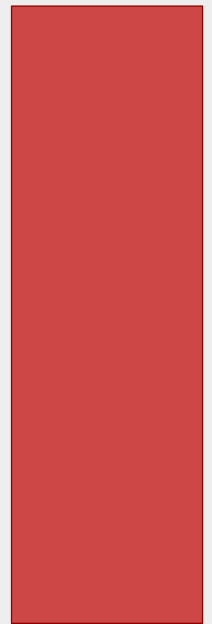


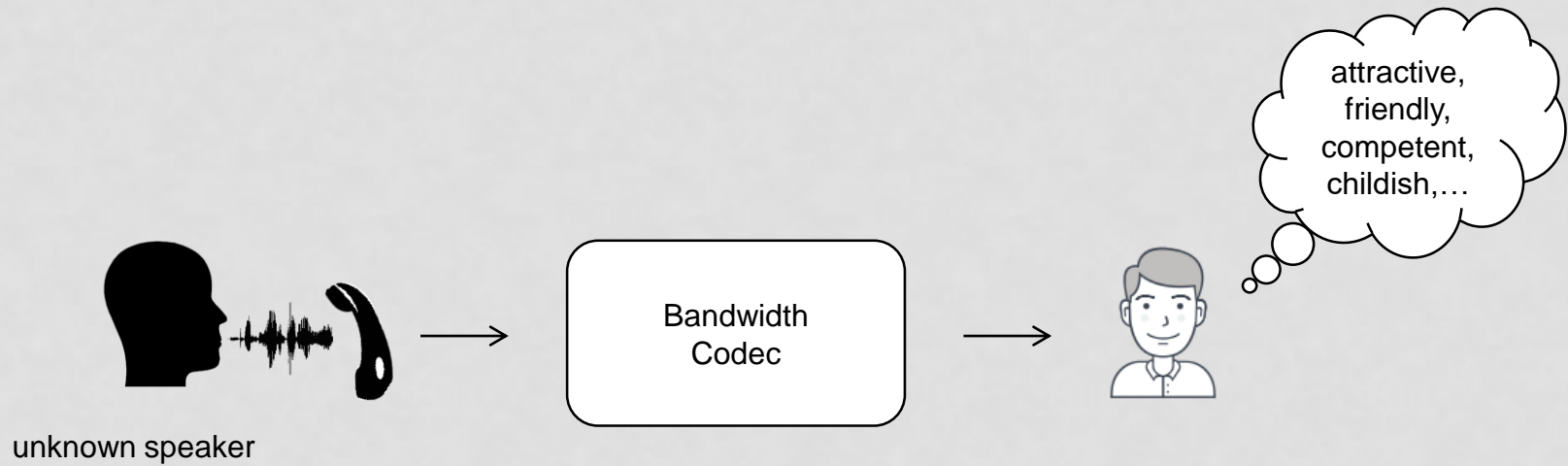
Effects of Transmitted Speech Bandwidth on Subjective Assessments of Speaker Characteristics

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Motivation



Outline

- Subjective test 
 - Speech stimuli selection
 - Channel degradations
 - Listening test
- Analysis
 - Speech quality and speaker attributions
 - Effects of bandwidth
- Conclusions

Speech stimuli selection

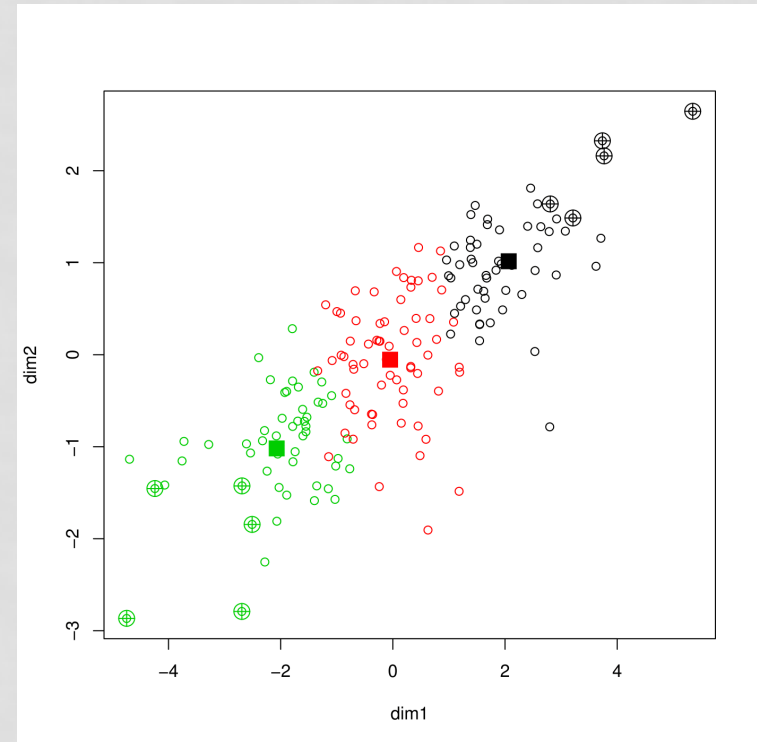
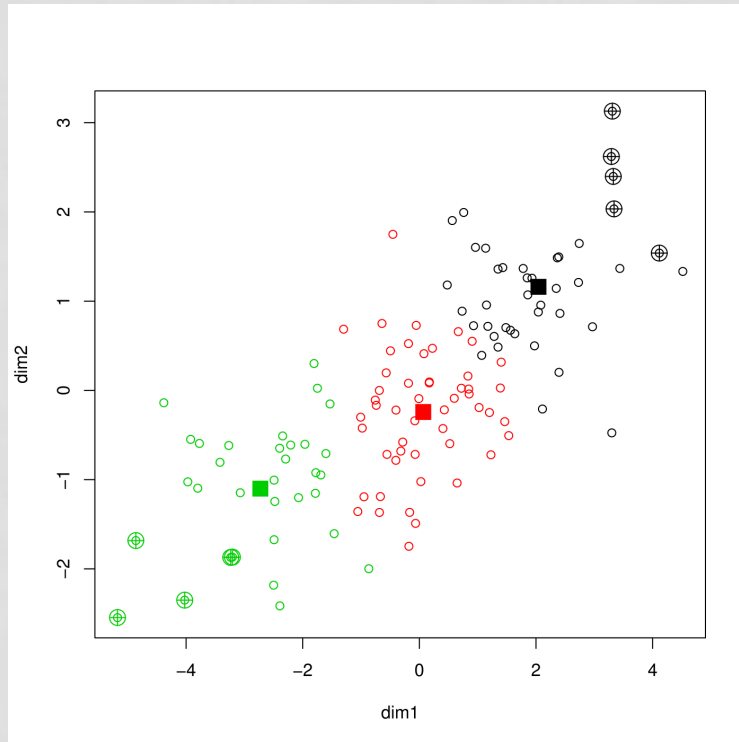
Corpus	Nautilus Speaker Characterization (NSC)
Number of speakers	300 speakers; 126 males, 174 females
Labels	34 interpersonal speaker attributions 34 voice descriptions for selected speakers
ISLRN	157-037-166-491-1
Author / Data owner	Laura Fernández Gallardo



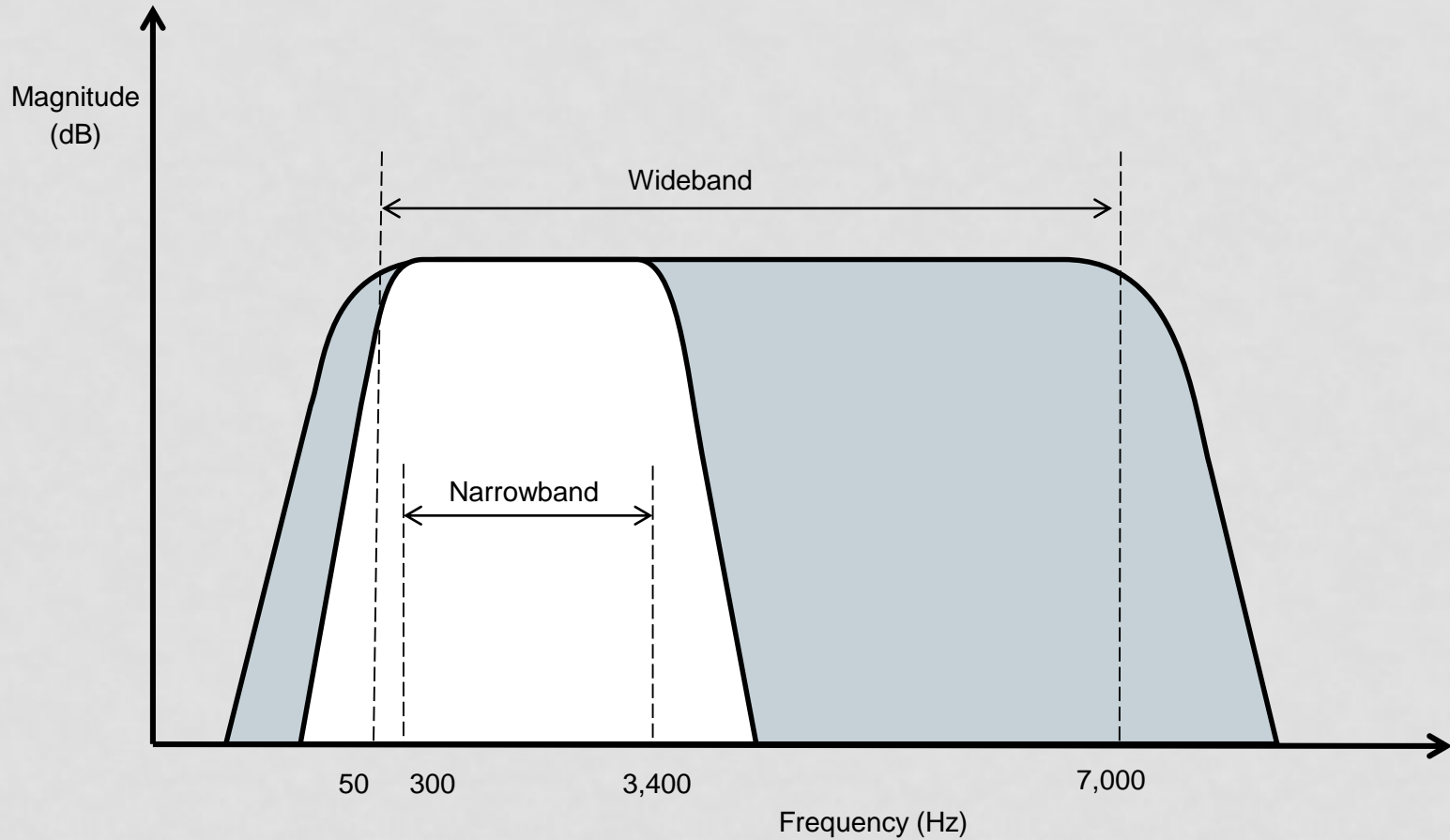
Speech from 10 males and 10 females with extreme **warmth – attractiveness (WAAT)**

Speech stimuli selection

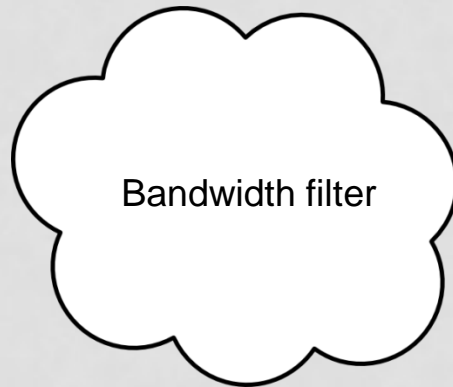
20 “extreme” speakers of the warmth-attractiveness space



Channel degradations

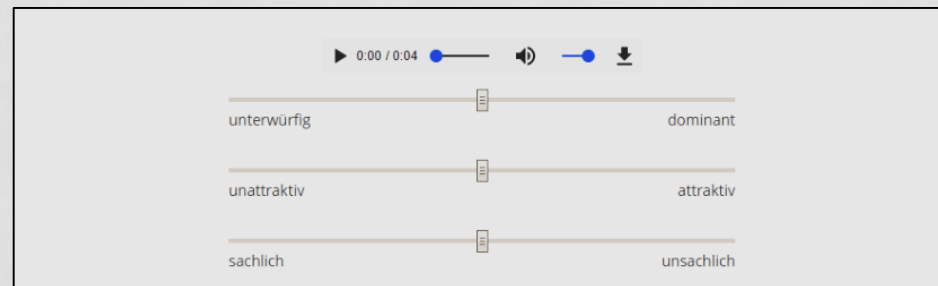


MOS - Speaker characteristics



„Inwieweit treffen die folgenden Attribute auf den Sprecher zu?“


Listeners:
10 males
13 females



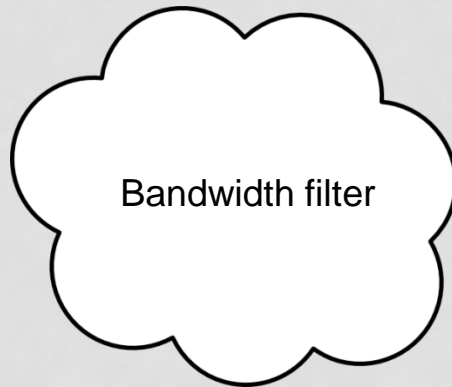
Speech labeling

item	Antonyms (German)		English translation	
1	sympathisch	unsympathisch	likable	non-likable
2	unsicher	sicher	insecure	secure
3	unattraktiv	attraktiv	unattractive	attractive
4	verständnisvoll	verständnislos	sympathetic	unsympathetic
5	entschieden	unentschieden	decided	indecisive
6	aufdringlich	unaufdringlich	obtrusive	unobtrusive
7	nah	distanziert	close	distant
8	interessiert	gelangweilt	interested	bored
9	emotionslos	emotional	unemotional	emotional
10	genervt	nicht genervt	irritated	not irritated
11	passiv	aktiv	passive	active
12	unangenehm	angenehm	unpleasant	pleasant
13	charaktervoll	charakterlos	characterful	characterless
14	reserviert	gesellig	reserved	sociable
15	nervös	entspannt	nervous	relaxed
16	distanziert	mitfühlend	distant	affectionate
17	unterwürfig	dominant	conformable	dominant
18	affektiert	unaffektiert	affected	unaffected
19	gefühlskalt	herzlich	cold	hearty
20	jung	alt	young	old
21	sachlich	unsachlich	factual	not factual
22	aufgeregt	ruhig	excited	calm
23	kompetent	inkompetent	competent	incompetent
24	schön	hässlich	beautiful	ugly
25	unfreundlich	freundlich	unfriendly	friendly
26	weiblich	männlich	feminine	masculine
27	provokativ	gehorsam	offensive	submissive
28	engagiert	gleichgültig	committed	indifferent
29	langweilig	interessant	boring	interesting
30	folgsam	zynisch	compliant	cynical
31	unaufgesetzt	aufgesetzt	genuine	artificial
32	dumm	intelligent	stupid	intelligent
33	erwachsen	kindlich	adult	childish
34	frech	bescheiden	bold	modest

Outline

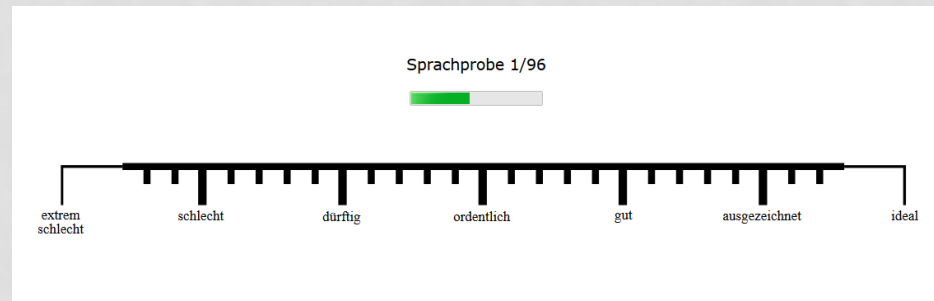
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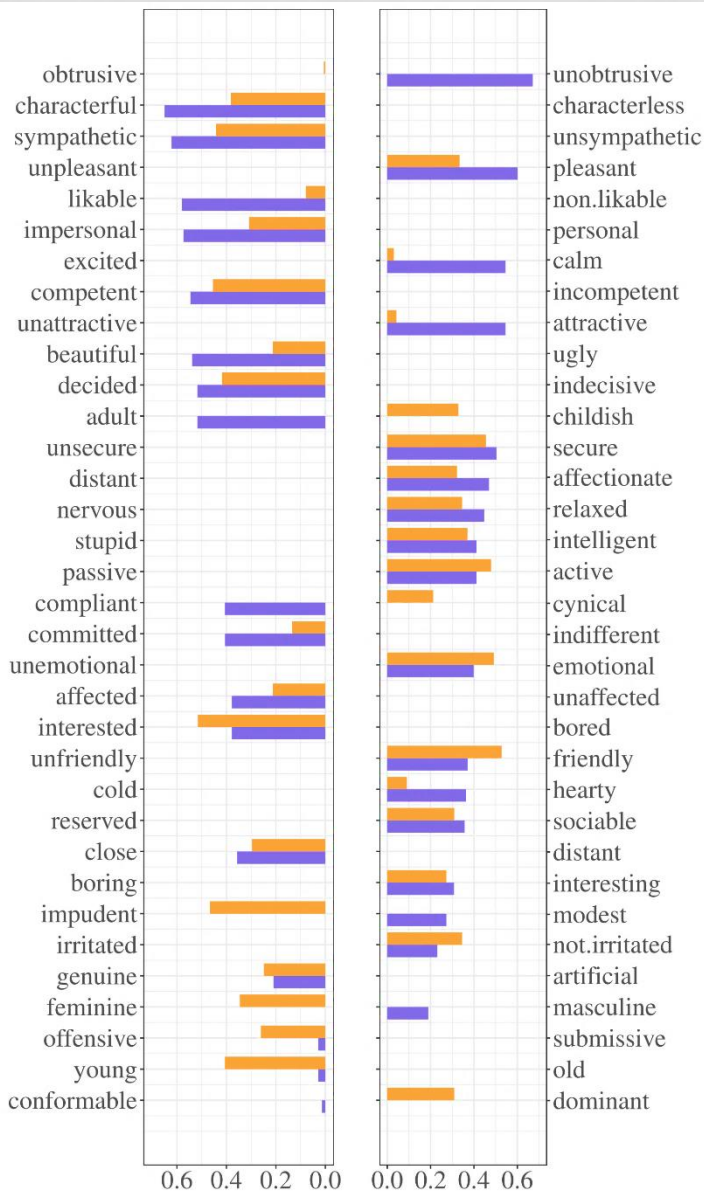
MOS - Speaker characteristics



„Bitte beurteilen Sie die nachfolgenden Sprachproben nach ihrer Gesamtqualität“

Listeners:
10 males
10 females





■ male speakers ■ female speakers

With higher speech quality (MOS), speakers characteristics highlighted:



- unobtrusive, characterful, sympathetic, likable
- pleasant, attractive, beautiful
- impersonal, competent, calm, adult, decided, secure



- friendly, sympathetic, characterful
- interested, emotional, active, young
- impudent, competent, secure, decided, intelligent

Bandwidth effects

- 2-way repeated measures ANOVA


item	bw	WAAT	bw:WAAT
adult - childish	✓	✓	
decided - indecisive		✓	✓
impudent - modest	✓		
obtrusive - unobtrusive	✓		
sympathetic - unsympathetic	✓	✓	



item	bw	WAAT	bw:WAAT
competent - incompetent		✓	✓
offensive - submissive			✓
beautiful - ugly		✓	✓



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Conclusions

- Influence of NB and WB on the perceptions of speakers
 - a) Correlations MOS – speaker characteristics
 - b) ANOVA
- Manifested with higher quality (WB):
 - Males: unobtrusiveness/discretion/maturity, sympathy, and confidence
 - Females: competence
- Maybe due to the alteration of pitch frequency in NB transmissions
- Outcomes can assist the design of transmission channel settings and motivate the deployment of WB communications

Thank you for your attention!

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<http://www.qu.tu-berlin.de/?id=lfernandez>