Yes-No Questions, Information
Structure, and Prosody

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Outline of Talk

- Introduction
- Information structure of statements.
- Information structure of questions
- Schwarzschild's theory of focus
- Supporting examples from the corpus
- Challenging examples from the corpus
- Conclusion

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Introduction

- Funded by:
  - Social Sciences and Humanities Research Council of Canada grant #410-2007-0345
  - **"The Prosody of Sentence Types and Information Structure in North American English"**

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- Data: CallHome American English Corpus

- Prosodic coding system: ToBI
  - Pitch accents: L*, H*, !H*, L+H*, L*+H
  - Phrase accents: L-, H-
  - Boundary tones: L%, H%

- Prosodic constituency: O'Connor & Arnold 1973
  - Intonational Phrase (IP)
  - Head + Nucleus + Tail

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Sentence Types

- Declarative sentences
  - Prototypically used to make an assertion.
  - But can be used to ask a question.
    - Typically rising rather than falling intonation
    - **You're getting like bunk beds?**
      H*   L*H-H%
- Interrogative sentences
  - Prototypically used to ask a question.
  - But can be used to make an exclamation, or another speech act.
    - Often falling rather than rising intonation (Banuazizi & Cresswell 1999)
    - **Isn't it a pain in the ass when they do that?**
      H*   !H*   L* L-L%

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Information Structure

- Discourse-Pragmatic Approaches
  - Gundel 1985, Gundel & Fretheim 2004 (topic, comment/focus; cognitive status)
  - Lambrecht 1994, Lambrecht & Michaelis 1998 (topic; argument focus, predicate focus, sentence focus)
  - Vallduvi 1990, Vallduvi & Engdahl 1996, Vallduvi & Vilkuna 1998 (background[link; tail], focus; kontrast)
- Semantic Approaches
  - Rooth 1985, 1992 (focus)
  - Krifka 2001, 2006, 2007 (background, focus)
  - Schwarzschild 1999 (given; focus)
  - Büring 2003, 2006 (topic; focus)
  - Steedman 2000, 2007 (theme, rheme; focus)

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Goals of Grant and Present Work

- Integrate discourse-pragmatic and semantic approaches, preserving precision.
- Apply theory to natural discourse (corpus studies).
- First year of grant: explore the meaning of the prosody of questions, starting with positive yes/no questions.
- This paper: prosody and the information structure of positive yes/no questions.

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Information Structure of Statements

Question Test

- Gundel 1974, Reinhart 1982, etc.
- The topic elements of a statement are those elements that are also contained in the eliciting question.

  - JM: In 1980, 125,000 Cubans emigrated to the U.S. in what is known as the Mariel boat-lift. And JImmy CARter emBRACED them.
    [McLaughlin Group, PBS, 11/27/87]
  - Q: What happened with the Cuban emigrés?
    A: Jimmy Carter embraced them.

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Alternative semantics of focus

- Rooth 1992
- the focus semantic value for a phrase of category S is the set of propositions obtainable from the ordinary semantic value by making a substitution in the position corresponding to the focus phrase.

  - $|| [_F Mary]$ likes $Sue||^o = like(m,s)$
  - $|| [_F Mary]$ likes $Sue||^f = \{like(x,s)|x \in E\}$

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Semantics of questions

- Hamblin 1973: the semantic value of a question is the set of its potential answers.
  - $||$ Who likes Sue$?||^o =$
  - $\{like(x,s)| x \in E \wedge person(x)\}$

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Question-Answer Congruence

- The ordinary semantic value of a question is a subset of the focus semantic value of a corresponding answer.

- Who likes Sue? [$_F$MARY] likes Sue.
  $\{like(x,s)|\ x \in E \land person(x)\} \subseteq \{like(x,s)|x \in E\}$

- Who likes Sue? #Mary likes [$_F$SUE].
  $\{like(x,s)|\ x \in E \land person(x)\} \not\subseteq \{like(m,x)|x \in E\}$

Information Structure of Questions

What about the information structure of the question?
Answer 1: Alternative Focus

- One possibility is to conclude that the wh-element in the question is the focus of the question.

- Thus, Lambrecht & Michaelis 1998 cite Ladd 1996 as concluding that it is natural to take this approach.

- Support comes from the fact that the wh-element occurs in preverbal focus position in languages like Hungarian.

- Under this approach the polarity morpheme in a yes-no question would constitute the focus of a yes-no question.

- I will call this element the "alternative focus" of the question.

What about the information structure of the question?
Answer 2: Relational Focus

- Gundel 1974:
  - "It must be noted that this test [the question test] is not sufficient for determining the topic of all types of speech acts. It does not work, for example, with questions….I believe that topic-comment structure is characteristic of all sentences, regardless of illocutionary force."
- Gundel 1988:
  - An entity, E, is the topic of a sentence, S, iff, in using S, the speaker intends to increase the addressee's knowledge about, request information about or otherwise get the addressee to act with respect to E.

- I will call this notion of focus, the "relational focus" of the question.

- It seems to correspond to the element that receives nuclear accent in both statements and questions.

Wh-question example

- 528.16 541.90 B: … But, um, mostly we're we spend most of our time on translation.
  542.34 542.70 A: hm.
  542.57 550.66 B: And, only a very little bit on interpreting. And the interpreting we do is, is a consecutive liaison interpreting.
  551.21 551.79 A: **What does that mean?**
          H*   H*L-L%
  552.50 560.47 B: It means that, um, you, you, actually, it it well you you do it by paragraph.

Alternative focus: {that means by word, that means by sentence, that means by paragraph,…}

Relational focus: "I am talking about the term 'consecutive liaison interpreting', and I'm asking what it means."

Yes-no question example

- 609.35 611.63 B: When did she move in there? Like in June I think.
  611.99 612.34 A: uh-huh.
  613.06 613.61 A: **Is it nice?**
                L*H-H%
  614.08 616.09 B: It's okay, it's kind of gross. Like
  616.11 617.04 A: oh {laugh}
  616.89 618.95 B: There's like roaches all over the place ((and stuff))

- **Alternative focus:** {the house is nice, the house is not nice}

- **Relational focus:** "I am talking about the house, and I am asking whether it is nice.":

Interim Summary

- Lambrecht & Michaelis 1998 take accented items within the body of the wh-question to be topic accents, rather than focus accents.
  - They would presumably extend this analysis to yes-no questions.
- But for Gundel, the nuclear accent in the question marks the relational focus of the question, just as it does in statements.
- In support of my two-types-of-focus idea, Vallduvi & Vilkuna 1998 suggest that the wh-element in a wh-question marks a kontrast, typically contained within a larger rheme (p. 86).

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Plan for Rest of Talk

- How can we make the relational focus of the question intuition more precise?

- What determines nuclear accent placement in yes-no questions?

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Schwarzschild's Theory of Focus

Schwarzschild 1999

- GIVENNESS: A constituent that is not F-marked is given.
- AVOIDF: Do not F-mark.
- FOC: A Foc-marked phrase contains an accent. (A FOC-marked node is an F-node that is not immediately dominated by another F-node.)
- HEADARG: A head is less prominent than its internal argument.

- Ranking of constraints:
  FOC, GIVENNESS >> AVOIDF >> HEADARG.

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- **Definition of GIVEN** (final informal version)
  - An utterance U counts as GIVEN iff it has a salient antecedent A and
    - a. If U is of type e, then A and U corefer;
    - b. Otherwise, modulo ∃-type shifting, A entails the Existential F-Closure of U.

- ∃-type shifting:
  - An operation that raises antecedent expressions to type t, by existentially binding unfilled arguments.

- Existential F-closure of U:
  - The result of replacing F-marked phrases in U with variables and existentially closing the result, modulo existential type shifting.

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Example

- {John ate a green apple.}
  And [BILL]$_F$ ate a [RED]$_F$ apple.

- The VP is given because
  - The ∃-type shift of the antecedent VP is
    (i) ∃x[x ate a green apple]
  - The existential F-closure of U is
    (ii) ∃x∃Y[x ate a Y apple]
  - And (i) entails (ii).

- AVOIDF prevents further F-marking, while GIVENNESS prevents the omission of the F on *Bill* and *red*.

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- "The theory proposed here for how to account for F-marking in answers extends to the F-marking in interrogatives. (p.162)"

- {I bought a watch for my younger sister} What did you buy for your [OLDer]$_F$ sister?

  The existential closure of a wh-question is derived by replacing the wh-word with an existentially bound variable.

- The interrogative is given because [A bought a watch for A's younger sister] entails $\exists X \exists y$[A bought y for A's X sister]

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- (i) Did [JOHN]$_F$ leave?
- (ii) Did John [LEAVE]$_F$?

- The existential F-closure of a positive yes-no question is the positive contained proposition with F-marked constituents replaced by existentially-bound variables.

- (i) requires an antecedent that entails $\exists x$[x left], e.g. "Who left?" or "Someone left."
- (ii) requires an antecedent that entails $\exists X$[X(John)], e.g. "What did John do?" or "John did something."

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Supporting Examples from the Corpus

Examples from the Corpus

- Yes-no questions with post-nuclear tails.
- Material after the nucleus is deaccented and thus should be 'given', part of the topic.

- **Has, has <u>Kim</u> been here before**?
  L*HH%

- **Can you <u>get</u> me a connecting flight?**
  L+H*LL%

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- **4093-B-01**
  1186.35 1188.21 A: <u>Actually I've, I've been up to Holland before</u>.
  1188.50 1189.75 A: Spent about two weeks up [distortion] there.
  1189.07 1189.63 B: {breath} yeah.
  1190.42 1192.88 A: So um, but that was years and years ago.
  1193.76 1195.80 B: With your parents when your father was stationed over here, right?
  1196.24 1201.52 A: yeah. But we, we got to see Den Haag and places like that too which we're obviously not going to see this time.
  1203.06 1203.89 A: But um
  1207.02 1208.44 B: **Has, has [KIM]$_F$ been here before**?
          L*HH%
  1207.06 1207.54 A: And, an-
  1208.65 1208.98 A: No.

- I'm talking about who has been here in Holland before, and I'm asking if <u>Kim</u> has.
- [I've been to Holland before] entails $\exists x$[x has been to Holland before]

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- **4104-A-01**
  215.89 218.17 A: {sniff} oh this is a flight to London?
  218.86 219.43 B: Right.
  219.82 220.26 A: I see.
  220.12 224.42 B: Right. And then uh <u>just get the uh connecting flight</u>.
  224.61 226.20 A: **Can [you [[GET]$_F$ me a connecting flight]$_F$]$_F$**?
          L+H* L-L%
  227.20 229.00 B: Well that shouldn't be a problem.
  228.81 231.04 A: Susan said there's no inter-Europe flights.
  231.80 233.41 B: Right. [[says laughing]] Right. [[says laughing]]
  234.01 236.50 B: {breath} No, I can go down to the place here and
  236.98 238.44 A: {laugh}
  237.34 239.70 B: (( )) Sure. Sure.
  240.43 243.71 B: uh uh nothing's uh uh possible with Susan.
  244.11 244.67 A: {laugh}
  244.55 249.44 B: No, everybody [distorted] who doesn't have a ticket a month ago is not going to fly for the rest of the year.

- I'm talking about me and a connecting flight, and I'm asking if <u>you can get (reserve)</u> me one.
- [A should get (take) the connecting flight] entails $\exists X$[X(A, a connecting flight)]

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Challenging Examples from the Corpus

Problem 1: Negative Antecedents

- **4093-B-02**
  1212.11 1217.66 A: But then again I'm, I'm not sure that Kim would be interested in seeing Shape Headquarters and you know all that kind of stuff.
  1218.53 1220.77 B: {laugh}
  1220.89 1221.77 A: those military things.
  1224.54 1227.61 B: {inhale} **Would [YOU]$_F$ be interested in**
  L*H-H%
  seeing, s- seeing Shape Headquarters again.
  1227.98 1229.50 A: No. Not really. {laugh}
  1231.17 1236.74 B: {laugh} yeah. I di-, I didn't think so. Somehow I had this feeling that th-, th-, the military taste had been beaten out of you.
  1236.70 1239.41 A: {laugh} yep.

- I'm talking about people being interested in seeing Shape Headquarters, and I'm asking if you would be interested in seeing it.

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- Need to entail the Existential F-closure of the question:
  ∃x[x would be interested in seeing Shape Headquarters]

- Apparent antecedent:
  Kim would not be interested in seeing Shape Headquarters.

- Could try to quantify over polarity:

  ∃**P**[Kim will **P** be interested in seeing Shape Headquarters]

- But in possible worlds semantics, this result of ∃-type-shifting the antecedent is a tautology and thus can only entail other tautologies.

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- **Possible Solution 1**: Schwarzschild, p. 148: "An expression could be given even if it is not entailed by the entire prior discourse."

  – {If John ate a green apple, he will lose the contest.} Don't WORRY, he ate a RED apple.
    - Antecedent entails the existential F-closure of U:
      ∃X[John ate an X apple]

  – {Kim would not be interested in seeing Shape Headquarters} Would YOU be interested in seeing Shape Headquarters?
    - If we ignore negation in determining the antecedent, then the resulting antecedent, [Kim would be interested in seeing Shape Headquarters], entails the existential F-closure of U:
      ∃x[x would be interested in seeing Shape Headquarters]

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- In talking of the ∃-type shift of a wh-question, Schwarzschild says:
  – "the results of this section do not imply that interrogatives carry existential presuppositions. The only claim made here is that for the purposes of GIVENNESS, interrogatives create contexts similar to those created by existential statements." (p. 157).
- Perhaps the same thing can be said about negative sentences.

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- Horn 1989 cites Givon 1978 as actually proposing that negative sentences logically presuppose their positive counterparts.
- Horn (p. 198) rejects the presupposition analysis, but does conclude in favor of a "markedness implicature", which could be derived from the idea that "There should be a reason to utter a sentence, and, for a negative sentence, that reason…is generally the earlier consideration of its contained affirmative counterpart" (Horn 1978: 203)
- Horn 1989 concludes that this previous consideration holds in prototypical uses of negative statements.
- Thus, the positive "givenness supposition" associated with contextual negatives can perhaps be construed as a conversational implicature.

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Possible Solution 2 to Problem of Negative Antecedents

- Antecedent is just the VP:
  - Kim would not be interested in seeing Shape Headquarters.
- Existential type shift of the antecedent:
  - (i) ∃x[x be interested in seeing Shape Headquarters]
- Utterance:
  - "Would [YOU]$_F$ be interested in seeing Shape Headquarters?"
- Possible existential closure of the utterance:
  - (ii) ∃x[x be interested in seeing Shape Headquarters]
  - (i) entails (ii).

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Problem 2: Presence of Antecedent Doesn't Dictate F-Marking

- **4157-A-01**
  182.18 183.46 A: I miss it so much
  183.83 184.40 B: do you
  183.78 184.97 A: **do you   [MISS]$_F$ it [NOW]$_F$** ?
                L*+H   L*H-H%
  184.99 186.37 B: {breath} no not at all
  186.24 187.07 A: You don't {laughing}
  186.97 187.55 B: No
  187.68 190.97 A: {breath} I guess you lived there long enough to get it all out of your system {breath}

- NO: I'm talking about who misses Spain now, and I'm asking if you miss it now.
- YES: I'm talking about how you have felt about Spain at certain times, and I'm asking if you miss it now.

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- Immediate antecedent: I miss it so much [now].

- Immediate antecedent entails: (i) ∃x[x misses Spain now]
  (ii) ∃x∃Y [x Y Spain now]
  (iii) ∃x∃Y∃t [x Y Spain at time t]
  AvoidF will prefer (i)

- Understood proposition from prior discourse provides the antecedents of the question:

- {I did not miss Spain at t}
  Do you [MISS]$_F$ it [NOW]$_F$?

- The subject "you" is given because it is coreferential with "I".
- The VP is given because the type-shift of the antecedent VP, ∃x[x missed Spain at t, entails the F-closure of the type-shift of the VP in the question, ∃t'∃x[x miss Spain at t']
- Why "MISS" is accented remains a mystery.

- Schwarzschild, p. 151: "a speaker could insinuate an antecedent, provided the hearer can accommodate it."

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Conclusion

- Gundel's discourse-pragmatic relational theory of focus works quite well to explain the distribution of nuclear accent in the body of yes-no questions.
- Schwarzschild's formal semantic theory of focus also can explain the distribution of nuclear accent in yes-no questions.
- Confronting formal semantic theories, as well as discourse-pragmatic theories, with natural data is enlightening.

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