modal Centering (2011) is one such system
 - UC_{ω} is an update semantics, tracking knowledge in an info state
 - Tracks discourse referents on two lists: \top topical & \perp background
 - Includes variables over individuals (δ), worlds (ω), propositions (ωt), events (ε), states (σ), times (τ)

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(44) Marcie danced

$\rightsquigarrow \top[x|x = \text{marcie}]; [w|\text{danced}_w\langle\top\delta\rangle]$

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(44) Marcie danced

$\rightsquigarrow \top [x | x = \text{marcie}]; [w | \text{danced}_w \langle \top \delta \rangle]$

- Abstracting over tense for the moment
- But even so, this is incomplete. . .

DECL \rightsquigarrow [$p|p = \perp\omega||$]; [$\perp\omega \in \top\omega||$]; [$\top\omega = \perp\omega$]; \top [$p|p = \top\omega||$]

■ Building on Murray 2014, the declarative mood:

- 1 introduces a pdref for its argument (the matrix clause) into the \perp -list,
- 2 triggers a proposal to update,
- 3 updates the context set,
- 4 and then introduces a pdref for the new context set (into the \top -list) as a starting point for subsequent utterances.

DECL \rightsquigarrow [$p|p = \perp\omega||$]; [$\perp\omega \in \top\omega||$]; [$\top\omega = \perp\omega$]; \top [$p|p = \top\omega||$]

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(45) Marcie danced DECL (\equiv Marcie danced.)

\rightsquigarrow \top [$x|x = \text{marcie}$]; [$w|\text{danced}_w\langle\top\delta\rangle$]; [$p|p = \perp\omega||$];
 [$\perp\omega \in \top\omega||$]; [$\top\omega = \perp\omega$]; \top [$p|p = \top\omega||$]

DECL \rightsquigarrow $[p | p = \perp \omega]$; $[\perp \omega \in \top \omega]$; $[\top \omega = \perp \omega]$; $\top [p | p = \top \omega]$

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 $[\perp \omega \in \top \omega]$; $[\top \omega = \perp \omega]$; $\top [p | p = \top \omega]$

- 1 introduces a topical dref for Marcie
- 2 adds the worlds where the topical individual danced
- 3 adds a pdref for those worlds
- 4 triggers a proposal to update
- 5 updates the context set
- 6 introduces a topical pdref for the new context set

- We can extend the same idea to NEG and certain embedding verbs
- Any propositional operator will include $[p|p = \perp\omega||]$ in addition to its lexical contribution

DECL $\rightsquigarrow [p|p = \perp\omega||]; [\perp\omega \in \top\omega||]; [\top\omega = \perp\omega]; \top[p|p = \top\omega||]$

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DECL $\rightsquigarrow [p|p = \perp \omega]; [\perp \omega \in \top \omega]; [\top \omega = \perp \omega]; \top [p|p = \top \omega]$

NEG $\rightsquigarrow [p|p = \perp \omega]; [w|w \notin \perp p]$

- introduces a pdref for its prejacent; introduces p's complement worlds

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NEG $\rightsquigarrow [p|p = \perp\omega||]; [w|w \notin \perp p]$

- introduces a pdref for its prejacent; introduces p's complement worlds

say $\rightsquigarrow [p|p = \perp\omega||]; [w|say_w \langle \top\delta, \perp p \rangle]$

- introduces a pdref for its complement; adds the worlds where the topical individual said p

- We can extend the same idea to NEG and certain embedding verbs
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- introduces a pdref for its prejacent; introduces p's complement worlds

say $\rightsquigarrow [p|p = \perp\omega||]; [w|say_w \langle \top\delta, \perp p \rangle]$

- introduces a pdref for its complement; adds the worlds where the topical individual said p

- And similarly for *seem*, *consider*, *supposedly*, etc.—but not *want*, etc.
- These operators, if in a declarative sentence, will themselves be part of the argument of DECL, thus giving us 2 (or more) pdrefs

Takeaways

- At-issueness isn't the same thing as availability for anaphoric reference
 - At-issue status is neither necessary nor sufficient for anaphoric potential
- The introduction of propositional discourse referents doesn't work the same way as for individuals
 - Not sensitive to truth in the same way
- Our current syntactic & discursive theories don't categorize things in a fine-grained enough way to capture the behavior of pdref introduction
- Instead, we can make the right generalization if we pay attention to semantic type & embedders
- Operators which take propositional arguments (including some matrix moods) introduce pdrefs for those propositional arguments
- We can represent pdref introduction formally, including via UC_{ω}

Thanks!

My thanks to Sarah Murray, Mats Rooth, Will Starr, John Whitman and the Cornell Semantics Group for their advice. Any errors are my own.

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Propositional Formal Link

- (46) a. Kayla Jones, who is an Olympic gold medalist, proposed to her fiancé without telling him *that*.
- b. ? Kayla Jones, an Olympic gold medalist, proposed to her fiancé without telling him *that*.
- c. ?? Olympic gold medalist Kayla Jones proposed to her fiancé without telling him *that*.