Comparing German and Swedish intonation from a functional perspective

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Background

- General assumption: Swedish has a ***restricted utterance prosody*** (as compared to, e.g., German)
  - Because of the word accents

- Reflected in contemporary phonological models
  - example

- But are the models...
  - ... adequate?
  - ... equivalent?

Table 1. Accents and final boundary tones (b.t.) in GToBI for German (Grice et al. 2005) and the Lund model for Swedish (Bruce 1998; 2005).

function	Standard German *accents*	*b. t.*	Standard Swedish *accents*	*b. t.*
lexical			H+L* H*+L	
non-lexical	H* L+H* L* L*+H H+L* H+!H*	L- H- L-% L-H% H-% H-^H%	H-	L% LH%

General hypothesis and aim

- German and Swedish utterance prosody have more in common than generally assumed.
  - Different pre-conditions and research traditions → contemporary models not comparable

- Aim: a systematic comparison of (aspects of) German and Swedish utterance prosody
  - functional approach (cf. Yi Xu and colleagues)
    - How are specific communicative functions signalled acoustically?
    - How are several of them encoded in parallel?

Which functions?

- speech act ('purpose of the utterance')
  - assertion, confirmation, correction, perception question, request call ...
- information structure category
  - single narrow focus (different positions), double focus, contrastive topic + focus
    - **Focus = 'important information', or 'discourse-related highlighting of constituents'**
- lexical prosody (Swedish word accent)

Two production studies

- *'request calls'* in German and Swedish
  - *Ambrazaitis (2008): On final rises and fall-rises in German and Swedish. Proc. FONETIK, June 11-13, 2008, Gothenburg.*

- *'confirmations'* vs. *'assertions',* and *'narrow focus',* in Swedish (and German)
  - *Ambrazaitis (in prep.): The intonational signalling of 'confirmation' in Swedish and German. Accepted to NORDIC PROSODY X, August 4-6, 2008, Helsinki.*

General method

- elicitation of communicative functions by means of context descriptions and/or context questions

- recordings in pseudo dialogues
  - human-human (Ambrazaitis, 2007)
  - human-machine (pre-recorded questions)
    - BAS Speechrecorder software (Munich)
    - 5 repetitions per test condition

Study 1

Study 1 (request calls): background

- *"**Wallander?** Skulle jag kunna få be dig om en tjänst?"*
- a kind of 'polite question'?

HYPOTHESIS
Frequency code (Ohala, 1984)
→ rising intonation

- *'nuclear' intonation patterns:*
  - German (e.g., Féry, 1993):
    - falls H* L L* H L
    - rise L* H
    - fall-rise H* L H%

Final rises associated with polite questions (Kohler, 2005) and continuation (Dombrowski & Niebuhr, 2005)

  - Swedish (Lund model, e.g., Bruce, 2005):
    - fall ... H- L%
    - fall-rise ... H- LH%

Final rises usually not associated with questions (Gårding 1979), but with continuation (Gussenhoven, 2004)

Study 1 (request calls): method

- subjects:
  - German: 9 (6 female, 3 male)
  - Swedish: 7 (4 female, 3 male)
- test material/ test utterance:
  - *"Wallander? Dürfte ich Sie um einen Gefallen bitten?"*
  - *"Wallander? Skulle jag kunna få be dig om en tjänst?"*
- 5 repetitions → 80 tokens of *"Wallander?"*
  - 45 by Germans
  - 35 by Swedes

Study 1 (request calls): results 1

- 'manual' classification of intonation pattern

Table 2. Distribution of nuclear intonation patterns by Swedish and German speakers. N = absolute number of items; Speak. = speakers who (at least once) produced a pattern; the first letter in speaker label indicates sex (M = male; F = female).

	German			Swedish		
	%	N	Speak.	%	N	Speak.
Fall	13.3	6	Mmk; Mas	17.1	6	Fss; Mnh
Fall-rise	17.8	8	Fjd; Fll: Fcf	42.9	15	Fkb; Fcw; Mmr
Rise	66.7	30	Fib; Fjd; Fkm; Fmt; Fcf; Mms; Mas	25.7	9	Mmu; Mnh
Unclear	2.2	1	Fll	2.9	1	Fek
Other	0.0	0	-	11.4	4	Fek
Sum	100	45	9	100	35	7

Table 3. Number of German and Swedish speakers who preferred either a rise or a fall-rise.

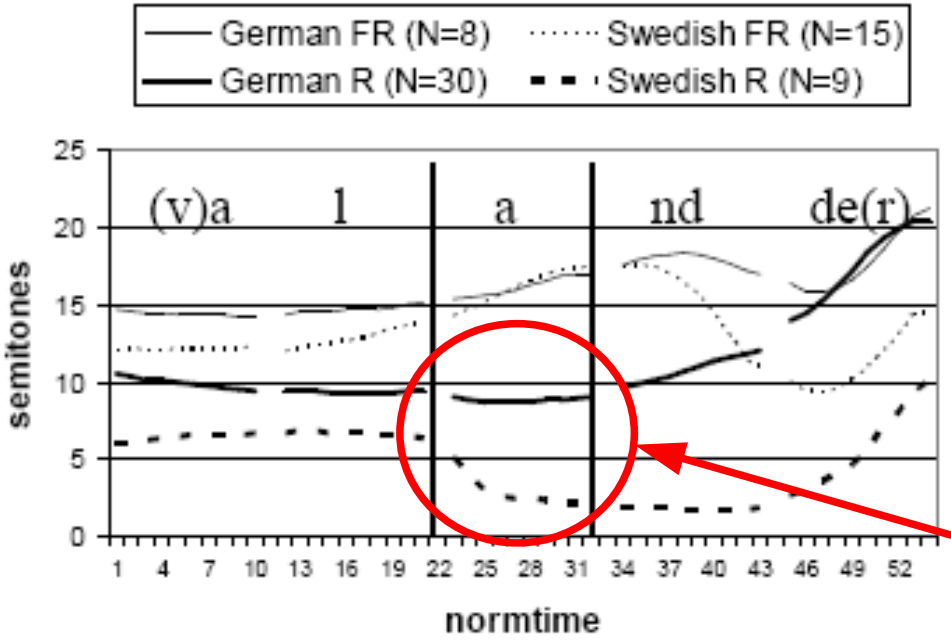
	German	Swedish	sum
'Fall-rise speakers'	*2*	*3*	**5**
'Rise speakers'	*6*	*2*	**8**
Sum	**8**	**5**	**13**

Fisher's exact test: p=.2494

no significant interaction between language and preference for either rise or fall-rise

Study 1 (request calls): results 2

- semi-automatic extraction of time-normalized mean F0 contours (10 data points/ segment)



- fall-rises: relative height of end point
  - ... higher than accent peak in German
  - ... lower than accent peak in Swedish
- rises:
  - German: L L H
  - Swedish: H L H

semitones, reference 100 Hz
speakers merged: German FR: female only
German R: female & male
Swedish FR: female & male
Swedish R: male only

Study 1: summary / discussion

- ***global similarity*** between German and Swedish in the expression of a 'request call'
  - 2(-3) strategies: rise, fall-rise, (fall)
    - in line with the frequency code (Ohala, 1984)
    - not captured by the Lund model for Swedish (yet)

- ***local difference(s)*** between German and Swedish realizations:
  - step down from pre-stress to stressed syllable
    - in line with Lund model: 'accent I' is H+L*

Study 2

Study 2 (confirmation & focus): background

- *Common perspectives on utterance intonation research*
  - Form → function
    - Traditionally more usual in German than in Swedish intonation research
  - Function → form, one-dimensional
    - Traditionally the main perspective in Swedish intonation research
- Problem: several types of utterance functions are expressed simultaneously.
- This study:
  - Function → form, two-dimensional
    - Speech act
    - Focus position

Study 2 (confirmation & focus): method

- context description
  - *Du är polis och träffar en gammal kollega. Ni pratar om pensioneringen och om möjligheten att förlänga sin tjänst.*
  - *Du bist Polizist und triffst einen alten Kollegen. Ihr redet über die Pensionierung und die Möglichkeit, seinen Dienst zu verlängern.*
- context question (see next slide)
- test sentence:
  - *"Wallander förlänger till november."*
  - *"Wallander verlängert bis November."*

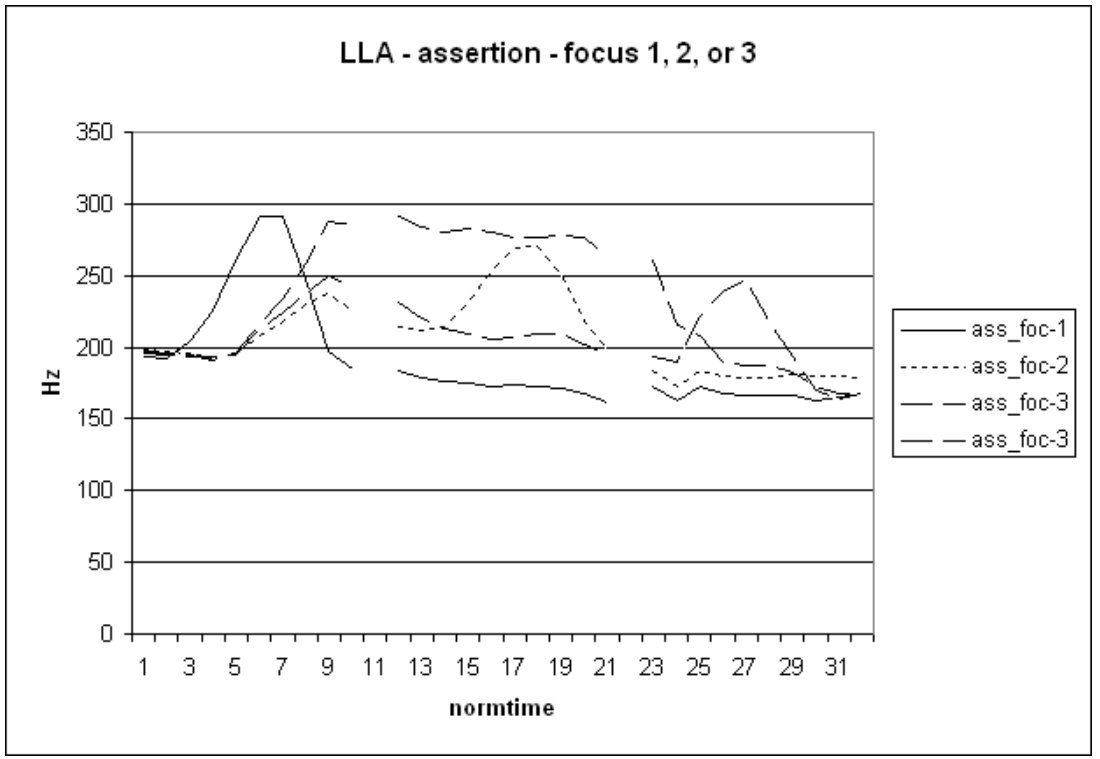
Study 2 (confirmation & focus): method

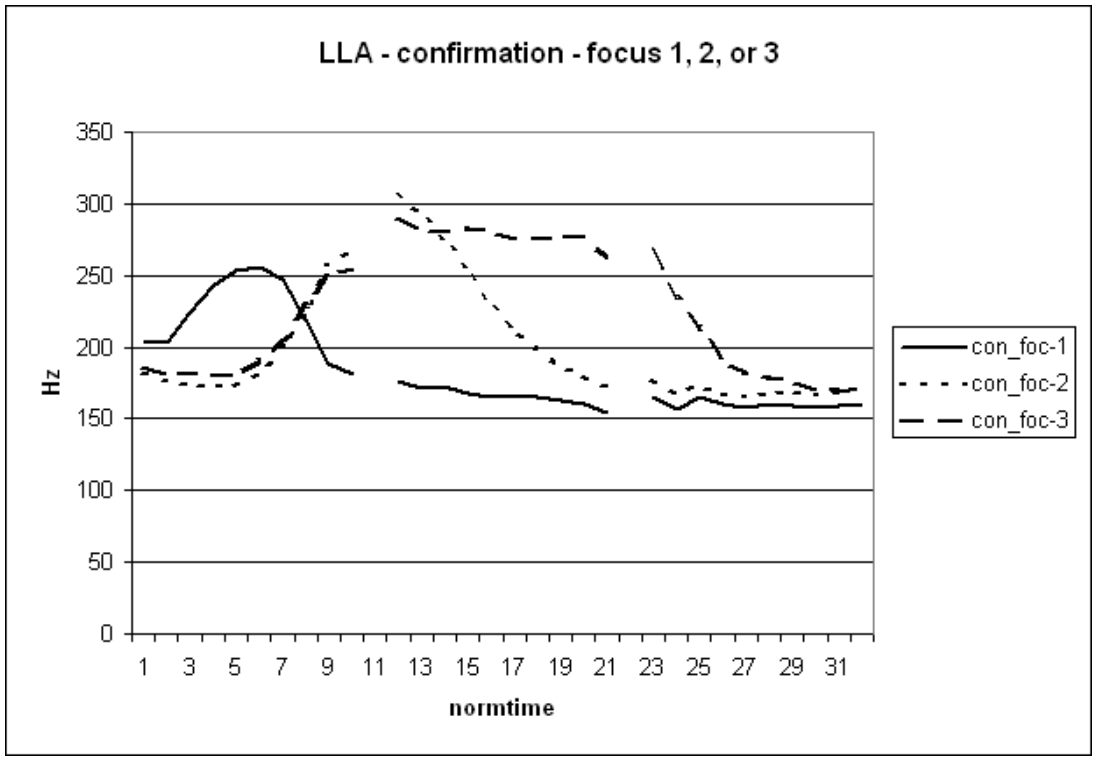
- Context questions in assertions / confirmations:
  - Focus on “Wallander” (position 1):
    - Und wer verlängert bis November?
    - Aber wer verlängert denn bis November? Das war doch Wallander, oder?
  - Focus on “förlänger/ verlängert” (position 2):
    - Vad är det då som Wallander gör fram till November?
    - Vad är det då som Wallander gör fram till November? Han förlänger väl, eller?
  - Focus on “november” (position 3):
    - Och fram till när förlänger Wallander?
    - Fram till när förlänger Wallander egentligen? Till november, eller?

Study 2 (confirmation & focus): method

- subjects (so far):
  - German: 1 (female)
  - Swedish: 4 (2 female, 2 male)
- 2 (speech act) x 3 (focus) = 6 conditions
- 5 repetitions → 30 utterances per speaker

Study 2 (confirmation & focus): some results

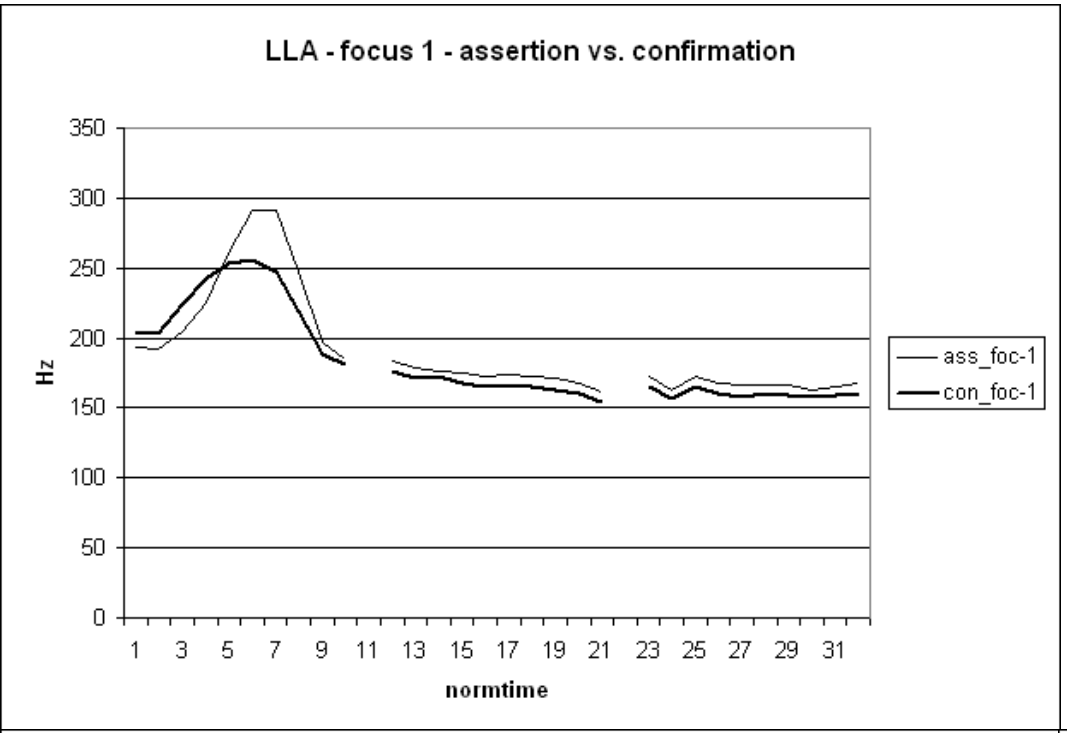




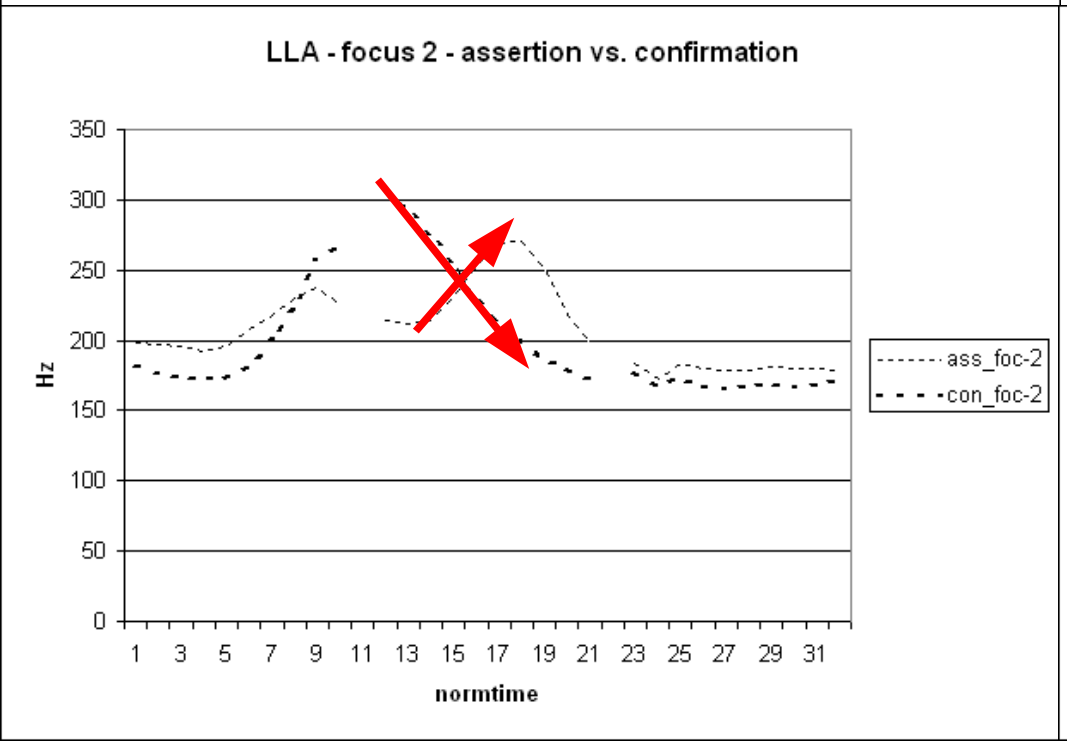
German female speaker

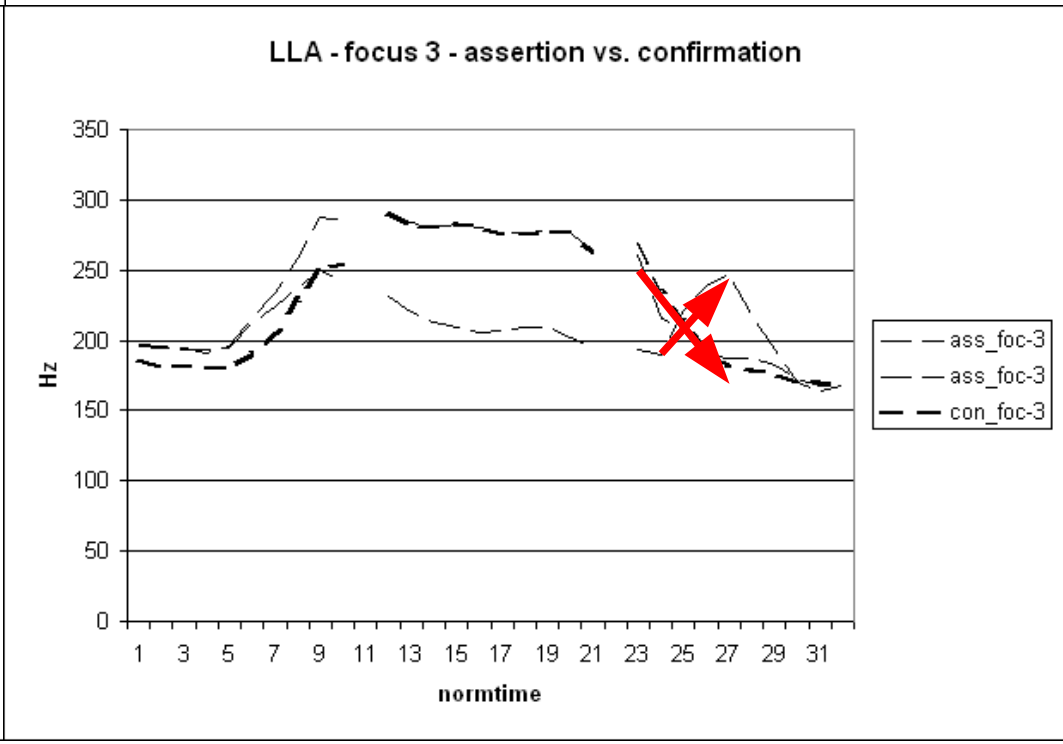
General plot characteristics

- time-normalized mean F0 contours (10 data points/ segment)
- each 'segment' = 1 word
  - Wallander
  - verlängert/ förlänger
  - November
- N = max. 5
  - Deviating patterns
  - Different strategies
  - Unsuccessful focus marking

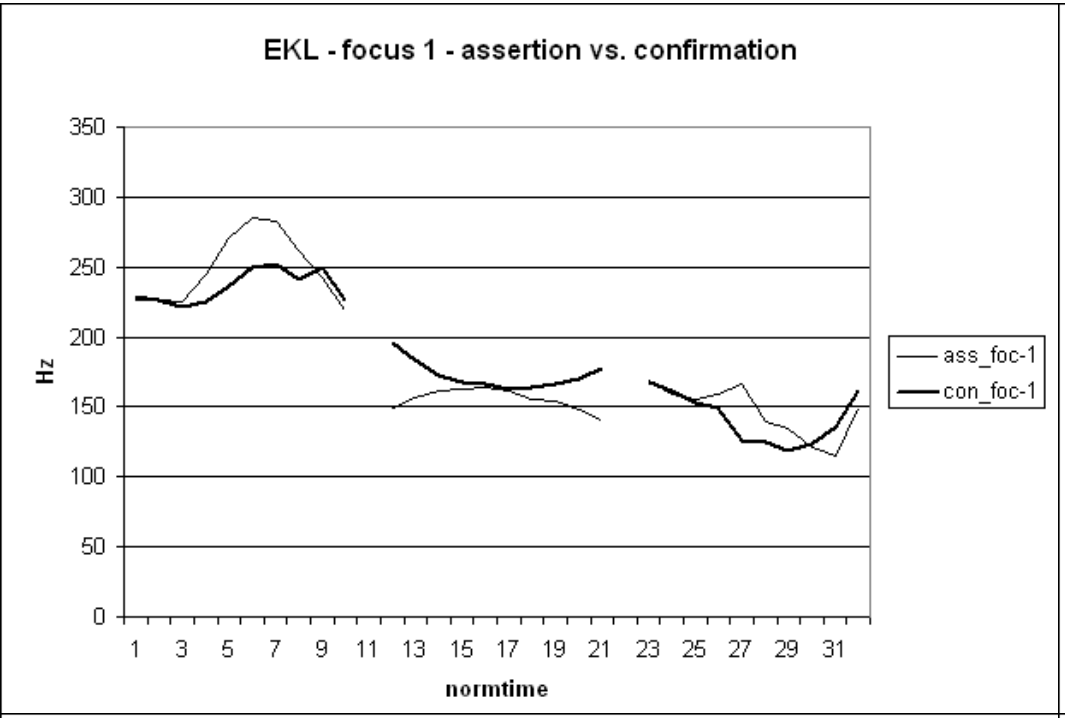


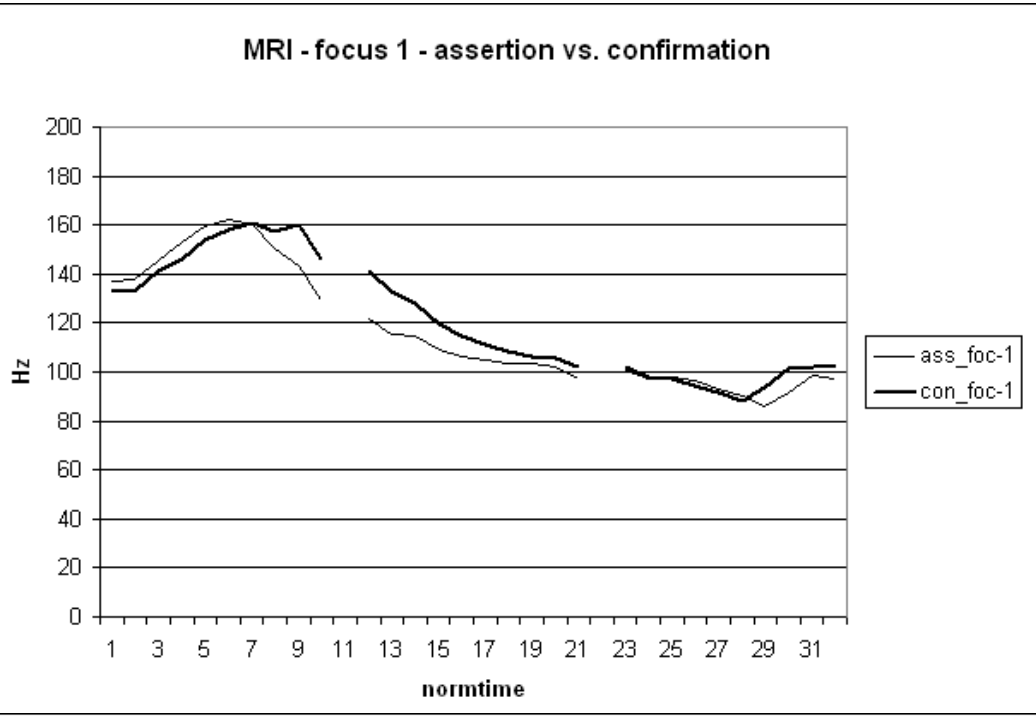
German female speaker

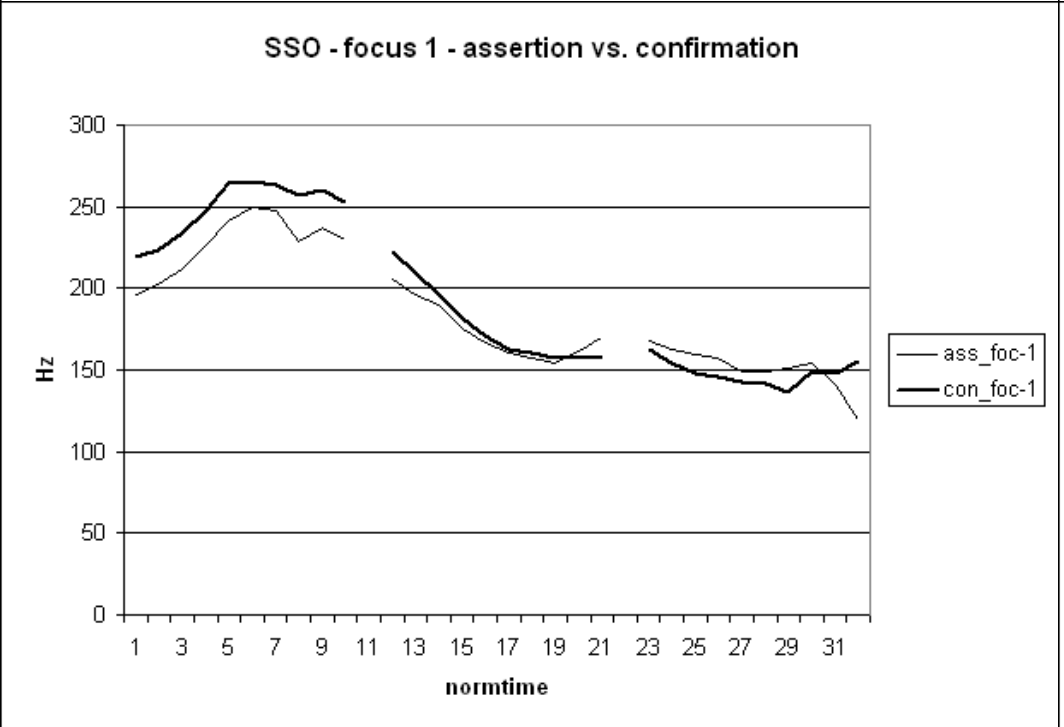


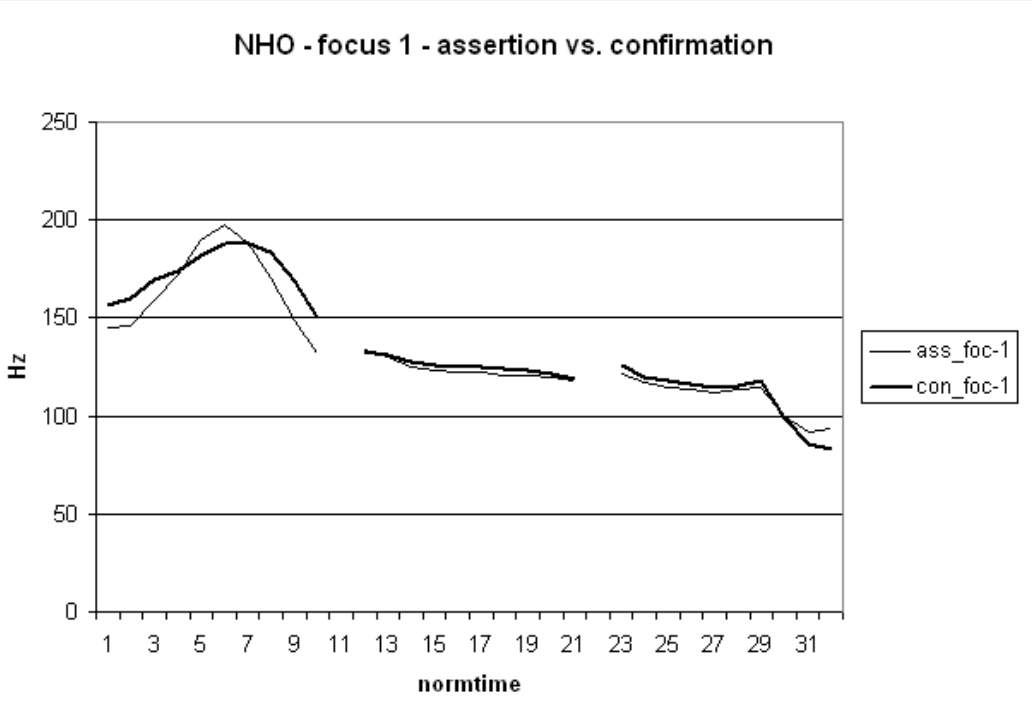


Swedish speakers – focus 1

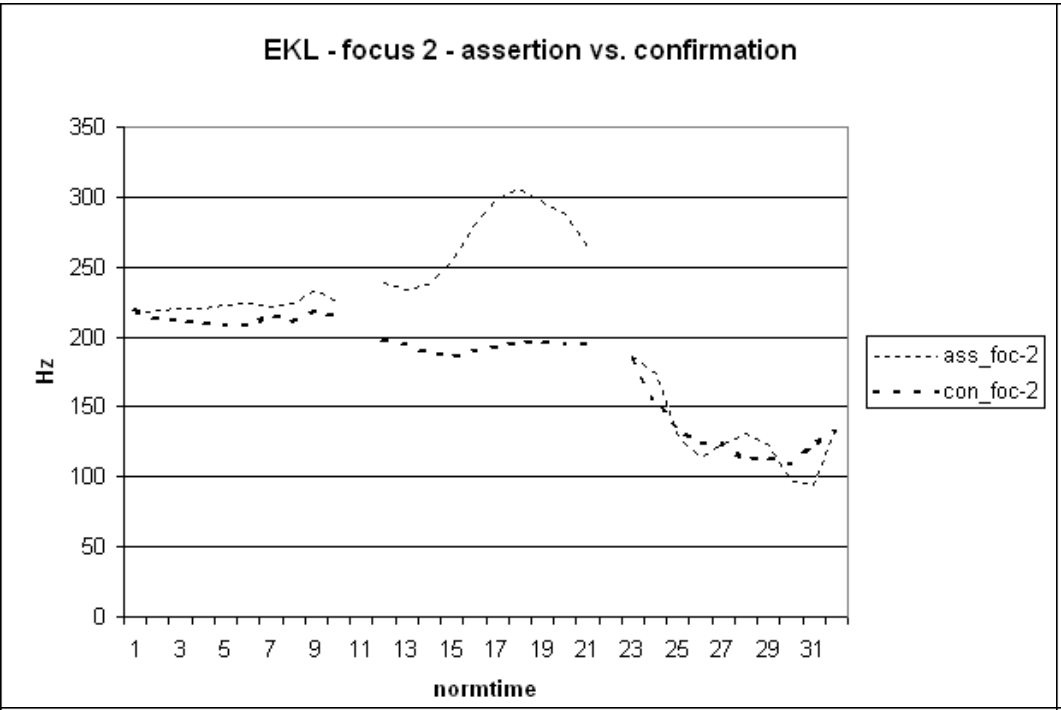


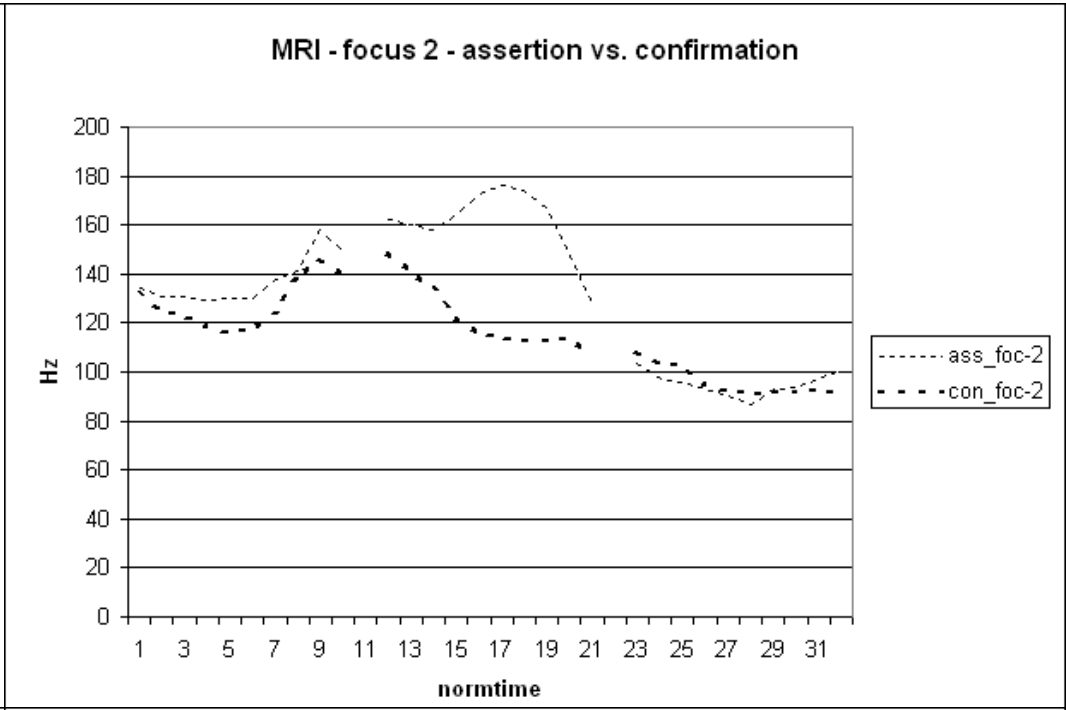


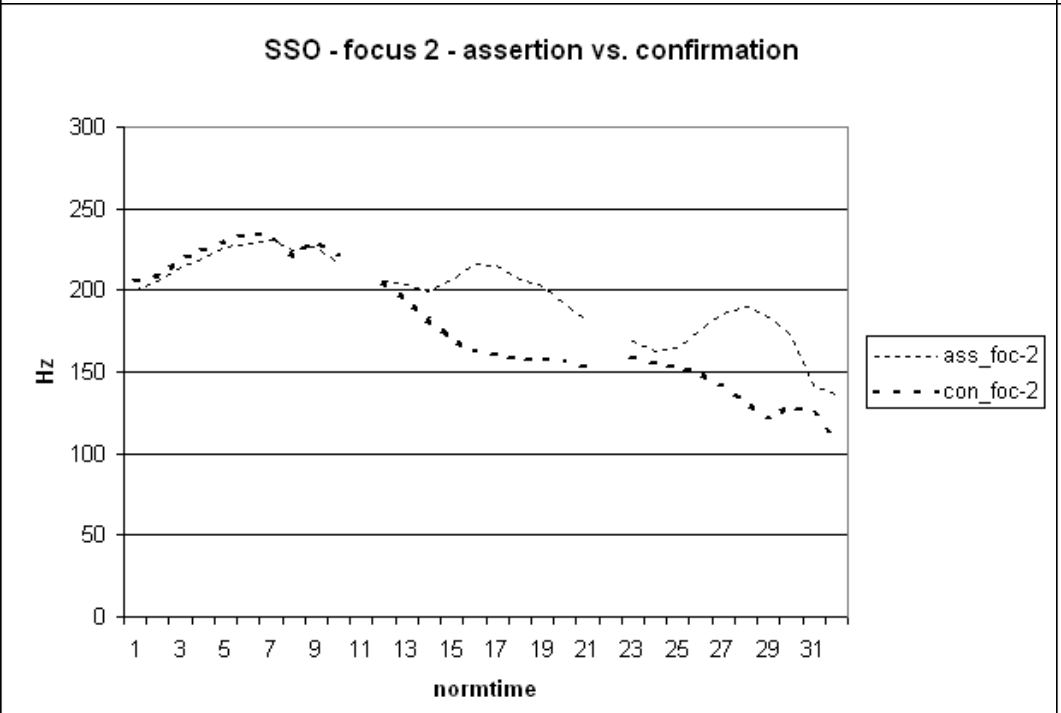


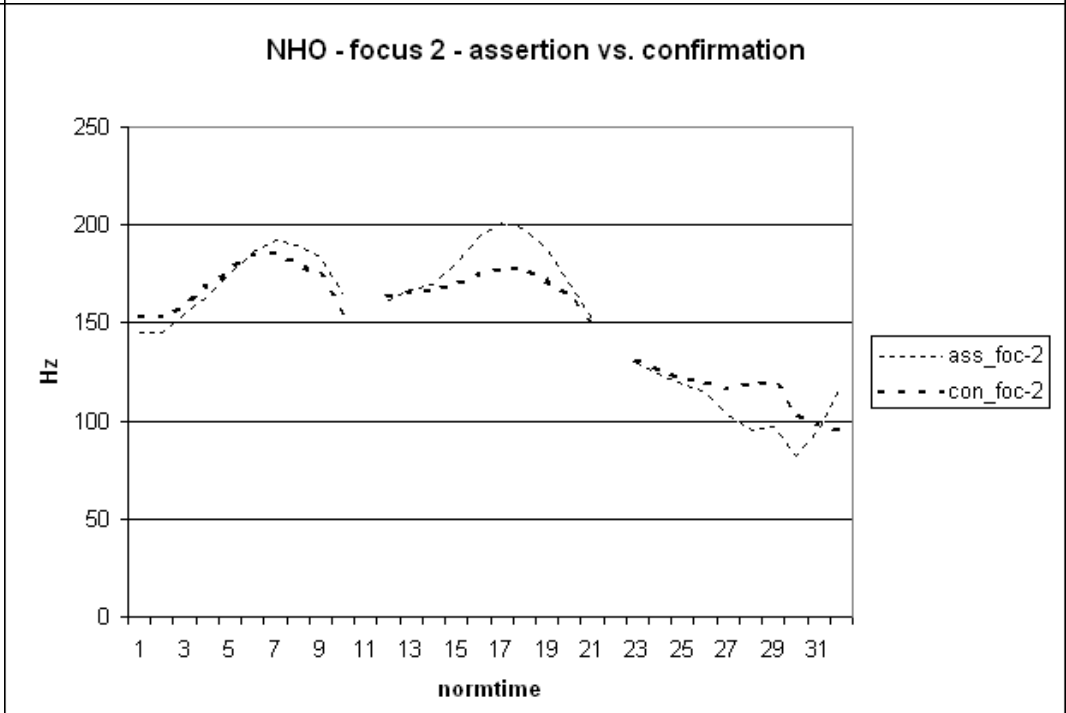


Swedish speakers – focus 2

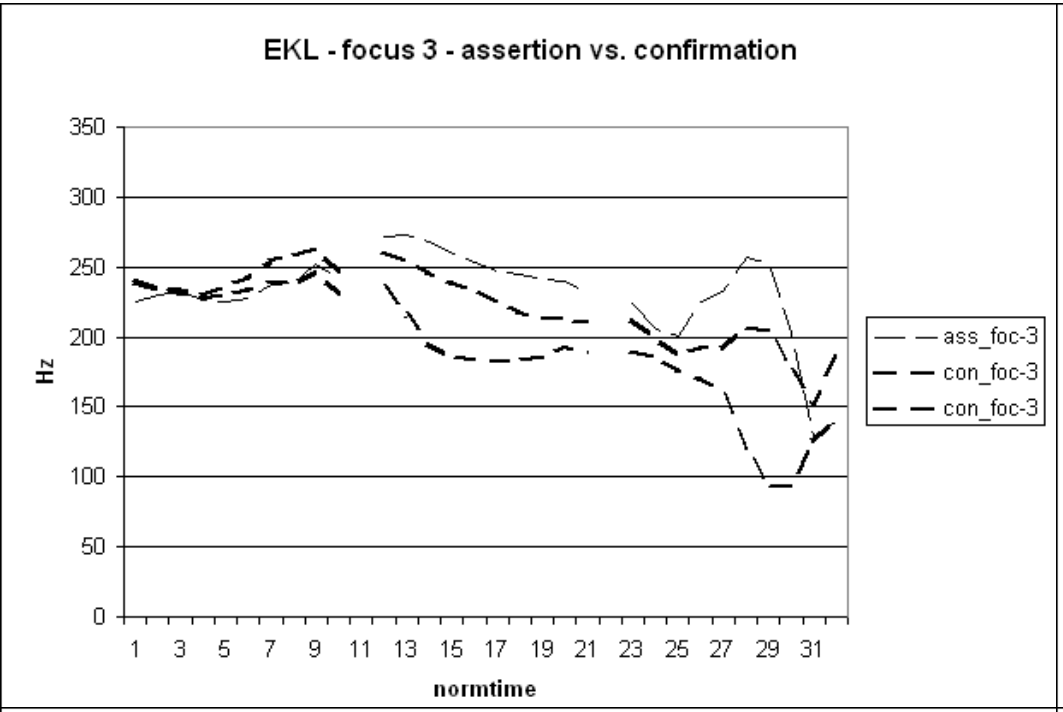


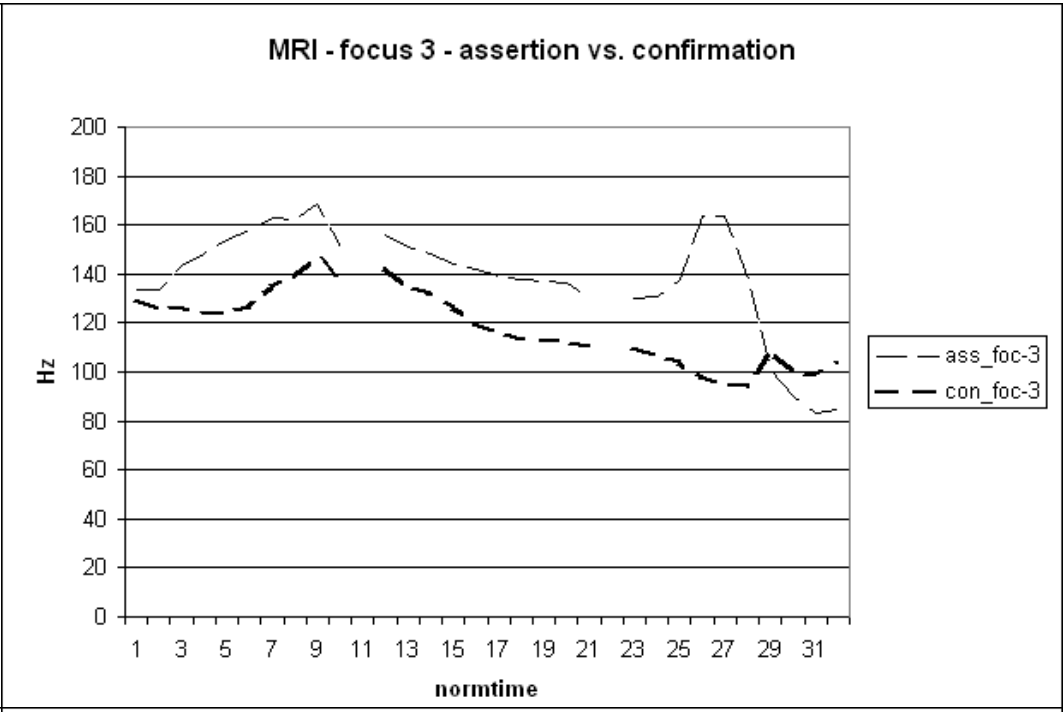


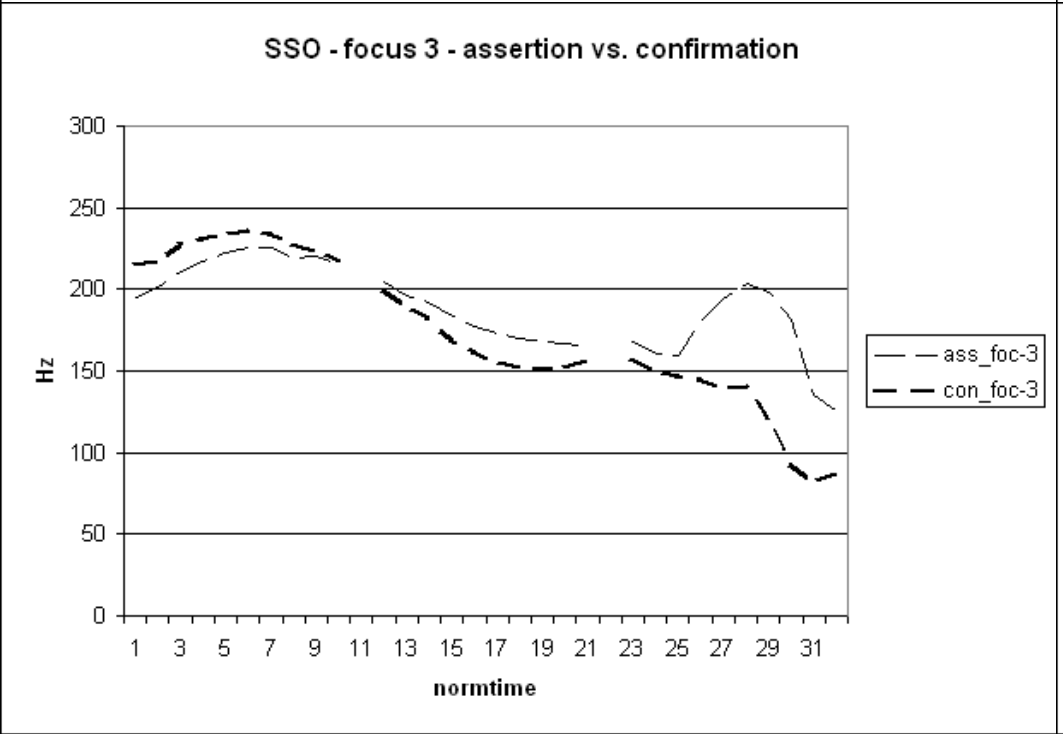


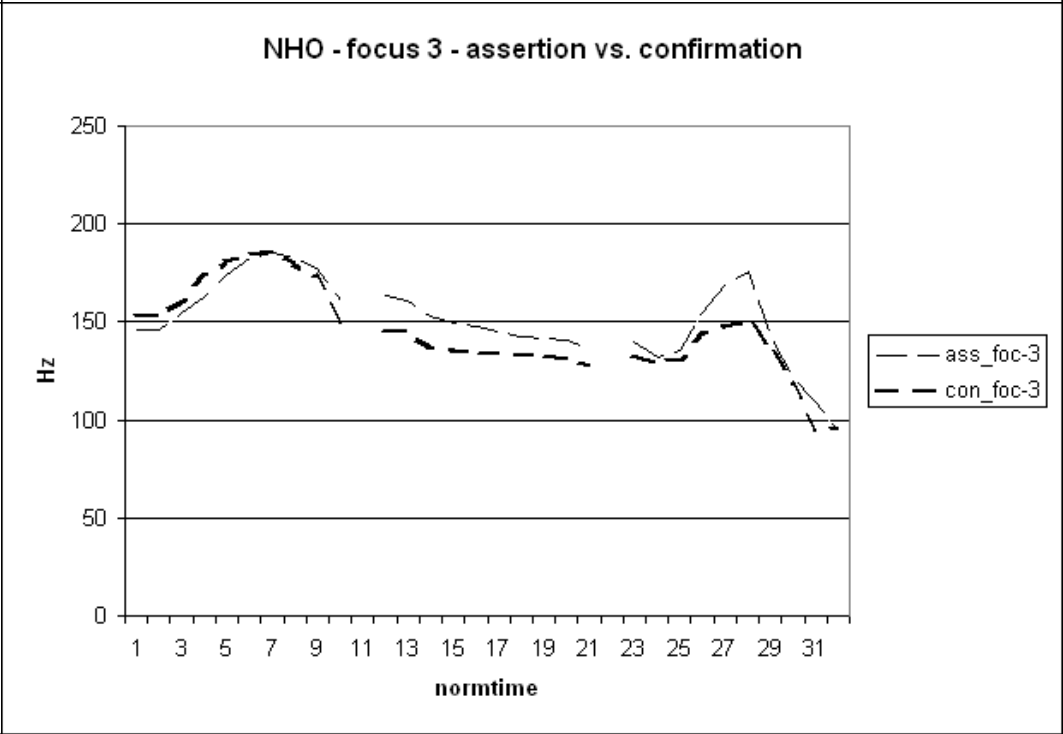


Swedish speakers – focus 3

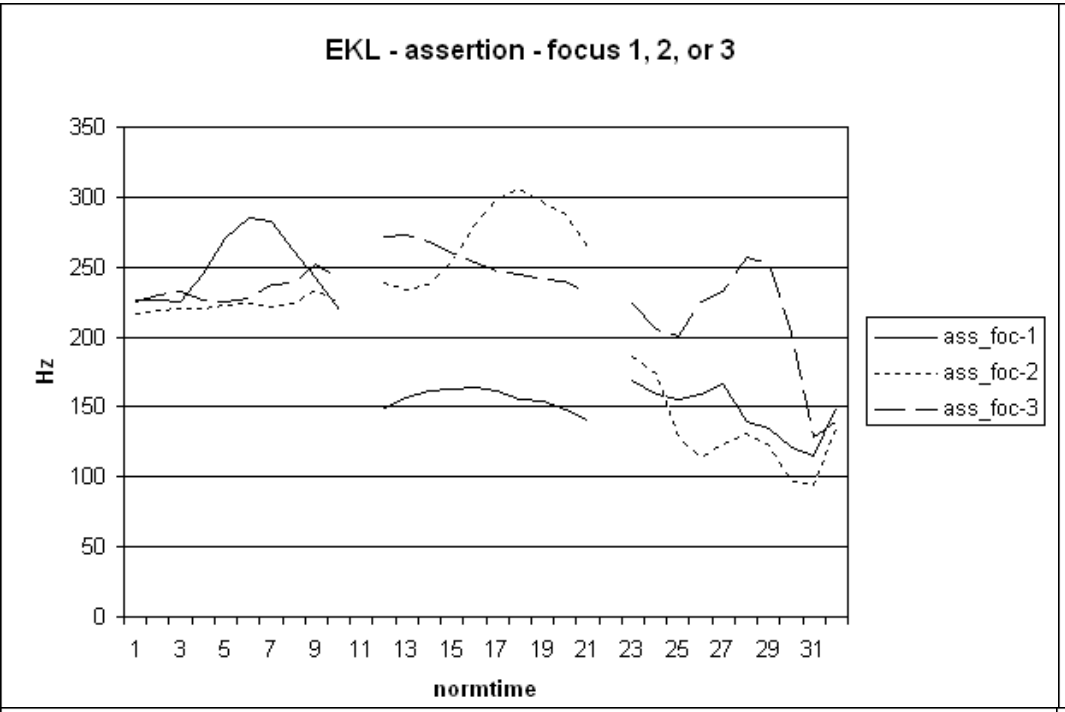


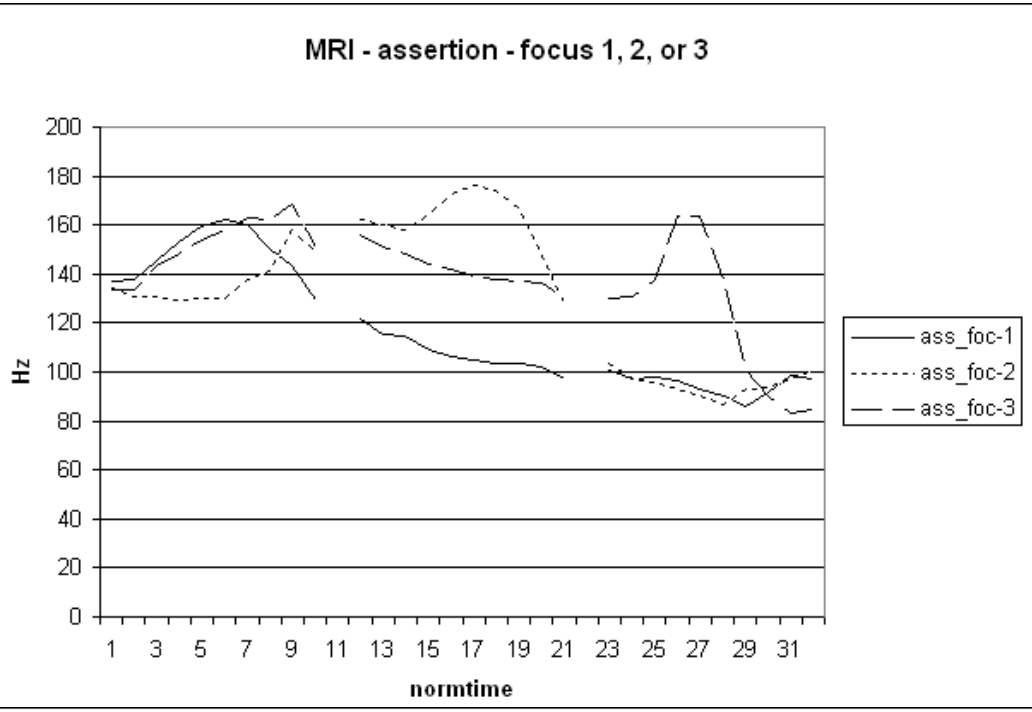


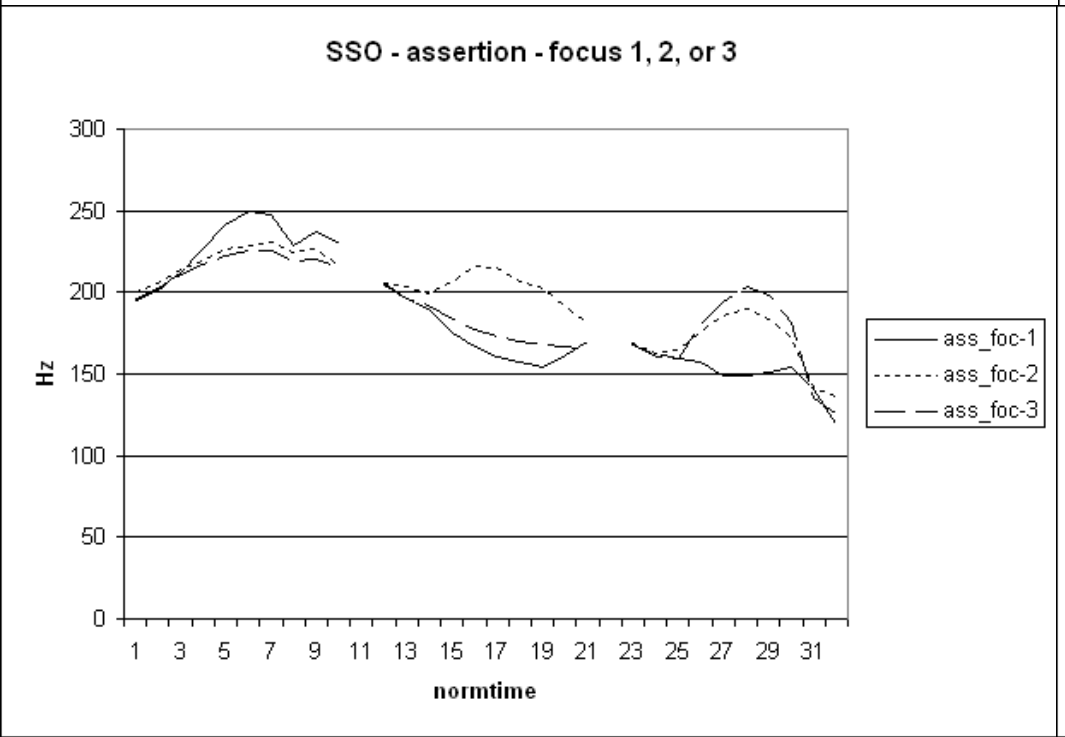


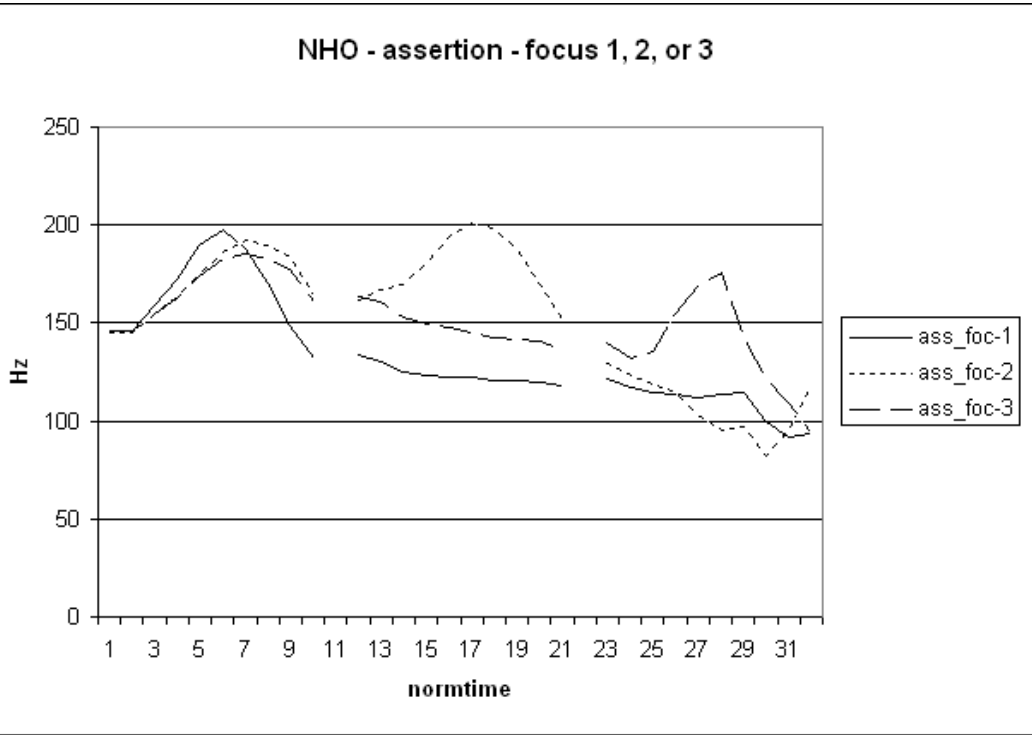


Swedish speakers – focus in assertions

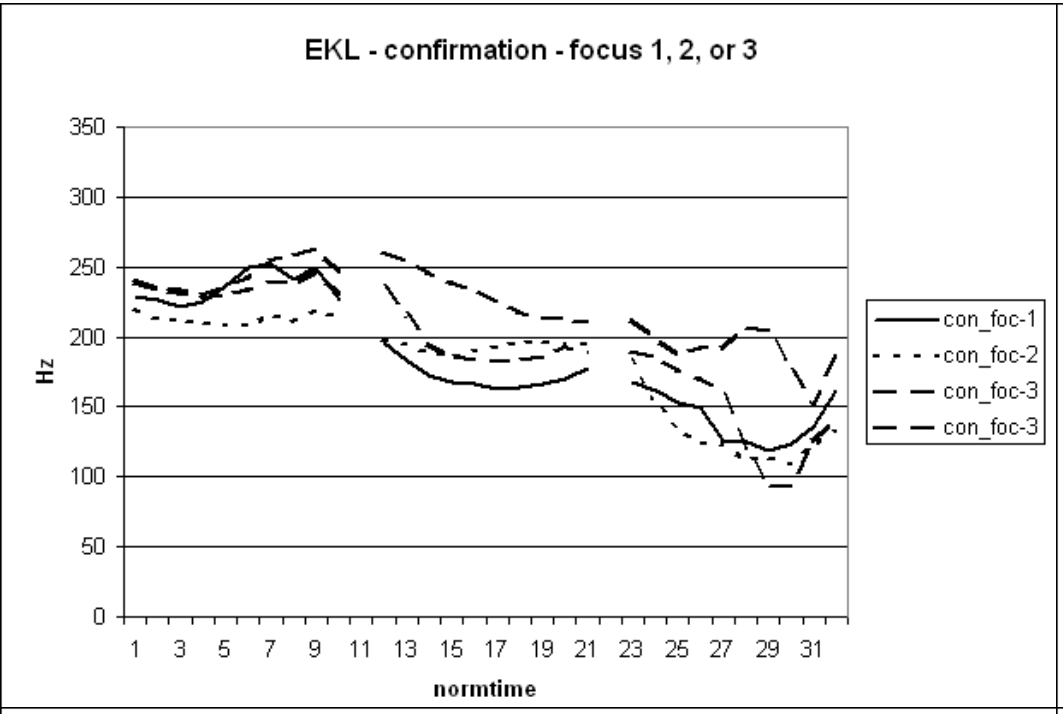


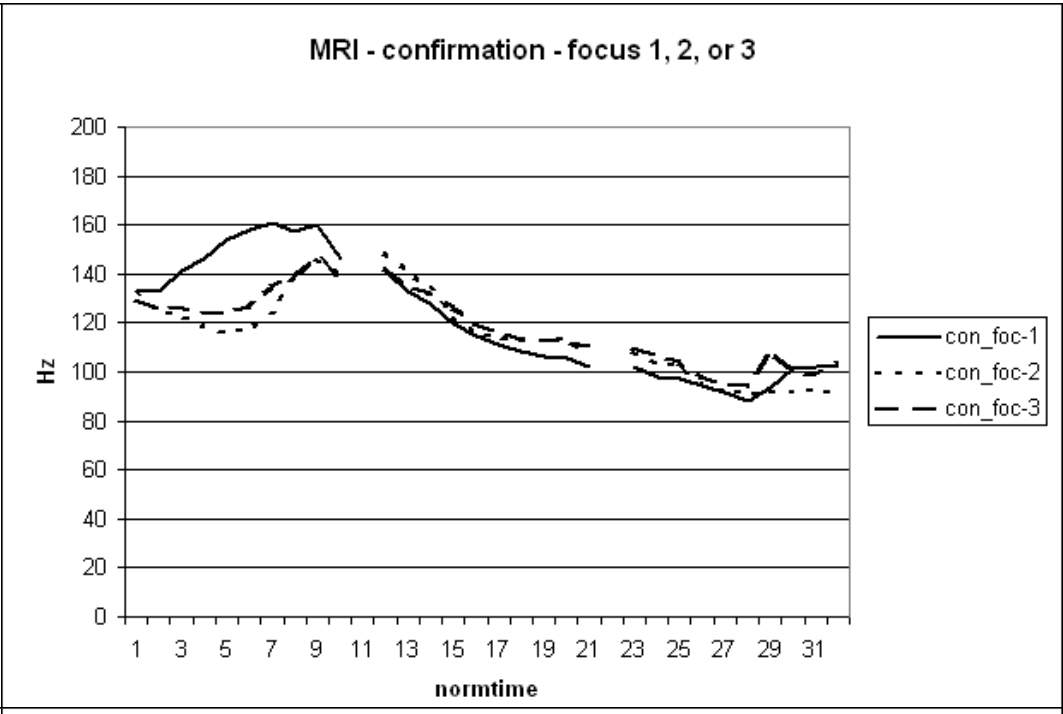


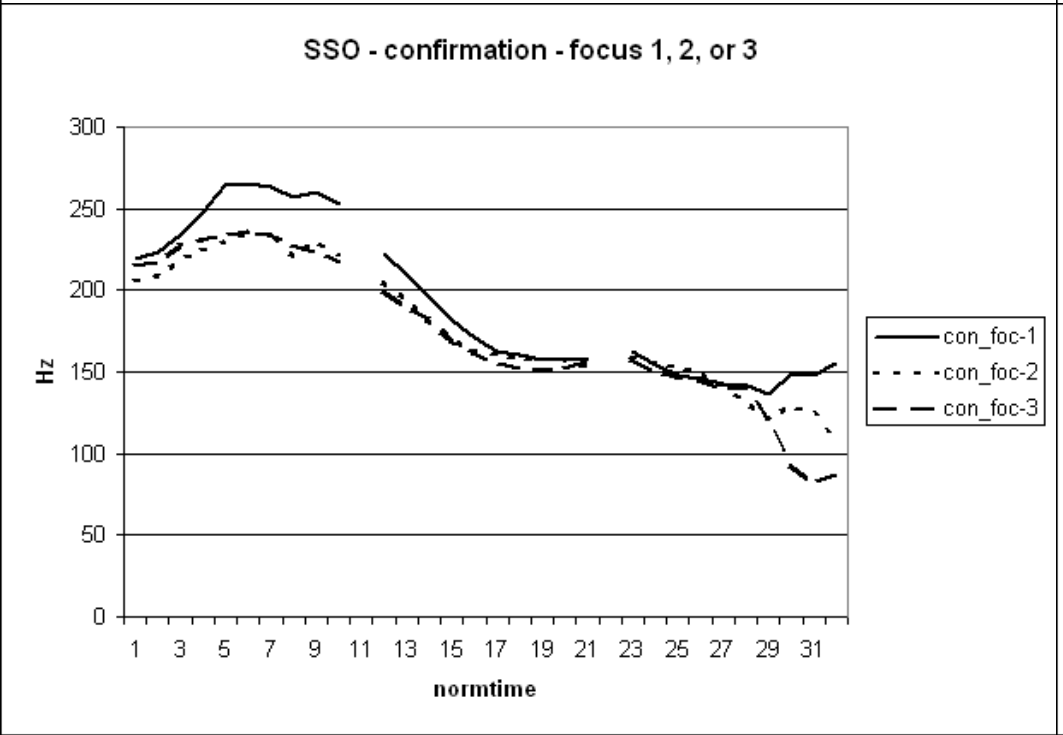


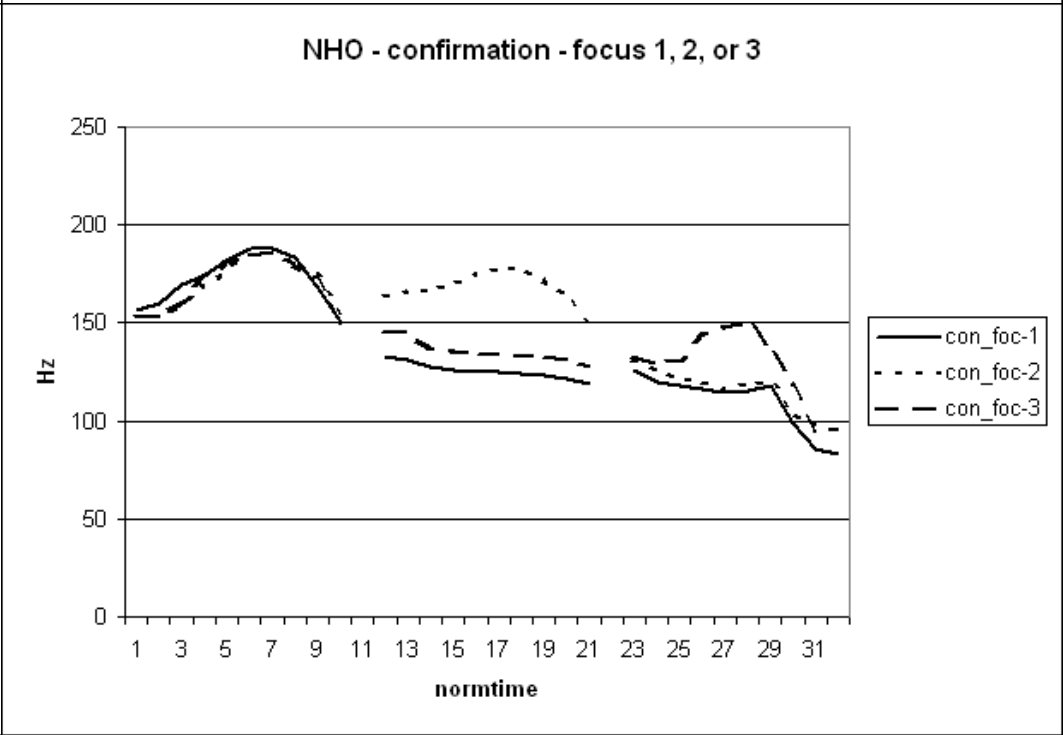


Swedish - focus in confirmations









Study 2 (confirmation & focus): summary and discussion

- Can ‘speech act’ (assertion/confirmation) and ‘focus position’ (1/2/3) be encoded in parallel?
  - Did the speakers clearly mark the focus position within each speech act condition?
    - German: assertion: **YES** / confirmation: **YES**
    - Swedish: assertion: **YES** / confirmation: **not really (3/4)**
  - Did the speakers clearly distinguish between assertion and confirmation in each focus position?
    - German: focus 1: **not really** / focus 2: **YES** / focus 3: **in part**
    - Swedish: focus 1: **not really** / focus 2: **YES** / focus 3: **YES (3/4)**

- Are the ‘not reallies’ actually ‘yesses’ or ‘nos’?
  - More parameters, e.g., duration
  - Perception experiments!

Study 2 (confirmation & focus): summary and discussion

- It is possible to elicit Swedish utterances lacking the rising focal accent H-.
  - One strategy of signalling confirmation
  - Not captured by the Lund model (yet)
- Focus may probably still be signalled in such utterances (perception experiments!)
- **Rising/ falling** accents may be a strategy of signalling focus in an **assertion/ confirmation** in both German a Swedish!
- Speech act and focus position can – at least in part – be encoded in parallel in German and Swedish

General conclusions

General (preliminary) conclusions

- ***global differences*** between German and Swedish
  - Hat pattern in German
- ***local difference(s) between German and Swedish:***
  - Accent I → falls on unfocussed words in Swedish

- ***global similarities*** between German and Swedish
  - Final rises or fall-rises in the expression of a 'request call' (study 1)
  - Rising/falling accent → focus in assertion/confirmation (study 2)