Sentence Prosody:
Intonation, Stress, and Phrasing
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Overview

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- The Grammar of Intonation

- Intonational Phrasing

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Introduction

- Sentence prosody encompasses intonation, phrasal rhythmic patterning, and prosodic phrasing.
- Article examines the relations between these aspects of sentence prosody and the relation of sentence prosody to the meaning of the sentence.

- Main claims for English:
  - Distribution of pitch accents constrains focus structure of the sentence, which constrains possible meanings
  - Distribution of pitch accents constrains rhythmic stress patterns of the sentence
  - Intonation—not the phrasal stress pattern—mediates the meaning-sentence prosody relation

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The Grammar of Intonation

- Presence of a pitch accent implies that the word is focused: different distributions of pitch accents imply different focus structures.
- A *wh-* expression focuses a constituent; an appropriate answer focuses the same constituent.
- Focus = "the focus of the sentence"; it introduces a set of alternatives into the discourse
- A constituent that answers a *wh-* question is F-marked.

- The central problem in the characterization of the prosody-focus relation is *focus projection*:
  - What principles govern the relation between pitch accent and F-marking?

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The Grammar of Intonation

- Chomsky and Halle's Nuclear Stress Rule (NSR):
  - Main stress = rightmost word-level stress of a phrase
  - Pitch accent is on main stress within F-marked constituent
  - $[.....\sigma_{main\ stress}.....]_F \rightarrow [..... \sigma_{main\ stress}.....]_F$
    $|$
    pitch accent

- NSR does not predict the correct location of pitch accent within a focused constituent.
- Selkirk proposes argument-structure-based account of focus projection.

The Grammar of Intonation

- Basic Focus Rule:
  - An accented word is F-marked.

- Focus Projection:
  - (a) F-marking of the *head* of a phrase licenses the F-marking of the phrase.
  - (b) F-marking of an *internal argument* of the head licenses the F-marking of the head.
  - (c) F-marking of a constituent licenses F-marking of its *trace*.

- Focus of the sentence (FOC or Focus):
  - F-marked constituent not dominated by another F-marked constituent.

The Grammar of Intonation

- Basic Focus Rule:
  - Accent → F-marking

- Focus Projection:
  - (a) (F-marking of *head* of phrase → F-marking of phrase) ∨
    (F-marking of *head* of phrase → ¬F-marking of phrase)

  - (b) (F-marking of *internal argument* of head → F-marking of head) ∨
    (F-marking of *internal argument* of head → ¬F-marking of head)

  - (c) (F-marking of constituent → F-marking of its *trace*) ∨
    (F-marking of constituent → ¬F-marking of its *trace*)

The Grammar of Intonation

Examples:

Mary bought a book about [BATS]$_F$.
(What did Mary buy a book about?)
Mary bought a book [about BATS]$_F$.
(What kind of book did Mary buy?)
Mary bought [a book about BATS]$_F$.
(What did Mary buy?)
Mary [bought a book about BATS]$_F$.
(What did Mary do?)
[Mary bought a book about BATS]$_F$.
(What's been happening?)

The Grammar of Intonation

Examples following Selkirk:

Mary bought a book about $_{FOC}[[BATS]_F]_{FOC}$.

Mary bought a book $_{FOC}[[about]_F\ [[BATS]_F]_F]_{FOC}$.

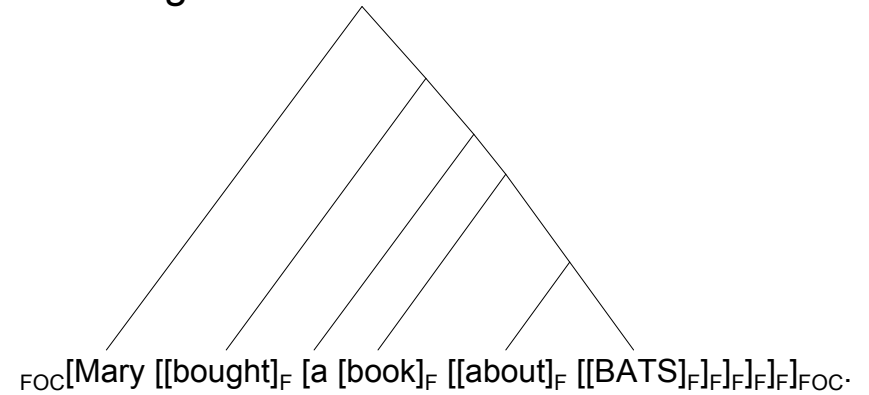Mary bought $_{FOC}[a\ [book]_F\ [[about]_F\ [[BATS]_F]_F]_F]_{FOC}$.

Mary $_{FOC}[[bought]_F\ [a\ [book]_F\ [[about]_F\ [[BATS]_F]_F]_F]_F]_{FOC}$.

$_{FOC}[Mary\ [[bought]_F\ [a\ [book]_F\ [[about]_F\ [[BATS]_F]_F]_F]_F]_F]_{FOC}$.

The Grammar of Intonation

How to get sentence FOC:

$_{FOC}[Mary\ [[bought]_F\ [a\ [book]_F\ [[about]_F\ [[BATS]_F]_F]_F]_F]_F]_{FOC}$.

(by Focus Projection (a))

The Grammar of Intonation

- Selkirk's theory differs from NSR in its ability to account for:
  - the relation between accent and the given-new structure of the sentence.
  - the lack of focus projection from accents in positions where main phrase stress would be predicted.
  - the projection of focus from accents in positions not defined as main phrase stress.

How to interpret Selkirk's machinery:
- F-marked constituents which are not FOC are *new*.
- Constituents without F-marking are *given*.
- The FOC constituent is *given* or *new*.

The Grammar of Intonation

Examples of *new* and *given* constituents:

What's been happening?
$_{FOC}[Mary\ [[bought]_F\ [a\ [book]_F\ [[about]_F\ [[BATS]_F]_F]_F]_F]_F]_{FOC}$.
→ Mary must be given

Who bought a book about bats?
$_{FOC}[[MARY]_F]_{FOC}$ bought a book about bats.
→ Mary can be given or new

What's been happening?
$_{FOC}[[MARY]_F\ [[bought]_F\ [a\ [book]_F\ [[about]_F\ [[BATS]_F]_F]_F]_F]_F]_{FOC}$.
→ Mary must be new

The Grammar of Intonation

The theory correctly predicts:

The "deaccenting" puzzle:
$_{FOC}$[[[MARY]$_F$]$_F$ [[bought]$_F$ [a [BOOK]$_F$ [[about] [[bats]]]]$_F$]$_F$]$_{FOC}$.

Sentence focus with accented auxiliary:
$_{FOC}$[[Mary] [[DID]$_F$ [buy a book about bats]]$_F$]$_{FOC}$.

Adjunt phrases in post-head position don't project:
He only smoked $_{FOC}$[in the TENT]$_{FOC}$.
*He only $_{FOC}$[smoked in the TENT]$_{FOC}$.
He only $_{FOC}$[SMOKED in the TENT]$_{FOC}$.
cf. He only $_{FOC}$[looked at the GARDEN]$_{FOC}$. (post verbal PP is argument)

The Grammar of Intonation

The theory correctly predicts (cont.):

$_{FOC}$[[[JOHN]$_{F1}$]$_{F2}$ $_{VP}$[[t]$_{F3}$ [died]$_{F4}$]$_{F5}$]$_{FOC}$. (can be BF)
$_{FOC}$[I heard [[a [CLOCK]$_F$]$_F$ $_{VP}$[[t]$_F$ [tick]$_F$]$_F$]$_F$]$_{FOC}$. (can be BF)
$_{FOC}$[I forced $_{FOC}$[the [CLOCK]$_F$]$_{FOC}$ to $_{VP}$[PRO [tick]]]. (cannot be BF)

Sentence focus for event reading vs. generic reading:
Event reading: subject raised from deep structure position within VP
$_{FOC}$[TRESpassers will be prosecuted]$_{FOC}$
Generic reading: surface subject controls VP-internal PRO
$_{FOC}$[TRESpassers will be PROsecuted]$_{FOC}$

The Grammar of Intonation

The theory correctly predicts (cont.):

Sentence focus for individual level vs. stage-level predicate:
Stage level: subject raised from deep structure position within VP
$_{FOC}$[Your EYES are red]$_{FOC}$ (red is stage-level when predicated of eyes)
$_{FOC}$[Your EYES are RED]$_{FOC}$
Individual level: surface subject controls VP-internal PRO
*$_{FOC}$[Your EYES are blue]$_{FOC}$
$_{FOC}$[Your EYES are BLUE]$_{FOC}$

Intonational Phrasing

*   Phrasing, but not metrical information, is important for a fuller understanding of the relation between sentence prosody, meaning and discourse.
*   Phrasing is related to notions of Topic and Focus.

*   Examples:
    (a) $_{IP}$(Three mathematicians in ten)$_{IP}$ $_{IP}$(derive a lemma)$_{IP}$.
    (a) *$_{IP}$(Three mathematicians)$_{IP}$ $_{IP}$(in ten derive a lemma)$_{IP}$.
    (a) $_{IP}$(Three mathematicians)$_{IP}$ $_{IP}$(intend to rival Emma)$_{IP}$.

On the Limits of Focus Projection in English
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Overview

- Introduction
- Restricted View of Focus Projection
- Obligatory Prenuclear Pitch Accents
- Extended Focus Projection
- The Restricted View: Discontinuous Focus
- Two Arguments for Extended Focus Projection Refuted
- "Restricted" Focus Projection in Complex Sentences

Introduction

- Radical Focus-To-Accent view:
  - Bolinger: there is no focus projection beyond the word the pitch accent is placed on.

- Restricted focus projection:
  - Schmerling / Fuchs / Gussenhoven / Ladd / Baart: arguments *can* project focus to adjacent predicates

- Extended focus projection:
  - Schmerling / Selkirk / Steedman: allows for focus to project upward to larger constituents and ultimately to the sentence

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Introduction

- Gussenhoven's objections to Selkirk:

  - Extended view of focus projection leads to the presence of old information inside the focus constituent. This leads to too much machinery since both focus projection rules and interpretation rules are needed.

  - Restricted view of focus projection is conceptually simpler.

  - Extended view of focus projection faces empirical difficulties.

Restricted View of Focus Projection

- Sentence Accent Assignment Rule (SAAR):

  - Every focused argument (A), modifier (M), and predicate (P) is accented, with the exception of a predicate that is adjacent to one of its arguments.

  - Accents are abstract placeholders, marking locations that will be filled with a pitch accent if they survive the actions of various deletion rules.

Restricted View of Focus Projection

- Deletion rules (focus projection rules):
  - Deaccent every **A**, **P**, and **M** outside the focus cpnstituent.
  - Deaccent a focused **P** that is adjacent—disregarding any intervening nonfocused **A** or **M**—to an accented **A**.

- Prefocal pitch accents:
  - Assign pitch accents to the constituents before the nuclear pitch accent. (Optional)

Obligatory Prenuclear Pitch Accents

- Gussenhoven disagrees with the belief that a full-focus version of a sentence is always equivalent to a narrow focus version with the focus on the last pitch accented word.
- Instead he suggests:
  - (a) What's John tickling Mary with?
    John's tickling Mary with a FEATHER.
  - (b) What's going on?
    *John's tickling Mary with a FEATHER.
  - (c) What's John tickling Mary with?
    JOHN's tickling MARY with a FEATHER.
  - (d) What's going on?
    JOHN's tickling MARY with a FEATHER.

Extended Focus Projection

- Objection to Selkirks's assumption that FOC should be a constituent:

Example:
- What did she do with the book?
  [She [[sent]$_F$ a book [to [MARY]$_F$]$_F$]$_F$]$_{Foc}$.

Following to Selkirk, we get:
- Focus: *She sent a book to Mary.*
- New: *sent a book to Mary, sent, to Mary, Mary*
- Given: *She, a book*
- Given or New: *She sent a book to Mary*

Extended Focus Projection

Other counterexamples:

- [She [[SENT]$_F$ a book to Mary]$_F$]$_{Foc}$.

  Selkirk's theory suggests that the VP *sent a book to Mary* can be interpreted as new. But the context: "What did she do?" is inappropriate.

- What happened?

  (a) $_{FOC}$[[[JOHNSON]$_F$]$_F$ [[t]$_F$ [died]$_F$]$_F$]$_{FOC}$.
  (b) MARY bought a book about bats.

  Selkirk's theory does not explain why (b) is not a possible reply to "*What happened?*" Why would (a) have a trace and not (b)?

The Restricted View: Discontinuous Focus

Gussenhoven's account of previous example:

- What did she do with the book?

  [She [[sent]$_F$ a book [to [MARY]$_F$]$_F$]$_F$]$_{Foc}$.

- By focus projection rules, either *(to) Mary* or *sent to Mary* is [+focus]
- Example shows that focus can be discontinuous.
- The notion of *discontinuous focus* should be distinguished from the notion of *multiple foci*.

The Restricted View: Discontinuous Focus

Minimal pair of discontinuous focus / multiple foci:

- Was hat das Kind erlebt?

  KARL hat dem Kind einen FÜLLER geschenkt.

  [Karl…einen Füller geschenkt]$_{FOC}$

- Wer hat was hinsichtlich des Kindes getan?

  KARL hat dem Kind einen FÜLLER geschenkt.

  [Karl]$_{FOC}$ [einen Füller geschenkt]$_{FOC}$ (cf. Höhle 1982)
  (FOC here not Selkirk's FOC)

The Restricted View: Discontinuous Focus

- In restricted focus projection theories, the need for a separate set of focus interpretation rules never arises.

- Focus projection principles should in themselves suffice to identify the focused (*new*) status of the constituents in a sentence.

- *Restricted Focus Projection:*
  Pitch Accent distribution ↔ Focus distribution
- *Extended Focus Projection:*
  Pitch Accent distribution ↔ Focus distribution ↔ Focus interpretation

Two Arguments for Extended Focus Projection Refuted

- Selkirk's example of sentence focus with accented auxiliary:

  FOC[[Mary] [[DID]F [buy a book about bats]]F]FOC.

- Gussenhoven suggests that there is no need to assume sentence focus.
- This could be a reply to the implied question:

  Which of the information contained in *NEG,PAST[Mary buy a book about bats]* is incorrect?

- *NEG* is taken as the focus ("counterassertive focus", which needs to be distinguished from "counterpresuppositional focus")

Two Arguments for Extended Focus Projection Refuted

- Selkirk's example:

  I was only thinking that FOC[MARY bought a BOOK about bats]FOC. (*only* dominates embedded S, therefore S must be focus)

- Counterexamples:
- Were you thinking that they might catch a cold or what?
  I was only thinking FOC[that they wouldn't fit into the PHONE booth]FOC.
- Were you perhaps thinking that they wouldn't fit into the spare bedroom?
  I was only thinking that they wouldn't fit FOC[into the PHONE booth]FOC.

"Restricted" Focus Projection in Complex Sentences

- What's going on with him?

  (to look OUT)$_{Pred}$ (for a MANiac)$_{Arg}$

  out   *1. cycle*

  (was WARNED)$_{Pred}$ (to look out for a MANiac)$_{Arg}$

  warned   *2. cycle*

  He [was warned to look out for a MANiac]$_{FOC}$.   *Output*

"Restricted" Focus Projection in Complex Sentences

- Why weren't you admitted to the Poets' Club?

  (a BIRD)$_{Arg}$ (SING)$_{Pred}$

  sing   *1. cycle*

  (to HEAR)$_{Pred}$ (a BIRD sing)$_{Arg}$

  hear   *2. cycle*

  (FAILED)$_{Pred}$ (to hear a BIRD sing)$_{Arg}$

  failed   *3. cycle*

  I [failed to hear a BIRD sing]$_{FOC}$.