Question-Answer Congruence and the Proper Representation of Focus

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Question/Answer Congruence: Paul on Karl and Fritz

Hermann Paul, *Prinzipien der Sprachgeschichte*, 1880, §197

- Psychological subject / psychological predicate (≈ focus)
- Focus determined by context, e.g. constituent questions
- Focus expressed by accent

(1) *Wer fährt morgen nach Berlin?*
[KARL]$_F$ *fährt morgen nach Berlin.*

(2) *Wohin fährt Karl morgen?*
Karl fährt morgen [nach BerLIN]$_F$

(3) *Wann fährt Karl nach Berlin?*
Karl fährt [MORgen]$_F$ *nach Berlin.*

(4) *Wie reist Karl morgen nach Berlin?*
Karl [FÄHRT]$_F$ *morgen nach Berlin.*

Paul also had the notion of a default accentuation:

(5) *Karl fährt morgen nach BerLIN.*

But he didn't entertain the notions of broad focus or multiple focus:

(6) *Was macht Karl?*
Karl [fährt morgen nach BerLIN]$_F$

(7) *Wer fährt morgen wohin?*
[KARL]$_F$ *fährt morgen [nach BerLIN]*$_F$

Paul forty years later, and the Berlin/Potsdam Axis of Information Structure Research

Hermann Paul, *Deutsche Grammatik,* 1919, Vol. III Part IV §54

Same content, different examples:

(8) *Wer fährt morgen nach Potsdam?*
[*FRITZ*]$_F$ *fährt morgen nach Potsdam.*

(9) *Wohin fährt Fritz morgen?*
Fritz fährt morgen [*nach POTSdam*]$_F$

(10) *Wann fährt Fritz nach Potsdam?*
Fritz fährt [*MORgen*]$_F$ *nach Potsdam.*

(11) *Wie reist Fritz morgen nach Potsdam?*
Fritz [*FÄHRT*]$_F$ *morgen nach Potsdam.*

(The SFB 623 Potsdam/Berlin on Information Structure
takes this to be a good omen
for its work!)

Possible Reactions to Questions and Congruent Answers

Paul considered a particular relation between questions and answers,
so-called **congruent answers** (cf. von Stechow 1990).

Many other reactions to questions are possible:

(12) Q: *When will Karl go to Berlin?*

a. A: *Karl will go to Berlin toMORrow.* ← Congruent Answer
b. A: *Karl doesn't go to Berlin.*
c. A: *Karl will go to Berlin tomorrow, with Fritz.*
d. A: *Karl already went to Berlin.*
e. A: *I don't know.*

Decision to concentrate first on congruent answers seems justified,
as they can be considered, pretheoretically, the simplest and most straightforward ones.

In particular, they allow for so-called short answers:

f. A: *Tomorrow.*

Congruent Answers and the Theory of Questions and Focus

The notion of congruent answers is elementary
for any semantic theory of questions and of focus.

Purpose of this talk:

Point out certain aspects of congruent question-answer relationships
that might tell us about how the meaning of questions and the meaning of focus
is to be conceived.

The points made here are based on:

Krifka (2001), “For a structured meaning account of questions and answers”

Krifka (to appear), “The semantics of questions and the focusation of answers“

Two Theories of Questions

PS: The Proposition Set Approach to Questions

Hamblin 1958, 1973; Karttunen 1977:

- Meaning of a question: the set of propositions that are its possible congruent answers (Karttunen: its possible true answers)

Example:

(13) Q: *Where will Fritz go?*

A1: *Fritz will go to Berlin.*
A2: *Fritz will go to Potsdam.*
etc.

Hence: ‖*Where will Fritz go?*‖
= {‖*Fritz will go to Berlin*‖, ‖*Fritz will go to Potsdam*‖, ...}
= {GO(BERLIN)(FRITZ), GO(POTSDAM)(FRITZ), ...}
= {GO(X)(FRITZ) | X∈{BERLIN, POTSDAM, ...}}
= {GO(x)(FRITZ) | X∈ PLACE}

(14) Q: ‖*Who will go to Berlin?*‖
= {GO(BERLIN)(FRITZ), GO(BERLIN)(KARL), ...}
= {GO(BERLIN)(x) | x∈ PERSON}

SM: The Structured Meaning / Functional Approach to Questions

Ajdukiewicz 1928, Cohen 1929, Hull 1975, Tichy 1978, Hausser & Zaefferer 1979, Stechow & Zimmermann 1984, Stechow 1990, …

➢ The meaning of a question is a function that, when applied to a short answer, gives us the proposition that corresponds to a full congruent answer.

Example:

(15) Q: *Where will Fritz go?* A1: *To Berlin.*
A2: *To Potsdam..*
etc.

Hence: ‖*Where will Fritz go tomorrow?* ‖
= $\lambda x \in$ PLACE [GO(X)(FRITZ)] (standard function)
= ⟨λx[GO(X)(FRITZ)], PLACE⟩ (function with explicit restriction)

A: ‖*To Berlin.*‖

Q applied to A:
‖*Where will Fritz go tomorrow?*‖(‖*To Berlin.*‖)
= $\lambda x \in$ PLACE [GO(X)(FRITZ)](BERLIN)
= GO(BERLIN)(FRITZ)

A Third Approach: Equivalence Relations / Partitions on Possible Worlds

Groenendijk & Stokhof 1984

- The meaning of a question is a partioning of the possible worlds where each partition corresponds to a complete congruent answer.

Example:

(16) Q: *Where will Fritz go?*
A: *Fritz will go to Berlin (and to no other place).*

Meaning of question as an equivalence relation between possible worlds that determines a partition of possible worlds:

$\|$*Where will Fritz go?* $\|$
$= \lambda w \lambda w'[\lambda x[\textsc{go}(w)(x)(\textsc{fritz})] = \lambda x[\textsc{go}(w')(\textsc{fritz})]], = R$
i.e. w and w′ stand in this relation iff Fritz went to exactly the same places in w as in w′
$\approx \{ X \subseteq W \mid \forall w,w'[w,w' \in X \leftrightarrow R(w)(w')]\}$, a set of mutually exclusive propositions.

We need structured meanings to build this representations,
so this approach should be considered as a subtype of the SM appraoch,
even though it works with a special type of proposition sets.

Mutually exclusive propositions by Exhaustive Cores

Mutually exclusive partitions can be derived from Hamblin meanings of questions by "exhaustive core" formation:

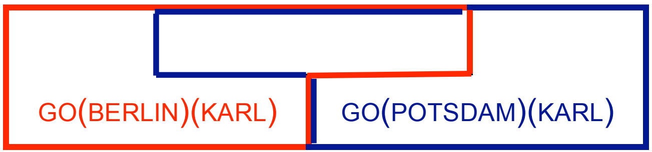
(17) Q: *Where will Karl go?*

Hamblin meaning: $\{\text{GO(BERLIN)(KARL)}, \text{GO(POTSDAM)(KARL)}, ...\}$

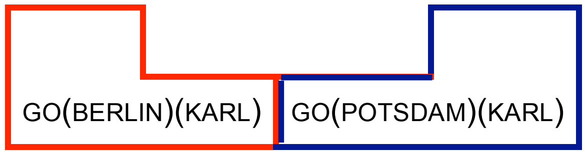
Exhaustive core $\{\forall x[\text{GO}(x)(\text{KARL}) \rightarrow x{=}\text{BERLIN}], \forall x[\text{GO}(x)(\text{KARL}) \rightarrow x{=}\text{POTSDAM}], ...\}$
{'Karl will only go to Berlin', 'Karl will only go to Potsdam')

Formation of Exhaustive Cores:

$$\text{EXH}(\|Q\|): \{p \mid \exists p' [p' \in \|Q\| \ \& \ p = p' - \cup\{p'' \in \|Q\| \mid p'' \neq p'\}]\}$$



‖*Where will Karl go?*‖



EXH(‖*Where will Karl go?*‖)

I will illustrate propositions in question meanings by their exhaustive core.

Relationship between PS approach and SM approach

We can derive PS question meanings from SM question meanings:

(18) *Where will Fritz go?*

SM: $\lambda x \in$ PLACE [GO(x)(FRITZ)], = F

PS: {p | ∃x[F(x)]}
= {GO(BERLIN)(FRITZ), GO(POTSDAM)(FRITZ), GO(MUNICH)(FRITZ), ...}

But we cannot derive SM question meanings from PS question meanings.

The PS question theory is intrinsically less expressive than the SM theory.

Essentially

- the PS theory provides a semantics of wild cards,
  the locus of variation in question meanings is not accessible from outside.
- the SM theory provides a semantics of functions,
  the locus of variation in question meanings is accesible from the outside,
  just apply the function.

A question about linguistic data structures:

- Is the PS theory sufficient to cover all question phenomena,
  or do we need the fulller expressiveness of the SM theory?

Two Theories of Focus

<u>Alternative Semantics (Rooth 1985, 1992)</u>

Focus introduces alternative propositions; two-dimensional interpretation

(19) a. standard meaning:

$$\|\textit{Fritz will go [to BerLIN]}_F\| = \text{GO(BERLIN)(FRITZ)}$$

b. alternative meanings:

$$\|\textit{Fritz will go [to BerLIN]}_F\|_f = \{\text{GO}(x)(\text{FRITZ}) \mid x \in \text{PLACE}\}$$
$$= \{\text{GO(BERLIN)(FRITZ), GO(POTSDAM)(FRITZ), ...}\}$$

(20) a. $\|\textit{[FRITZ]}_F\textit{ will go to Berlin.}\| = \text{GO(BERLIN)(FRITZ)}$

b. $\|\textit{[FRITZ]}_F\textit{ will go to Berlin.}\|_f = \{\text{GO(BERLIN)}(x) \mid x \in \text{ENTITY}\}$
$$= \{\text{GO(BERLIN)(FRITZ), GO(BERLIN)(KARL), ...}\}$$

<u>Structured Meanings (Dahl 1981; v. Stechow 1981, 1990, Jacobs 1984:</u>

Focus induces structuring into background / (alternative set) / focus:

(21) $\|\textit{Fritz will go [to BerLIN]}_F\| = \langle \lambda x[\text{GO}(x)(\text{FRITZ})], \text{PLACE}, \text{BERLIN} \rangle$

(22) $\|\textit{[FRITZ]}_F\textit{ will go to Berlin}\| = \langle \lambda x[\text{GO(BERLIN)}(x)], \text{ENTITY}, \text{FRITZ} \rangle$

Question and Focus Theories: Natural Affinities

- PS Theory of Questions and Alternative Semantics of Focus (Rooth 1992), as both theories assume proposition sets
- SM Theory of Questions and SM Theory of Focus (von Stechow 1990), as both theories assume structured meanings.

We will see:

The PS/Alternative Semantics theory has certain problems
that the SM theory does not have.

PS Theory of Questions and Alternative Semantics for Focus

Rooth's congruence criterion:

- An assertion A is a congruent answer to a question Q iff $\|A\| \in \|Q\|$ and $\|Q\| \subseteq \|A\|_f$

(23) Q: $\|$*Who will go to Berlin?*$\|$ = {GO(BERLIN)(x) | X∈ PERSON}

A: $\|$[*FRITZ*]$_F$ *will go to Berlin.*$\|_f$ = {GO(BERLIN)(x) | X∈ ENTITY}

Congruent answer, as $\|Q\| \subseteq \|A\|_f$

Karl goes to Potsdam	Karl goes to Berlin	Karl goes to Munich
Fritz goes to Potsdam	Fritz goes to Berlin	Fritz goes to Munich
Paul goes to Potsdam	Paul goes to Berlin	Paul goes to Munich

A′: $\|$*Fritz will go* [*to BerLIN*]$_f\|_f$ = {GO(x)(FRITZ) | x∈ PLACE}

Not a congruent answer, as $\|Q\| \not\subseteq \|A'\|_f$

Karl goes to Potsdam	Karl goes to Berlin	Karl goes to Munich
Fritz goes to Potsdam	Fritz goes to Berlin	Fritz goes to Munich
Paul goes to Potsdam	Paul goes to Berlin	Paul goes to Munich

Another answer congruence criterion for Alternative Semantics (Krifka 2001)

Rooth's original criterion did not consider semantic restrictions of the question:

(24) Q: $\|$*What has arrived?*$\|$ $= \{\text{ARRIVE}(x) \mid x \in \text{THING}\}$
*A: $\|$[*FRITZ*]$_F$ *has arrived.*$\|_f$ $= \{\text{ARRIVE}(x) \mid x \in \text{ENTITY}\}$
Predicted to be a congruent answer (!), as $\|Q\| \subseteq \|A\|_f$

And it did not consider contextual restrictions of the question either:

(25) Q: *Who will go to Berlin?* (US cabinet debating a diplomatic mission)
Rumsfeld: **My mother in law will go to Berlin.*

An assertion A is a congruent answer to a question Q iff there is a possible restriction of contextually parametrized sets such that $\#(\|Q\| \cap \|A\|_f) > 1$, where $\|A\| \in \|Q\| \cap \|A\|_f$

(26) Q: $\|$*Who will go to Berlin?*$\|$ $= \{\text{GO}(\text{BERLIN})(x) \mid x \in \text{PERSON}_C\}$
A: $\|$[*FRITZ*]$_F$ *will go to Berlin.*$\|_f$ $= \{\text{GO}(\text{BERLIN})(x) \mid x \in \text{ENTITY}_C\}$
Congruent answer, as $\#(\|Q\| \cap \|A\|_f) > 1$ with $\|A\| \in \|Q\| \cap \|A\|_f$ is possible,

A′: $\|$*Fritz will go* [*to BerLIN*]$_f\|_f$ $= \{\text{GO}(x)(\text{FRITZ}) \mid x \in \text{PLACE}_C\}$
Not a congruent answer, as $\#(\|Q\| \cap \|A\|_f) > 1$ is not possible.

(27) Q: $\|$*What has arrived?*$\|$ $= \{\text{ARRIVE}(x) \mid x \in \text{THING}_C\}$
A: $\|$[*FRITZ*]$_F$ *has arrived.*$\|_f$ $= \{\text{ARRIVE}(x) \mid x \in \text{ENTITY}_C\}$
Not a congruent answer, as $\|A\| \in \|Q\| \cap \|A\|_f$ is not possible

SM Theory of Questions and of Focus

- A question meaning ‖Q‖ = ⟨B, Alt⟩ is congruently answered by an assertion with meaning ‖A‖ = ⟨B′, Alt′, F⟩ iff
  there is a possible restriction of contextually parametrized sets such that:
  a. B′ = B
  b. Alt ⊆ Alt′ (simplest form, refinements possible)

(28) Q: ‖*Who will go to Berlin?*‖ = ⟨λx[GO(BERLIN)(x)], PERSON⟩

A: ‖[*FRITZ*]$_F$ *will go to Berlin.*‖ = ⟨λx[GO(BERLIN)(x)], ENTITY, FRITZ⟩

Congruent answer, as B = B′, the backgrounds are identical,
and PERSON ⊆ ENTITY.

*A′: ‖*Fritz will go* [*to BerLIN*]$_F$ ‖ = ⟨λx[GO(X)(FRITZ)], PLACE⟩

Not a congruent answer, as the backgrounds are not identical,
λx[GO(BERLIN)(x)] ≠ λx[GO(X)(FRITZ)]

A Problem for the PS Theory: Overfocused and Underfocused Answers

<u>A typology of wrong focusation</u>

(29)	Q:	*Where will Karl go?*	
	A:	*Karl will go* [*to BerLIN*]$_F$	Correct focusation.
	*A′:	[*KARL*]$_F$ *will go to Berlin.*	Wrong placement of focus; predicted).
	*A″:	[*KARL*]$_F$ *will go* [*to BerLIN*]$_F$	Overfocused: Too may foci.
	*A‴:	**Karl will go to Berlin.*	Underfocused: Too few foci.
(30)	Q:	*Who will go where?*	
	A:	[*KARL*]$_F$ *will go* [*to BerLIN*]$_F$	Correct focus
	*A′:	*Karl will go* [*to BerLIN*]$_F$	Underfocused: Too few foci.
(31)	Q:	*What will Karl do?*	
	A:	*Karl* [*will drive to BerLIN*]$_F$	Correct focus; accent by ″focus projection″
	*A′:	*Karl* [*will DRIVE*$_F$ *to Berlin*]$_F$	Underfocused: Focus too narrow.
(32)	Q:	*How will Karl go to Berlin?*	
	A:	*Karl will* [*DRIVE*]$_F$ *to Berlin.*	Correct focus
	*A′:	*Karl will* [*drive to BerLIN*]$_F$	Overfocused: Focus too wide.

Question: Are the bad cases properly exluded by condition R: $\|Q\| \subseteq \|A\|_f$?

Excluding underfocused answers:

Example: No focus at all

(33) Q: *Who will go to Berlin?* $\|Q\| = \{\text{GO}(\text{BERLIN})(x) \mid x \in \text{PERSON}_c\}$

*A: *Karl will go to Berlin.* $\|A\|_f = \{\text{GO}(\text{BERLIN})(\text{KARL})\}$

Excluded, as $\|Q\| \not\subseteq \|A\|_f$

Karl goes to Potsdam	Karl goes to Berlin	Karl goes to Munich
Fritz goes to Potsdam	Fritz goes to Berlin	Fritz goes to Munich
Paul goes to Potsdam	Paul goes to Berlin	Paul goes to Munich

Example: Too few foci

(34) Q: *Who went where?* $\|Q\| = \{\text{GO}(x)(y) \mid x \in \text{PLACE}_C,\ y \in \text{PERSON}_C\}$

*A: *KARL*$_F$ *will go to Berlin.* $\|A\|_f = \{\text{GO}(\text{BERLIN})(x) \mid x \in \text{PLACE}_c\}$

Excluded, as $\|Q\| \not\subseteq \|A\|_f$

Karl goes to Potsdam	Karl goes to Berlin	Karl goes to Munich
Fritz goes to Potsdam	Fritz goes to Berlin	Fritz goes to Munich
Paul goes to Potsdam	Paul goes to Berlin	Paul goes to Munich

What about overfocused answers?

Example: Too many foci

(35) Q: *Where will Karl go?* $\|Q\| = \{\text{GO}(x)(\text{KARL}) \mid x \in \text{PLACE}\}$

*A: [*KARL*]$_F$ *will go* [*to BerLIN*]$_F$ $\|A\|_f = \{\text{GO}(x)(y)\ \}\ x \in \text{PLACE},\ y \in \text{ENTITY}\}$

Not excluded, as $\|Q\| \subseteq \|A\|_f$

Karl goes to Potsdam	Karl goes to Berlin	Karl goes to Munich
Fritz goes to Potsdam	Fritz goes to Berlin	Fritz goes to Munich
Paul goes to Potsdam	Paul goes to Berlin	Paul goes to Munich

(36) Q: *How will Karl go to Berlin?* $\|Q\| = \{R(\text{BERLIN})(\text{KARL}) \mid R \in \text{MOVE}_C\}$

$= \{\text{DRIVE}(\text{BERLIN})(\text{KARL}),\ \text{FLY}(\text{BERLIN})(\text{KARL}),\ \ldots\}$

A: *Karl will* [*drive to BerLIN*]$_F$ $\|A\|_f = \{P(\text{KARL}) \mid P \in \text{PROPERTY}\}$

$= \{\text{SING}(\text{KARL}),\ \text{DANCE}(\text{KARL}),$

$\text{DRIVE}(\text{BERLIN})(\text{KARL}),\ \text{FLY}(\text{BERLIN})(\text{KARL}),\ \ldots\}$

Not excluded, as $\|Q\| \subseteq \|A\|_f$

Hence: Overfocusation must be excluded by other principles.

Exclusion of overfocused answers by minimal focus

<u>A Solution? Preference for minimal Focus (Schwarzschild 1999; Büring 2002)</u>

- An answer A is congruent to a question Q iff
  - (i) $\|A\| \in \|Q\|$
  - (ii) $\|Q\| \subseteq \|A\|_F$
  - (iii) There is **no A′ with less focus marking** that satisfies (i) and (ii)

(37) Q: *Where will Karl go?*

A: *Karl will go* [*to BerLIN*]$_F$	Right amount of focus marking
A′: **Karl will go to Berlin.*	Too little focus marking, violates (ii)
A″: **KARL*$_F$ *will go* [*to BerLIN*]$_F$	Too much focus marking, violates (iii)

- Have enough focus marking to mark congruence of the question with the answer
- Use focus marking sparingly, don’t suggest a more comprehensive question.

Formulation in Optimality Theory, with ranked constraints:

EXPRESSCONGRUENCE > AVOIDFOCUS

Why focus marking in the first place?

To indicate Q-A relationship,
in particular to accomodate non-explicit questions in discourse;
using focus minimally helps to indicate more specific question

But what is less focus marking? Example: VP focus

(38) Q: *What will Karl do?* $\{P(\text{KARL}) \mid P \in \text{ACTIVITY}_C\}$

	$\|A\|$	$\|A\|_f$
a. A: *Karl will* [*drive to BerLIN*]$_F$	$\text{DRIVE}(\text{BERLIN})(\text{KARL})$	$\{P(\text{KARL}) \mid P \in \text{PROPERTY}\}$
b. *A: *Karl will drive* [*to BerLIN*]$_F$	(same)	$\{\text{DRIVE}(x)(\text{KARL}) \mid x \in \text{PLACE}\}$
c. *A: *Karl will DRIVE*$_F$ *to Berlin.*	(same)	$\{R(\text{BERLIN})(\text{KARL}) \mid R \in \text{RELATION}\}$
d. *A: [*Karl will drive to BerLIN*]$_F$	(same)	$\{p \mid p \in \text{PROPOSITION}\}$

- All answers satisfy (i), as $\|A\| \in \|Q\|$
- Answers (b), (c) are ruled out by (ii), as $\|Q\| \not\subseteq \|A\|_f$,
- Answer (d) is ruled out by (iii), as answer (a) has less (= smaller) focus marking; .

Hence: **Less** focus marking: Focus marking on a **smaller** constituent,
[U [X Y$_F$] V] has less focus marking than [U [X Y]$_F$ V]

This corresponds to Selkirk's Focus rules, as large focus is generated by focus projection:
Karl will [*drive*$_F$ [*to BerLIN*]$_F$]$_F$

Example multiple constituent questions:

(39) Q: *How will Karl go where?* {R(x)(KARL) | R∈ MOVEMENT, x∈ PLACE}

a. A: *Karl will DRIVE*$_F$ [*to BerLIN*]$_F$ {R(x)(KARL) | R∈ RELATION, x∈ PLACE}

b. *A: *Karl will* [*drive to BerLIN*]$_F$ {P(KARL) | P∈ PROPERTY}

- Both answers satsify (i)
- Both answers satisfy (ii), as $\|Q\| \subseteq \|A\|_f$
- Answer (b) must be ruled out by (iii), i.e. having more smaller foci violates AVOID FOCUS less than having a larger focus.

This corresponds to Selkirk's Focus rules, as (b) is generated by three foci:

Karl will [*drive*$_F$ [*to BerLIN*]$_F$]$_F$

Example multiple constituent answer

(40) Q: *What will Karl do?* $\{P(\text{KARL}) \mid P \in \text{ACTIVITY}\}$

a. A: *Karl will* [*drive to BerLIN*]$_F$ $\{P(\text{KARL}) \mid P \in \text{PROPERTY}\}$

b. *A: *Karl will DRIVE*$_F$ [*to BerLIN*]$_F$ $\{R(x)(\text{KARL}) \mid R \in \text{RELATION}, x \in \text{PLACE}\}$

- Both answers satisfy (i)
- Both answers satisfy (ii), as $\|Q\| \subseteq \|A\|_F$.
  To see this for (b):
  For each $P \in$ ACTIVITY there is a relation R* and a place x*
  such that $\lambda x[P(x)] = \lambda x[R^*(x^*)(x)]$,
  as RELATION is completely unrestricted in Rooth's Alternative Semantics
- Hence answer (b) must be ruled out by (iii),
  but we argued with the last example that (b) is actually preferred over (a),
  as it has less focus!

One way to deal with this problem:

Restrict the potential alternatives for R, x to more specific ones,
following the revised congruence criterion of Krifka (2001),

(But then other problems appear.)

No problem with over / underfocused expressions in Structured Meaning Approach

(41) Q: *What will Karl do?* ⟨λP[P(KARL)], ACTIVITY⟩

A: *Karl will* [*drive to BerLIN*]$_F$. ⟨λP[P(KARL)], PROPERY, DRIVE(BERLIN)⟩

(42) Q: *How will Karl go where?* ⟨λ⟨R,x⟩[R(x)(KARL)], ⟨MOVE, PLACE⟩⟩

A: *Karl will DRIVE*$_F$ [*to BerLIN*]$_F$⟩ ⟨λ⟨R,x⟩[R(x)(KARL)], ⟨RELATION, ENTITY⟩, ⟨DRIVE, BERLIN⟩⟩

Other pairings of Q and A are infelicitous,
as the backgrounds of Q and A would not match up.

Proposition Sets or Structured Meanings?

It appears that the additional expressivity of Structured Meanings is necessary to express question/answer congruence.

For other arguments cf. Krifka (2001):

- Answers to polarity alternative questions, like *Will Karl go to Berlin, or not?*
- Answers to multiple constituent questions, like *Who will go where?*

What is less focus marking? Example:

(43) Q: *How will Karl go to which place?* $\{R(x)(\text{KARL}) \mid R \in \text{MOVE}_C,\ x \in \text{PLACE}_C\}$

	$\lVert A \rVert$	$\lVert A \rVert_f$
a. A: *Karl will DRIVE*$_F$ [*to BerLIN*]$_F$ (*and FLY*$_F$ [*to MUNich*]$_F$)	$\text{DRIVE}(\text{BERLIN})(\text{KARL})$	$\{R(x)(\text{KARL}) \mid R \in \text{MOVE}_C,\ x \in \text{PLACE}_C\}$
b. *A: *Karl will* [*drive to BerLIN*]$_F$	(same)	$\{P(\text{KARL}) \mid P \in \text{ACTIVITY}_c\}$

- All answers satisfy (i) and (ii) as $\lVert A \rVert \in \lVert Q \rVert$ and $\lVert Q \rVert \subseteq \lVert A \rVert_f$, or $\#(\lVert Q \rVert \cap \lVert A \rVert_f) > 1$ can be satisfied
- (b) can be ruled out, if we assume: Broad focus is more strictly avoided than multiple focus.

(44) Q: *What will Karl do?*	$\{P(\text{KARL}) \mid P \in \text{ACTIVITY}_c\}$	
a. A: *Karl will* [*drive to BerLIN*]$_F$	DRIVE(BERLIN)(KARL)	$\{P(\text{KARL}) \mid P \in \text{ACTIVITY}_c\}$
b. *A: *Karl will DRIVE*$_F$ [*to BerLIN*]$_F$ (*and FLY*$_F$ [*to MUNich*]$_F$)	DRIVE(BERLIN)(KARL)	$\{R(x)(\text{KARL}) \mid R \in \text{MOVE}_C, x \in \text{PLACE}_C\}$

- Again, all answers satisfy (i) and (ii) as $\|A\| \in \|Q\|$ and $\|Q\| \subseteq \|A\|_f$, or $\#(\|Q\| \cap \|A\|_f) > 1$ can be satisfied
- Now (b) can be ruled out if we assume: Multiple focus is more strictly avoided than broad focus.

Problems 1 for PS / Alternative Semantics: Polarity Questions

Simple polarity question:

(45) Q: *Will Karl go to Berlin?*

A: *Yes. / No. /*
(Yes), he will. / (No), he won't.
(Yes), he will go to Berlin. / (No), he won't go to Berlin.

Alternative polarity question:

(46) Q: *Will Karl go to Berlin, or not?*

A: **Yes. / *No. /*
(Yes), he will. / (No), he won't.
(Yes), he will go to Berlin. / (No), he won't go to Berlin.

Similar to alternative constituent questions:

(47) Q: *Will Karl go to BerLIN or to POTSdam?*
(≈ *Where will Karl go, to Berlin or to Potsdam?*)

A: **Yes. / *No.*
He will go to Berlin. / He will go to Potsdam.

Alternative questions in the PS approach:

(48) ‖*Will Karl go to BerLIN or to POTSdam?*‖ = {GO(x)(KARL) | x ∈ {BERLIN, POTSDAM}}

Alternative polarity questions in the Ps approach:

(49) ‖*Will Karl go to Berlin, or not?*‖ = {GO(BERLIN)(KARL), ¬GO(BERLIN)(KARL)}

But this is exactly the same meaning the PS approach assigns to simple polarity questions:

(50) ‖*Will Karl go to Berlin?*‖ = {GO(BERLIN)(KARL), ¬GO(BERLIN)(KARL)}

Büring (2002): Have singleton set as meaning of simple polarity questions;
yes affirms the proposition in this set, *no* negates it.

(51) ‖*Will Karl go to Berlin?*‖ = {GO(BERLIN)(KARL)}

Problem: Embedded questions need both possibilites, no difference between simple and alternative polarity questions.

(52) *Paul knows whether Karl will go to Berlin*.
Paul knows whether Karl will go to Berlin or not.

Alternative questions in the the SM approach