Appositive Relative Clauses, At-issueness, and Timing in Discourse

Todor Koev, University of Stuttgart

1 Introduction

- It is standardly assumed that there is a distinction between truth-conditional content (e.g. entailment) and non-truth-conditional content (e.g. presupposition and implicature).
- Another, more recent distinction is made between at-issue content (the “main point” of the utterance) and not-at-issue content (in some sense “secondary” to the main point).
- Ever growing evidence that those two distinctions do not characterize the same two classes of meaning:
  - Non-truth-conditional content is typically not at-issue.

2 Goals of the talk

- Take a fresh look at the notion of at-issueness as instantiated in the truth-conditional domain.
- While the property of (not-)at-issue is often taken to be part of the lexical semantics of the given construction (see e.g. Murray 2010, 2014, AnderBois et al. 2013), I argue that at-issue status can be determined dynamically as discourse unfolds.
- Starting observation (previously noted in AnderBois et al. 2013): The information status of appositive relative clauses (ARCs) depends on their linear position in the sentence.
  - When the ARC occurs sentence-medially it is not at-issue, when it occurs sentence-finally it can be at-issue.\(^1\)
  - Example: the addressee could utter “That’s not true” to reject the appositive content in (2) but not in (1).\(^2\)

(1)  Messi, who once scored a goal with his hand, won the Ballon d’Or.
(2)  Everybody admires Messi, who once scored a goal with his hand.

- Account spoiler: The at-issue status of ARCs is contingent upon the order in which asserted information is introduced in discourse.

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\(^1\) I use the terms “medial” and “final” in the visual, purely descriptive sense here.

\(^2\) ARCs and their contribution to the logical representation (see below) are set apart by an underlining.
• An act of assertion represents a proposal on part of the speaker to reduce the context set. An assertion affects the context set only if the proposal is accepted by the addressee (see Stalnaker 1978, 1999, Groenendijk & Roelofsen 2009, Farkas & Bruce 2010, Murray 2010, 2014, AnderBois et al. 2013, Farkas & Roelofsen ms).

  “An assertion can then be understood as a proposal to alter the context by adding the information that is the content of the assertion to the body of information that defines the context...” (Stalnaker 1999:99)

• Both main clauses and ARCs introduce proposals to narrow down the context set in a specific way.
• Appositive content is often not at-issue because of the discourse rules that govern the way proposals are decided.
  o After a sentence has been uttered, a medial ARC is not at-issue because the proposal associated with it has been implicitly accepted.
  o A final ARC can become at-issue if its proposal is introduced after the proposal associated with the main clause.
• At-issue content is a proposal that has been introduced but has not yet been accepted or rejected in the conversation.
  o At-issueness is not an absolute property but rather is relative to the given stage of the conversation.
  o Semantic content can be not at-issue at a given stage just because it is no more at-issue at that stage, not because it is marked as “not-at-issue” in the grammar.

3 Roadmap

• The truth-conditional status of ARCs
• Diagnosing at-issue content
• Previous approaches to at-issueness
• Explaining the varying information status of ARCs
• The formal account
• Conclusion

4 The truth-conditional status of ARCs

• There is large consensus in the literature that appositives are truth-conditionally relevant in that they express propositional information.
• However: Opinions differ as to the truth-conditional contribution of appositives to the sentence in which they appear.

Another view: Sentences with appositives express multiple truth values (e.g. Berckmans 1994, Bach 1999, Dever 2001, Potts 2005).

- I will endorse the former view: ARCs make a truth-conditional contribution to the sentence in which they appear.
- The divergence of opinion is due to the fact that ARCs often exhibit semantic properties that are usually not associated with truth-conditional content (such as not-at-issue status and projection behavior).
- Will not draw on this issue here: see Syrett & Koev (to appear), who offer robust experimental evidence that appositives (both ARCs and nominal appositives!) contribute to the truth conditions of the entire sentence.
- Participants judge both sentences below as plain false (with an extremely high confidence and without longer RTs).

(3)  
   a. Australia, which is a planet, is in the Southern hemisphere.
   b. Australia is a planet and is in the Southern hemisphere.

- If ARCs indeed express truth-conditional content, we expect them to carry the overall properties of asserted content.
  - Typically have to introduce new information (cf. Stalnaker’s 1978 requirement that assertive content is “not taken for granted” or Potts’ 2005 “antibackgrounding” requirement).

(4) Lance Armstrong survived cancer. #When reporters interview Lance, who is a cancer survivor, he often talks about the disease. (Potts 2005:34/112, slightly modified)

(5) Lance Armstrong survived cancer. #Lance is a cancer survivor and when reporters interview him, he often talks about the disease.

  - ARCs are expected to compete with main clauses for at-issue status. (Also holds, see below!)

5 Diagnosing at-issueness

- The addressee below disagrees with the second sentence, not the first sentence.

(6)  
   A: Matt is rich. He recently bought an apartment in downtown Manhattan.
   B: That’s not true.
• **General intuition:** Since the addressee did not react after the first sentence was uttered, its propositional content was silently accepted and the conversation moved forward to the issue raised by the second sentence.

• **Suggestion:** The most recent assertion is the most likely target of direct responses such as “That’s not true,” i.e. most likely to be “at-issue”.

(7) **AT-ISSUENESS (informal)**

A content $p$ is AT-ISSUE in a discourse $d$ iff $p$ is associated with the most recent assertion in $d$.


(8) **DIRECT RESPONSE TEST**

Only at-issue content can be targeted by directly responses in subsequent discourse.

• Two types of responses:
  o **Direct responses:** signal straightforward agreement or disagreement, e.g. “I agree”, “That’s not true”, “Yes”, “No”, “Maybe”, etc.
  o **Indirect responses:** disrupt the natural flow of discourse, indicating that information that has already been accepted needs to be withdrawn, e.g. “Actually, …”, “Well, …”, “Yes, but …”, etc.

• The Direct Response Test and sentences with ARCs:
  o Medial ARCs disallow direct responses.

(9) **A:** Edna, who is a fearless leader, started the descent.

  **B:** #No, she isn’t. (She is a coward.)

  **B’:** No, she didn’t. (Someone else did.)

  (cf. Amaral et al. 2007:731)

  o Final ARCs can readily take on at-issue status.

(10) **A:** Jack invited Edna, who is a fearless leader.

    **B:** No, he didn’t. (Jack invited someone else.)

    **B’:** No, she isn’t. (She is a coward.)
• **Overall:** The information status of ARCs is sensitive to linear position. When the ARC occurs sentence-medially, only the main clause is at-issue; when, the ARC occurs sentence-finally, either the main clause or the ARC is at-issue.³

• **Aside:** This variability in at-issue status depending on linear position does not seem to hold for nominal appositives, even when these are heavier or include a reduced or restrictive relative clause.

(11) A: Jon Stewart, a journalist, appeared on Larry King Live.  
    B: #That’s not true—Jon Stewart is a comedian.

(12) A: Bill’s wife had dinner with Jon Stewart, a journalist.  
    B: #That’s not true—Jon Stewart is a comedian.

(13) A: Mia recorded a tune with Chick Corea, a very influential saxophone player.  
    B: ?That’s not true—he is a very influential piano player.

(14) A: His dad moved back to Scranton, a city located in the southeast corner of Pennsylvania.  
    B: ?That’s not true—Scranton is located in the northeast corner of Pennsylvania.

(15) A: The department hired Michio Kaku, a Japanese physicist who arrived in the U.S. in his thirties.  
    B: ?That’s not true—Michio Kaku was born in the U.S.

6 Previous approaches to at-issueness

The grammatical approach

• Posits a binary, grammatically encoded distinction between at-issue vs. not-at-issue content (see Murray 2010, 2014, AnderBois et al. 2013; see also Potts 2005).

• Geared towards explaining the information status of truth-conditional content and has been applied to various constructions (i.e. appositives, slipping parentheticals, certain evidential markers).

• At-issue and not-at-issue content differ in how they update the context.
  - At-issue content updates the context indirectly (i.e. by means of introducing a proposal that is accepted by the addressee).
  - Not-at-issue content updates the context directly (i.e. without introducing a proposal).

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³ Another point of variation between medial and final ARCs concerns the possibility that the latter but not the former can attach to quantificational anchors (see Del Gobbo 2003, 2007).

(i) *Few/Most students, who were late, came to the party with their parents.
(ii) They invited few/most students, who arrived very late.  
    (Del Gobbo 2007:176)

It is possible that in (ii) the ARC is attached not to the anchor but to a higher node and does not violate the general ban on attaching ARCs to quantificational anchors (see below).
(16) John, who nearly killed a woman with his car, visited her in the hospital.

(17) a. \( \exists p \land p \subseteq p^\alpha \land \exists x \land x = john \land \exists y \land woman^p(y) \land nearly.kill^p(x, y) \land visit^p(x, y) \)
b. \( \exists p^\alpha \land p^{\alpha'} = p \) (AnderBois et al. 2013, slightly modified)

- **Explaining the data:** Appositive content is not associated with a proposal and is not a good target for direct responses.
- **Problem:** ARCs can become at issue! A more flexible approach is needed.
- Murray’s (2010, 2014) “anaphoric twist” (see also Jayez & Rossari 2004): at-issue content is anaphorically accessible to subsequent discourse (it is represented by a propositional dref) while not-at-issue content is not. This is why direct responses (which typically involve propositional anaphors) can pick up on at-issue content only.
- **But:** Do direct responses necessarily involve propositional anaphors? What about “He is not from Texas, he is from Louisiana” as a response to “Ryan is from Texas”?

**The discourse topic approach**

- Seeks to explain the information status of semantic content in terms of its relationship to the main topic of conversation/the QUD (see Amaral et al. 2007, Roberts et al. 2009, Simons et al. 2010).
- Semantic content is at-issue if and only if it addresses the QUD.
  - A *pragmatic* approach, which does not decide in advance what constructions can or cannot address the QUD.
  - This approach tries to explain at-issueness also in the non-truth-conditional domain.

(18) **AT-ISSUE CONTENT** (after Simons et al. 2010)

A proposition \( p \) is AT-ISSUE relative to a question under discussion \( Q \) if and only if \( p \) entails a partial or complete answer to \( Q \).

- While the utterer below is committed to two propositions (the assertion and the presupposition), only the former proposition addresses the QUD/is at-issue.

(19) *A nutritionist has been visiting first grade classrooms to talk to the children about healthy eating.*

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4 Explicit accounts of how QUDs structure discourse are developed in Ginzburg (1996), Roberts (1996/2012), Büring (2003), and Farkas & Bruce (2010).

5 The far-reaching goal of this approach is to explain projective content in terms of not-at-issue information status. Here, I ignore this second part of the approach.
Q: What most surprised you about the first graders?
A: They didn’t know that you can eat raw vegetables. (Simons et al. 2010:317)

- ARCs fail to felicitously address QUDs made explicit by singleton questions.

(20) Q: What disease did Tammy’s husband have?
   A: #Tammy’s husband, who had prostate cancer, was treated at the Dominican Hospital.
   A’: #The doctors of the Dominican Hospital treated Tammy’s husband, who had prostate cancer.
   (after AnderBois et al. 2013)

- But: When a conjoined question is asked (and the main clause answers one part while the appositive answers the other part) the judgments improve.²

(21) Q: What did Paula bring and when did she leave the party?
   A: ?Paula, who brought a chocolate dip, left after midnight.

(22) Q: Who did you meet at the party and what did she bring?
   A: I met Paula, who brought a chocolate dip.

- More examples of ARCs addressing (“superquestion”) QUDs.

(23) Q: Who’s coming to the dinner tonight?
   A: Well, I haven’t talked to Charles, who probably won’t be able to come, but I did talk to Sally, who is coming.
   (Simons et al. 2010:323)

(24) Q: What happened last night at the party?
   A: Kevin, who got drunk, started pole dancing.

- Conclusion: ARCs (including medial ARCs) can sometimes address the QUD and be at-issue.
  o The idea of at-issueness as addressing the QUD might not be the same as the recency-based notion of at-issueness defended here.
  o Or maybe the contrast between medial and final ARCs in confirmed when it comes to interacting with the QUD (21)-(22) and the data in (23)-(24) are “exceptional”, given the general “superquestion” nature of the QUD there?

7 Explaining the varying information status of ARCs

First component: Illocutionary independence

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² I owe the idea of using conjoined questions in this context to Veneeta Dayal.
• ARCs perform speech acts that are independent from the speech act performed by the rest of the sentence (cf. Thorne 1972, Emonds 1979, McCawley 1988, Peterson 2004, Arnold 2007).
• Easy to see in “hybrid sentences,” i.e. combinations of assertions and questions.

(25)  
a. Has John, who was talking to Mary a minute ago, gone home?  (McCawley 1988:445)
b. I invited Sarah, whom Jeremy wanted to meet, didn’t he?

• Sentence-level adverbials like “frankly” can occur in ARCs but not in illocutionarily dependent clauses like restrictive relatives.

(26)  
a. The girl, who frankly he had praised, left the room blushing.
b. *The girl who frankly he had praised left the room blushing.  (Thorne 1972:553)

• Where in the grammar does the illocutionary independence of ARCs come from? Two options available:
  o ARCs are marked by a COMMA feature, which has both a semantic and intonational effect (see Potts 2005, Selkirk 2005).7
  o Either could explain why both main clauses and ARCs introduce update proposals.

Second component: Discourse constraints on deciding proposals

(27)  
(i) IMMEDIACY
    A proposal is decided (i.e. accepted or rejected) before another, independent proposal is introduced.

(ii) IMPLICIT ACCEPTANCE
    If not addressed, a proposal is implicitly accepted.

• Two proposals are independent if they are compatible with each other, i.e. both can be accepted without producing the empty context set. A proposal and a rejection/counterproposal are typically incompatible and thus are not independent.
• The principles at work:

7 Potts’ proposal is not that intonational phrases in principle require a COMMA feature to be present in the syntax. This would vastly overgenerate, as intonational breaks are often inserted between syntactic constituents that share the same information status (see e.g. Selkirk 2005). Rather, his claim seems to be that if the COMMA feature is present, the phrase associated with it is intonationally and semantically isolated (see Potts 2005:92).
Matthew is rich. He recently bought an apartment in downtown Manhattan.

a. $\phi^\circ \land \psi^\circ$ # Immediacy # Implicit Acceptance

b. $\phi^\circ \land \text{reject}(p) \land \psi^\circ$ ✓Immediacy # Implicit Acceptance

c. $\phi^\circ \land \psi^\circ \land \text{accept}(p)$ # Immediacy ✓Implicit Acceptance

d. $\phi^\circ \land \text{accept}(p) \land \psi^\circ$ ✓Immediacy ✓Implicit Acceptance

Third component: Attachment site of ARCs

- Two major proposals about the attachment site of ARCs:
  - Local attachment approaches: ARCs are attached to their anchors (e.g. Jackendoff 1977, Kayne 1994, de Vries 2006, Citko 2008).
  - External attachment approaches: ARCs are generated outside the host clause but are linearized as adjacent to their anchors by some exceptional mechanism (e.g. Ross 1967, Emonds 1979, McCawley 1982, Safir 1986).
- ARCs are interpreted in situ, as anaphoric processes demonstrate (see Nouwen 2007, AnderBois et al. 2013).

Teresa, who knocked down her boss, visited him in the hospital.

- However, final ARCs can sometimes be non-adjacent to their anchors, e.g. when separated from them by temporal adverbials.

a. I was talking to [an American] yesterday, who has lived in Kuwait for 20 years.

b. I was just with [George McGovern] today, who looks with great graciousness upon Richard Nixon as a formidable opponent. (both examples from COCA)

- My claim: Medial ARCs are attached to their anchors, final ARCs can be attached to a higher node (including at sentence level).
- Medial ARCs: Assuming that proposals are introduced at the end of the phrase they are associated with, the appositive proposal is introduced before the main clause proposal and automatically accepted. Only the main clause proposal is at-issue.

a. [Edna [who is a fearless leader]] started the descent (ARC not at-issue)

b. $MC^p \land \text{ARC}^q \land \text{accept}(q) \land MC^p$ ?p

- Final ARCs:
If the ARC is attached to a lower node (e.g. to its anchor), the appositive proposal is introduced first and automatically accepted.

If the ARC is attached to the entire sentence, the main clause proposal is introduced first and is automatically accepted while the appositive proposal is at-issue. This structure is similar to a juxtaposition of two independent sentences

(32) a. Jack followed [Edna [who is a fearless leader]] (ARC not at-issue)
b. \[MC'' \land ARC'' \land accept(q)\] ?p

(33) a. [Jack followed Edna] [who is a fearless leader] (ARC at-issue)
b. \[MC'' \land accept(p) \land ARC''\] ?q

- One prediction: Since medial ARCs introduce proposals, they are expected to be open to direct responses immediately after they have been uttered.

(34) A: Edna, who stole the diamonds…
    B: That’s not true.

- Another prediction: At a given point of conversation, typically only one proposal is still open. In sentences with final ARCs either the main clause or the appositive is at-issue, but typically not both.\(^8\)

(35) A: Jack likes Edna and she is a wonderful person.
    B: I agree with both of those things.

(36) A: Jack likes Edna, who is a wonderful person.
    B: ?I agree with both of those things.

8 The formal account

The logic: Update with Speech Contexts

\(^8\) Judith Tonhauser asks about examples as in (i) below, where the proposals are not independent and thus both should be open after the sentence is uttered. Why does this sentence sound contradictory?

(i) \#Jack, who is not here, is here.

I believe the infelicity of (i) has to do with the fact that proposals are introduced when an agent publicly commits to a proposition (see below). By uttering (i), the speaker commits to two contradictory propositions and ends up with the empty discourse commitment set.
- A typed **update semantics**, in which sentences denote functions from information states to information states (see Heim 1982, Veltman 1996).

- Two important formal features:
  - Records not only the context set but also individual **discourse commitments** (see Gunlogson 2001, Groenendijk & Roelofsen 2009, Farkas & Bruce 2010). Needed because an act of assertion amounts to updating the commitments of its utterer (without necessarily also updating the context set).

- **Speech contexts**: consists of two individuals and three sets of worlds, representing the speaker, the hearer, the discourse commitments of the speaker, the discourse commitments of the hearer, and the context set (respectively).

\[
\text{(37)} \quad c = \langle c_{SP}, c_{HR}, c_{DC\text{-af}\text{-}SP}, c_{DC\text{-af}\text{-}HR}, c_{CS} \rangle \quad \text{(speech context)}
\]

- **Types:**
  - \(e\) individuals
  - \(\omega\) possible worlds
  - \(s\) assignment functions
  - \(t\) truth values
  - \(\omega t\) propositions (sets of words)
  - \(e \times e \times \omega t \times \omega t \times \omega t\) speech contexts (quintuples of two individuals and three propositions)
  - \(st\) info states (sets of assignment functions)
  - \((st)st\) dynamic terms (functions from info states to info states)

- **Models:** \(M = \mathcal{D}, \mathcal{W}, \mathcal{G}, \{T,F\}, I\), where \(\mathcal{D}\) = a set of individuals, \(\mathcal{W}\) = a set of possible worlds, \(\mathcal{G}\) = a set of assignment functions, \(\{T,F\}\) = truth values, \(I\) = the basic interpretation function.\(^9\)

Higher-order domains for objects of complex types are recursively built from these sets.

- **Info(rmation) states**: sets of assignment functions, i.e. \(\sigma \subseteq \mathcal{G}\), for any info state \(\sigma\).

\[
\text{(38)} \quad \text{Def (SEMANTICS)}
\]

(i) **PRIMITIVE TERMS**

\[
[t]^e\sigma = \begin{cases} g(t) & \text{if } t \text{ is a variable} \\ I(t) & \text{if } t \text{ is a constant} \end{cases}
\]

(ii) **FUNCTIONAL TERMS**

- \([sp(c)]^e\sigma = sp([c]^e\sigma)\)

\(^9\)In what follows, I drop reference to models.
• \( [\text{hr}(c)]^{\varepsilon,\sigma} = \text{hr}([c]^{\varepsilon,\sigma}) \)
• \( [\text{dc}_{sp}(c)]^{\varepsilon,\sigma} = \text{dc}_{sp}([c]^{\varepsilon,\sigma}) \)
• \( [\text{dc}_{hr}(c)]^{\varepsilon,\sigma} = \text{dc}_{hr}([c]^{\varepsilon,\sigma}) \)
• \( [\text{cs}(c)]^{\varepsilon,\sigma} = \text{cs}([c]^{\varepsilon,\sigma}) \)
• \( [\max(p)]^{\varepsilon,\sigma} = \{w \mid \exists h \in \sigma : w \in [p]^{\varepsilon,\sigma} \} \)

(iii) DYNAMIC TERMS

• \( \sigma[R_{t_1},...,t_n] = \{g \in \sigma \mid \forall w \in [p]^{\varepsilon,\sigma} : \langle w, [t_1]^{\varepsilon,\sigma}, ..., [t_n]^{\varepsilon,\sigma} \rangle \in [R]^{\varepsilon,\sigma} \} \)
• \( \sigma[t_1 R t_2] = \{g \in \sigma \mid [t_1]^{\varepsilon,\sigma} R [t_2]^{\varepsilon,\sigma} \} \), where \( R \in \{=,\subseteq,\varnothing\} \)
• \( \sigma[\phi \land \psi] = \sigma[\phi][\psi] \)
• \( \sigma[\exists u] = \{h \mid \exists g \in \sigma \forall v : \text{if } v \neq u \text{ then } h(v) = g(v)\} \)

• For a speech context variable \( c \), \( \text{sp}(c) = \) the speaker of \( c \), \( \text{hr}(c) = \) the hearer of \( c \), \( \text{dc}_{sp}(c) = \) the discourse commitments of the speaker of \( c \), \( \text{dc}_{hr}(c) = \) the discourse commitments of the hearer of \( c \), and \( \text{cs}(c) = \) the context set of \( c \).
• \( \max(p) \) = the maximal value of the propositional term \( p \) in an info state \( \sigma \), i.e. the set of worlds that are contained in any value assigned to \( p \) in \( \sigma \).
• Dynamic terms describing lexical predicates are relativized to sets of worlds which collect the propositional information expressed (see Stone 1999, Stone & Hardt 1999). For example, \( \text{sloth}_p(x) \) only keeps assignments \( g \) which verify that \( g(x) \) is a sloth throughout the worlds in \( g(p) \). Subscripting lexical predicates with propositional variables is crucial for distinguishing appositive proposals from main clause proposals!
• \( \varnothing \) stands for the non-overlap relation between sets, i.e. \( p \varnothing q \) amounts to \( p \cap q = \varnothing \).

(39) CONDITIONS ON SPEECH CONTEXTS

For any speech context \( c \) the following conditions hold:
(i) \( \text{sp}(c) \) is publicly committed to \( \text{dc}_{sp}(c) \), and \( \text{hr}(c) \) is publicly committed to \( \text{dc}_{hr}(c) \)
(ii) \( \text{dc}_{sp}(c) \subseteq \text{cs}(c) \) and \( \text{dc}_{hr}(c) \subseteq \text{cs}(c) \)

• A discourse-initial information state \( \sigma^{a,b} \) anchors the utterance context to a unique speaker \( a \) and a unique hearer \( b \). I will use the distinguished variable \( k \) to represent the utterance context; other speech contexts are represented as \( c, c' \), etc.

(40) Def (DISCOURSE-INITIAL INFORMATION STATE)

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10 The semantic rules for primitive and functional terms are relativized to assignment functions as well as entire information states. Access to assignments is needed in order to interpret variables dynamically while access to entire information states is required for the interpretation of \( \max(p) \).
A DISCOURSE-INITIAL INFORMATION STATE anchored to a speaker $a$ and a hearer $b$ is the info state defined as $\sigma^{ab} := \{ g \mid a = sp(g(k)) \text{ and } b = hr(g(k)) \}$.

- For a given utterance context, the values of its individual commitments coordinates and the context set coordinate need not be maximal. Definitions for the maximal values of the discourse commitment sets and the context set in a given info state.

(41) Def (DISCOURSE COMMITMENTS, CONTEXT SET)
In a given info state $\sigma$, the DISCOURSE COMMITMENTS of the speaker, the DISCOURSE COMMITMENTS of the hearer, and the CONTEXT SET are defined as follows:

(i) $DC_{sp}(\sigma) := \max(dc_{sp}(k))$ for $\sigma$
(ii) $DC_{hr}(\sigma) := \max(dc_{hr}(k))$ for $\sigma$
(iii) $CS(\sigma) := \max(cs(k))$ for $\sigma$

- From the restriction on speech contexts in (39ii), it follows that $DC_{sp}(\sigma) \subseteq CS(\sigma)$ and $DC_{sp}(\sigma) \subseteq CS(\sigma)$, for any info state $\sigma$.

The logic at work

- Simple sentences ($k$ stands for the context of utterance; dynamic terms contributed by discourse are placed in a box):

(42) a. Edna is a fearless leader.

\[
\exists p \land \exists x \land x = edna \land fearless\textunderscore leader(p, x) \land dc_{sp}(k) \subseteq p \]

(OK.)

b. $\exists p \land \exists x \land x = edna \land \text{fearless\textunderscore leader}(p, x) \land dc_{sp}(k) \subseteq p$ \hspace{1cm} \text{cs}(k) \subseteq p$

- I assume that the first and the third part of the representation are due to the comma feature/the declarative force of the sentence.
- If the proposal is accepted, the context set is restricted with the content of $p$.
- What if the proposal is rejected? Rejecting a proposal = introducing a counterproposal (a proposal that is incompatible with the original proposal), which in turn be accepted or rejected.
- We need abbreviations for negation and change of discourse roles in order to model rejections.
- **Negation**: introduces a dref encoding the proposition of the non-negated sentence and states that this proposition is disjoint from the proposition expressed by the negated sentence (see Stone & Hardt 1999).

(43) \( \text{not}^p(\phi) := \exists q \land \phi \land p \not\max(q), \)
\( p, q \) = propositional variables, \( \phi \) = dynamic term in which \( q \) occurs freely, \( \varnothing \) = the non-overlap relation)

(44) Edna is not a fearless leader.
   a. \( \exists p \land \exists x \land x = edna \land \exists q \land \text{fearless.leader}(x) \land p \varnothing \text{max}(q) \land dc_w(q) \subseteq p \)
   b. \( \exists p \land \text{not}(\exists x \land x = edna \land \text{fearless.leader}(x)) \land dc_w(q) \subseteq p \)

• Aside: This way of defining negation (or other propositional operators) accounts for the projection behavior of appositives past propositional operators. Negation only binds the material that is part of the same proposal!

(45) a. Mary doesn’t like [Bill, who is a douchebag]. \( \models \) Bill is a douchebag.
   b. \( \exists p \land \text{not}(\exists x \land x = mary \land \exists y \land y = bill \land \text{like}(x, y) \land \\
       \exists r \land \text{douchebag}(y) \land dc_w(q) \subseteq r) \land dc_w(k) \subseteq p \)

• Change of discourse roles: the coordinates for the speaker and the hearer and their discourse commitments are swapped while the context set coordinate is inherited.

(46) \( \text{cdr}(k) \) :=

\[
\exists c \land \\
\begin{array}{l}
\text{sp}(k) = \text{hr}(c) \land \text{hr}(k) = \text{sp}(c) \land \text{dc}_w(q) = \text{dc}_w(c) \land \text{dc}_w(k) = \text{dc}_w(c) \land \text{cs}(k) = \text{cs}(c) \land \\
\end{array}
\]

\( \exists k \land k = c \)

• The shape of the utterance context:
  o There is a unique speaker and hearer across an info state (follows from the definition of a discourse-initial information state in (40) and an occasional change of discourse roles expressed by the term in (46) guarantee that
  o The discourse commitment coordinates are included in the context set coordinate (follows from the restriction in (39ii)).
  o The discourse commitment coordinates and the context set coordinate present their maximal values and all of possible subsets (since variable assignment is exhaustive).\(^{11}\)

\(^{11}\) Making the simplifying assumption that discourse development is monotonic, those subsets represent the possible developments of a discourse commitment set/the context set.
\[ \sigma \quad k \]

\[ g_1 \quad \langle a, b, \{ w_1 \}, \{ w_2 \}, \{ w_1, w_2 \} \rangle \]

\[ g_2 \quad \langle a, b, \{ w_1 \}, \{ \}, \{ w_2 \} \rangle \]

\[ g_3 \quad \langle a, b, \{ \}, \{ w_2 \}, \{ w_1, w_2 \} \rangle \]

\[ g_4 \quad \langle a, b, \{ \}, \{ \}, \{ w_1, w_2 \} \rangle \]

\[ g_5 \quad \langle a, b, \{ \}, \{ w_2 \}, \{ w_2 \} \rangle \]

\[ g_6 \quad \langle a, b, \{ \}, \{ \}, \{ w_2 \} \rangle \]

\[ g_7 \quad \langle a, b, \{ w_1 \}, \{ \}, \{ w_1 \} \rangle \]

\[ g_8 \quad \langle a, b, \{ \}, \{ \}, \{ w_1 \} \rangle \]

\[ g_9 \quad \langle a, b, \{ \}, \{ \}, \{ \} \rangle \]

\[ \textbf{Figure 1:} \text{ A hypothetical information state } \sigma \]

- Back to rejecting proposals:

(47) A: Edna is a fearless leader.

\[ \exists p \land \exists x \land x = edna \land \text{fearless.leader}_p(x) \land \text{dc}_p(k) \subseteq p \]

[\text{cdr}(k)]

B: No, she isn’t.

\[ \exists q \land \text{not}\_p(\text{fearless.leader}_p(x)) \land \text{dc}_p(k) \subseteq q \]

Defining at-issue content

- Proposals get introduced when a conversational agent publicly commits to a proposition (see e.g. Farkas & Bruce 2010).

(48) Def (PROPOSAL)

A proposition \( p \) is a PROPOSAL to update the context set in an information state \( \sigma \) if a discourse participant has publicly committed to \( p \) in \( \sigma \), i.e. if \( DC_sp(\sigma) \subseteq p \) or \( DC_hr(\sigma) \subseteq p \).

(49) Def (AT-ISSUE CONTENT)

A proposition \( p \) is AT-ISSUE in an information state \( \sigma \) if

(i) \( p \) is a proposal in \( \sigma \), and

(ii) \( p \) has not yet been accepted or rejected in \( \sigma \).

- Semantic content is at-issue not in some absolute sense but rather relative to an info state: a proposition can be at-issue in some but not other states. Proposals are typically at-issue only shortly after they have been introduced.
• Content is “not at-issue” either because it is not associated with a proposal at all (violating (49i)) or because it is associated with a proposal that has already been accepted or rejected (violating (49ii)).

• Unlike some previous approaches, a positively defined notion of “not-at-issue content” has no theoretical role to play. The intuition of not-at-issueness is nothing more than a by-product of the dynamics of introducing, accepting, and rejecting proposals.

Back to ARCs: Information status and truth-conditional contribution

• Medial ARCs: The appositive proposal is introduced before the main clause proposal and automatically accepted. The main clause proposal remains at-issue.

(50) a. [Edna [who is a fearless leader]] started the descent
   b. \(\exists p \land \exists x \land x = edna \land \exists q \land \text{fearless.leader}_r(x) \land \text{dc}_w(k) \subseteq q \land [\text{es}(k) \subseteq q] \land \text{start.descent}_r(x) \land \text{dc}_w(k) \subseteq p\)

• This explains why only directly targeting the main clause (but not the ARC) is felicitous.\(^{12}\)

(50) c. No, she didn’t. \hspace{1cm} (target = main clause)
   d. \(\exists r \land \text{not}_r'(\text{start.descent}_r(x)) \land \text{dc}_w(k) \subseteq r\)

(50) e. #No, she isn’t. \hspace{1cm} (target = ARC)
   f. \(\exists r \land \text{not}_r'(\text{fearless.leader}_r(x)) \land \text{dc}_w(k) \subseteq r\)

• Final ARC:
  
  o If the ARC is attached to a lower position, the proposal associated with it is automatically accepted and the main clause proposal is at-issue (and is freely accessible to direct rejections).

(51) A: Jack followed [Edna [who is a fearless leader]]

\[\exists p \land \exists x \land x = jack \land \exists y \land y = edna \land \exists q \land \text{fearless.leader}_r(y) \land \text{dc}_w(k) \subseteq q \land [\text{es}(k) \subseteq q] \land \text{follow}_r(x, y) \land \text{dc}_w(k) \subseteq p\]

\[\text{cdr}(k)\]

B: No, he didn’t. \hspace{1cm} (target = main clause)

\(\exists r \land \text{not}_r'(\text{follow}_r(x, y)) \land \text{dc}_w(k) \subseteq r\)

\(^{12}\) If (59)-(60) or (59)-(61) are conceived as dialogues, the speaker and the hearer switch discourse roles, a represented in the logic as \(\text{cdr}(k)\).

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If the ARC is attached to the top node of the sentence, the main clause proposal is introduced first and is silently accepted while the appositive proposal remains at-issue.

(a) **A:** [Jack followed Edna] [who is a fearless leader]

\[
\exists p \land \exists x \land x = jack \land \exists y \land y = edna \land follow_p(x, y) \land dc_{wp}(k) \subseteq p \land \left[ cs(k) \subseteq p \right] \land \\
\exists q \land \text{fearless.leader}_q(y) \land \text{dc}_{wp}(k) \subseteq q \\
\text{edr}(k)
\]

**B:** No, she isn’t.

\[
\exists r \land \text{not}’(\text{fearless.leader}_r(x, y)) \land \text{dc}_{wp}(k) \subseteq r
\]

- Direct responses can then target either a main clause or a final ARC, depending on which structure is chosen!
- This reasoning derives the somewhat puzzling fact that the information status of ARCs can vary depending on their linear position in the sentence.
- **Truth-conditionality:** Both main clauses and ARCs contribute information that is added to the context set, i.e. contribute fresh information. This holds despite the illocutionary independence or the particular information status of ARCs.

**Some related constructions**

- **Clausal conjunctions:** Superficially similar to sentences with ARCs but differ from sentences with ARCs in that the conjuncts are relativized to a single proposal and thus both conjuncts are available to direct responses.

(b) \[
\exists p \land \exists x \land x = edna \land \text{fearless.leader}_p(x) \land \text{start.descent}_p(x) \land \text{dc}_{wp}(k) \subseteq p
\]

- **Restrictive relative clauses:** Lack the occasional not-at-issue status of ARCs and are interpreted intersectively with the head noun. The content of the head noun and that of the relative clause are relativized to the same proposal.

(c) \[
\exists p \land \exists x \land \text{woman}_p(x) \land \text{speaker}_p(x) \land \text{start.descent}_p(x) \land \text{dc}_{wp}(k) \subseteq p
\]

- **Nominal appositives:** Diverge from ARCs in that they cannot be a target of a direct rejection, even when they occur sentence-finally.

**A:** Jon Stewart, a journalist, appeared on Larry King Live.
B: #That’s not true—Jon Stewart is a comedian.

A: Bill’s wife had dinner with Jon Stewart, a journalist.
B: #That’s not true—Jon Stewart is a comedian.

- According to the Direct Response Test then, nominal appositives appear invariably not at-issue.
- Two possible explanations for the invariably not-at-issue status of nominal appositives.
  - Option 1: Nominal appositives (similarly to ARCs) introduce independent proposals (57a). But since nominal appositives are locally attached, their proposals are automatically accepted.
  - Option 2: Nominal appositives do not introduce proposals but are grammatically specified as not-at-issue content (57b). (This is the same analysis AnderBois et al. 2013 give for ARCs.)

(56) The crowd greeted Vladimir, a famous hockey player.

(57) a. $\exists p \wedge \exists x \wedge crowd_p(x) \wedge \exists y \wedge y = vladimir \wedge greet_p(x, y) \wedge \exists q \wedge famous.hockey.player_s(y) \wedge dc_s(k) \subseteq q \wedge \text{cs}(k) \subseteq q \wedge dc_s(k) \subseteq p$

b. $\exists p \wedge \exists x \wedge crowd_p(x) \wedge \exists y \wedge y = vladimir \wedge greet_p(x, y) \wedge \text{famous.hockey.player}_{s(2)}(y) \wedge dc_s(k) \subseteq p$

- Option 1 relies on specific assumptions about the attachment site of nominal appositives but offers a unified approach to information status that cuts across different appositive types and is thus preferable on theoretical grounds.
- Option 2 elegantly captures the not-at-issue status of nominal appositives but introduces a novel semantic mechanism in addition to the one that has been independently motivated for ARCs.

9 Conclusion and outlook

- While the property of at-issueness is sometimes thought to be lexically triggered, I argued that (in a number of cases) it can arise from the way the discourse game of introducing and deciding information is structured.
- The main argument came from the observation that the information status of ARCs can vary depending on linear position: not at-issue for medial ARCs, potentially at-issue for final ARCs.
- This variability in information status was explained by the claim that ARCs bear independent illocutionary force and as such compete with the main clause for at-issue status. The intuition that ARCs are often not at-issue was explained by the assumption that appositive proposals are usually introduced before main clause proposals and thus—given the discourse rules of deciding proposals—are automatically accepted.
The account demonstrates that the notion of “not-at-issue content” can be reduced to other, more general and independently motivated concepts.

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References


