Generalized quantifiers and clarification

Robin Cooper
University of Gothenburg

Jonathan Ginzburg
Univ. Paris–Diderot, Sorbonne Paris Cité

An Introduction to Semantics using Type Theory with Records
ESSLLI 2012
Lecture 4, part 2

Some references

Cooper (2010) (paper at SemDial in Poznań)

draft paper submitted to *Dialogue and Discourse* (`https://sites.google.com/site/semttr/lectures/gqrch.pdf`)

Outline

Outline

Reprise questions as clarification requests

Unknown: What are you making?
Anon 1: Erm, it's a do- it's a log.
Unknown: A log?

The Reprise Content Hypothesis (RCH)

Purver and Ginzburg (2004); Ginzburg and Purver (2008)

RCH (weak) A fragment reprise question queries a part of the standard semantic content of the fragment being reprised.

RCH (strong) A fragment reprise question queries exactly the standard semantic content of the fragment being reprised.

Outline

A type for a "quantified proposition"

- $$\begin{bmatrix} \text{restr} & : & \mathit{Ppty} \\ \text{scope} & : & \mathit{Ppty} \\ \text{c}_q & : & q(\text{restr},\text{scope}) \end{bmatrix}$$

A type for a "quantified proposition"

- $$\begin{bmatrix} \text{restr} & : & \mathit{Ppty} \\ \text{scope} & : & \mathit{Ppty} \\ \text{c}_q & : & q(\text{restr},\text{scope}) \end{bmatrix}$$
- $\text{every}(\lambda r{:}[\text{x}{:}\mathit{Ind}]([\text{c}{:}\text{dog}(r.\text{x})]),\ \lambda r{:}[\text{x}{:}\mathit{Ind}]([\text{c}{:}\text{run}(r.\text{x})]))$

A type for a "quantified proposition"

- $\begin{bmatrix} \text{restr} & : & \mathit{Ppty} \\ \text{scope} & : & \mathit{Ppty} \\ \text{c}_q & : & q(\text{restr},\text{scope}) \end{bmatrix}$
- $\text{every}(\lambda r{:}[\text{x}{:}\mathit{Ind}]([\text{c}{:}\text{dog}(r.\text{x})]),\ \lambda r{:}[\text{x}{:}\mathit{Ind}]([\text{c}{:}\text{run}(r.\text{x})]))$
- $q(\text{restriction},\text{scope})$

A thief broke in here last night

- *thief* – "the property of being a thief"
- *bihln* – "the property corresponding to *broke in here last night*"
- $$\begin{bmatrix} \text{restr}=\text{`}\textit{thief}\text{'} & : & \textit{Ppty} \\ \text{scope}=\text{`}\textit{bihln}\text{'} & : & \textit{Ppty} \\ c_{\exists} & : & \exists(\text{restr},\text{scope}) \end{bmatrix}$$

Getting back to classical GQ theory

Barwise and Cooper (1981)

- The *extension* of type T, $[\check{}T]$, is the set $\{a \mid a : T\}$.
- The *P-extension* of property P, $[\downarrow P]$, is the set $\{a \mid \exists r[r : [\mathrm{x}{:}Ind] \wedge r.\mathrm{x} = a \wedge [\check{}P(r)] \neq \emptyset]\}$.
- The type $q(P_1, P_2)$ is non-empty iff the relation q^* holds between $[\downarrow P_1]$ and $[\downarrow P_2]$. (Constraint on models)
- For example:
  - some(P_1,P_2) is non-emtpy ("true") just in case $[\downarrow P_1] \cap [\downarrow P_2] \neq \emptyset$.
  - every(P_1,P_2) is non-emtpy ("true") just in case $[\downarrow P_1] \subseteq [\downarrow P_2]$.
  - many(P_1,P_2) is non-emtpy ("true") just in case $| [\downarrow P_1] \cap [\downarrow P_2] | > n$, where n counts as many.

Witness sets

- a witness for a type is something which is of that type
- a quantifier q is *conservative* means q^* holds between $[\downarrow P_1]$ and $[\downarrow P_2]$ just in case q^* holds between $[\downarrow P_1]$ and $[\downarrow P_1] \cap [\downarrow P_2]$ (*every person runs* iff *every person is a person who runs*)
- all natural language quantifier relations are conservative (Peters and Westerståhl, 2006)
- $a : q(P_1, P_2)$ iff q^* holds between $[\downarrow P_1]$ and $[\downarrow P_2]$ and $a = [\downarrow P_1] \cap [\downarrow P_2]$

A modification of Ginzburg and Purver

type of (potential) witness sets $a : q^{\dagger}(P)$ iff $a \subseteq [\downarrow P]$ and there is some set X such that q^{*} holds between $[\downarrow P]$ and X.

modified Ginzburg and Purver

$$\begin{bmatrix} \text{q-params} & : & [\text{w:most}^{\dagger}(\text{student})] \\ \text{cont} & : & [\text{c}_q\text{=q-params.w:most(student,left)}] \end{bmatrix}$$

Putting the two analyses together

referential

$$\left[\begin{array}{l}\text{q-params}:\left[\begin{array}{ll}\text{restr}_i=\text{student}:\mathit{Ppty} & \\ \text{w}_i & :\text{most}^{\dagger}(\text{q-params.restr}_i)\end{array}\right] \\ \text{cont}= \\ \quad \lambda P{:}\mathit{Ppty} \\ \qquad \left(\left[\begin{array}{ll}\text{scope}=P & :\mathit{Ppty} \\ \text{c}_{\text{most}}=\Uparrow\text{q-params.w}_i & :\text{most}(\Uparrow\text{q-params.restr}_i, \\ & \text{scope})\end{array}\right]\right):\mathit{Quant}\end{array}\right]$$

non-referential

$$\left[\begin{array}{l}\text{q-params}:\mathit{Rec} \\ \text{cont}= \\ \quad \lambda P{:}\mathit{Ppty} \\ \qquad \left(\left[\begin{array}{l}\text{restr}_i=\text{student}:\mathit{Ppty} \\ \text{w}_i:\text{most}^{\dagger}(\text{restr}_i) \\ \text{scope}=P:\mathit{Ppty} \\ \text{c}_{\text{most}}=\text{w}_i:\text{most}(\text{restr}_i,\text{scope})\end{array}\right]\right):\mathit{Quant}\end{array}\right]$$

Outline

What can clarifications address?

- must be a path in the record type
- tends to be a "major constituent"

Predictions for NP clarification requests

- witness (for a referential reading)
- restriction (dispreferred for syntactic reasons)
- content (possible with restriction or quantifier relation focus)

Witness clarifications

Unknown: And er they X-rayed me, and took a urine sample, took a blood sample. Er, the doctor
Unknown: Chorlton?
Unknown: **Chorlton**, mhm, he examined me, erm, he, he said now they were on about a slide ⟨unclear⟩ on my heart. Mhm, he couldn't find it.

BNC file KPY, sentences 1005–1008

Witness clarifications, *contd.*

Terry: Richard hit the ball on the car.
...
Nick: What ball?
Terry: **James [last name]'s football**.

BNC file KR2, sentences 862, 865–866

Restriction clarifications – additional material (locative relative clause)

George: You want to tell them, bring the tourist around show them the spot
Sam: The spot?
George: **where you spilled your blood**

BNC file KDU, sentences 728–730

Restriction clarifications – NP with additional modifier (relative clause)

Terry: Richard hit the ball on the car.
Nick: What car?
Terry: **The car that was going past**.

BNC file KR2, sentences 862–864

Restriction clarifications – NP with additional modifier (noun compound)

Anon 1: In those days how many people were actually involved on the estate?

Tommy: Well there was a lot of people involved on the estate because they had to repair paths. They had to keep the river streams all flowing and if there was any deluge of rain and stones they would have to keep all the pools in good order and they would

Anon 1: The pools?

Tommy: Yes the pools. That's **the salmon pools**

Anon 1: Mm.

BNC file K7D, sentences 307–313

Restriction clarifications – NP with complement

Eddie:	I'm used to sa-, I'm used to being told that at school. I want you ⟨pause⟩ to write the names of these notes up here.
Anon 1:	The names?
Eddie:	**The names of them**.
Anon 1:	Right.

BNC file KPB, sentences 417–421

Restriction clarifications – NP with noun compound

Nicola: We're just going to Beckenham because we have to go to a shop there.
Oliver: What shop?
Nicola: **A clothes shop**. ⟨pause⟩ and we need to go to the bank too.

BNC file KDE, sentences 2214–2217

Restriction clarification request clarification

Anon 1: Er are you on any sort of medication at all Suzanne? Nothing?
Suzanne: No. Nothing at all.
Anon 1: Nothing? **No er things from the chemists and cough mixtures or anything** ⟨unclear⟩?

BNC file H4T, sentences 43–48

Restriction clarifications – non-monotonic modifier substitution

Elaine:	what frightened you?
Unknown:	The bird in my bed.
Elaine:	The what?
Audrey:	The birdie?
Unknown:	**The bird in the window**.

BNC file KBC, sentences 1193–1197

Restriction clarifications – non-monotonic restriction replacement

Mum: What it ever since last August. I've been treating it as a wart.
Vicky: A wart?
Mum: **A corn** and I've been putting corn plasters on it

BNC file KE3, sentences 4678–4681

Restriction clarifications – monotonic modifier substitution

Stefan:	Everything work which is contemporary it is decided
Katherine:	Is one man?
Stefan:	No it is a woman
Katherine:	A woman?
Stefan:	**A director who'll decide**.

BNC file KCV, sentences 3012–3016

Restriction clarifications – searching for the right noun

Unknown: What are you making?
Anon 1: Erm, it's a do- it's a log.
Unknown: A log?
Anon 1: **Yeah a book, log book**.

Restriction clarifications – difficult to classify

Richard: No I'll commute every day
Anon 6: Every day?
Richard: **as if, er Saturday and Sunday**
Anon 6: And all holidays?
Richard: Yeah ⟨pause⟩

BNC file KSV, sentences 257–261

Quantifier relation clarifications

Anon 2: Was it nice there?
Anon 1: Oh yes, lovely.
Anon 2: Mm.
Anon 1: It had twenty rooms in it.
Anon 2: **Twenty rooms?**
Anon 1: **Yes**.
Anon 2: How many people worked there?

BNC file K6U, sentences 1493–1499

Quantifier relation clarifications, *contd.*

Marsha: yeah that's it, this, she's got three rottweilers now and
Sarah: **three?**
Marsha: **yeah**, one died so only got three now ⟨laugh⟩

BNC file KP2, sentences 295–297

Outline

Generalized quantifiers and the Reprise Content Hypothesis

- Purver and Ginzburg's data fit the predictions of the classical GQ anatomy

Generalized quantifiers and the Reprise Content Hypothesis

- Purver and Ginzburg's data fit the predictions of the classical GQ anatomy
- Unclarities vary within the range of the predictions

Generalized quantifiers and the Reprise Content Hypothesis

- Purver and Ginzburg's data fit the predictions of the classical GQ anatomy
- Unclarities vary within the range of the predictions
- Responses to clarification questions provide clues to the meaning of the clarification request

Generalized quantifiers and the Reprise Content Hypothesis

- Purver and Ginzburg's data fit the predictions of the classical GQ anatomy
- Unclarities vary within the range of the predictions
- Responses to clarification questions provide clues to the meaning of the clarification request
- Does this point to the weak version of RCH?

Bibliography I

Barwise, Jon and Robin Cooper (1981) Generalized quantifiers and natural language, *Linguistics and Philosophy*, Vol. 4, No. 2, pp. 159–219.

Cooper, Robin (2010) Generalized quantifiers and clarification content, in P. Łupkowski and M. Purver (eds.), *Aspects of Semantics and Pragmatics of Dialogue. SemDial 2010, 14th Workshop on the Semantics and Pragmatics of Dialogue*, Polish Society for Cognitive Science, Poznań.

Ginzburg, Jonathan (2012) *The Interactive Stance: Meaning for Conversation*, Oxford University Press, Oxford.

Bibliography II

Ginzburg, Jonathan and Matt Purver (2008) Quantfication, the reprise content hypothesis, and type theory, in L. Borin and S. Larsson (eds.), *From Quantification to Conversation*, University of Gothenburg, University of Gothenburg, Gothenburg.

Peters, Stanley and Dag Westerståhl (2006) *Quantifiers in Language and Logics*, Oxford University Press.

Purver, Matt and Jonathan Ginzburg (2004) Clarifying noun phrase semantics, *Journal of Semantics*, Vol. 21, No. 3, pp. 283–339.