



# Listener judgements for social traits and criminal behaviours as a function of speaker pitch and articulation rate.

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# The IVIP project



- **Improving Voice Identification Procedures**
- Interdisciplinary ESRC funded project in linguistics, criminology, psychology and law
- Aims to **improve the understanding of earwitness behaviour** and to **improve the interaction of the criminal justice system with the use of earwitness evidence.**
- Strand 3: how social stereotypes affect voice identification.

# Background

# Background: Pitch



Lower pitch

more **threatening** (Tompkinson 2018)

in men, more **masculine to women** (Cartei et al. 2014)

Higher pitch

more **extraverted/open**

less **emotionally stable** and less **conscientious** (Imhof 2010)

women more **attractive to men** listeners (Collins and Missing 2003; Jones et al. 2008)

Raised pitch

more **persuasive** (Pittam 1990)

# Background: Articulation rate



Lower AR



older **age** (Gordon et al. 2019)



lower **confidence** (Jiang and Pell 2017)



higher **anxiety** (Feiler & Powell 2016)

Higher AR



more **competent and attractive** (Street et al. 1983)



**better communicators** (Gordon et al. 2019)



more **credible and confident** (Cesario & Higgins 2008)

# Previous study: UK accents



## Relationship between standardness, status & crime

Standard variety  
SSBE rates high on  
status, and low  
criminality

Non-standard rate  
lower on status and  
higher on criminality

## Insight into UK variation

Non-English accents rate  
high on **solidarity** traits

Also high on **morally good**  
behaviours, low on **morally bad**

Northern English & London  
most criminal, lowest status

## Insight into behaviour judgements

Association between  
'blue-collar' crime and  
Northern/London accents

Driving and sex offences  
less clear relationship with  
standardness

New insight on SSBE and  
**morally ambiguous**  
behaviour

# Aims & Methods

# Aims & Research Questions



Based on a speaker's **pitch** and **articulation rate**:

1. To investigate whether listeners vary on their judgements on **social traits**
2. To examine whether listeners perceive speakers as **more or less likely to behave in certain (criminal) ways**



To identify any interventions that could be made regarding implicit bias to protect against unreliable evidence and miscarriages of justice.

# Present study



## Overview

2 experiments: Pitch and AR

180 participants, BrE speakers

10 traits and 10 behaviours on  
Likert scale 1-7

## Questionnaire

Social traits questions: **status, solidarity, dynamism**

Behavioural questions: **morally good, bad, and ambiguous behaviours**

Also a **range of offence types**

## Materials

3 x samples of 3 x UK accents

15s spontaneous speech  
collage

Manipulated for pitch and AR

# Present study: Experimental design



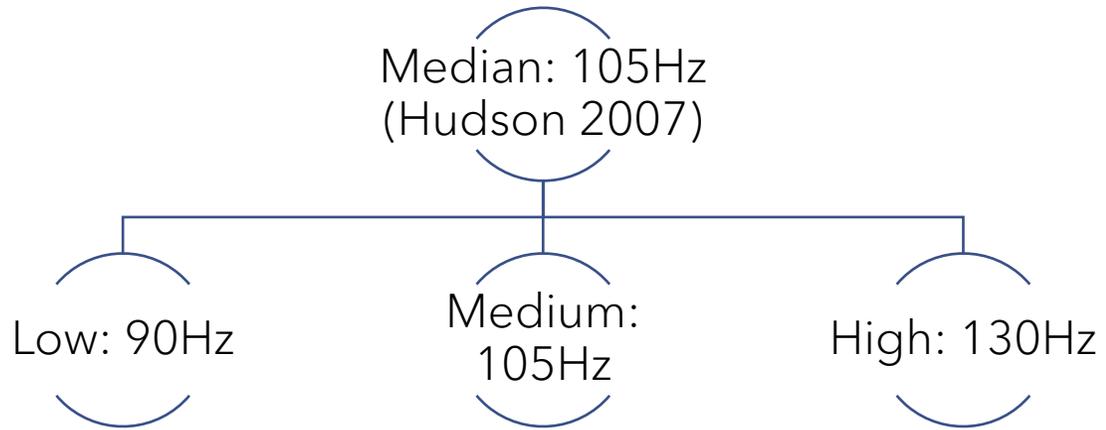
- **3 x samples** of **3 x UK accents** (+ 4 distractor voices) = 13 stimuli total
  - **Low, medium** or **high**
  - **Pitch** (exp. 1) or **AR** (exp. 2)
- Participants assigned randomly to **traits** or **behaviours** condition
- Split into **3 groups** to cover all samples:

Accent	Condition	Group 1			Group 2			Group 3		
<b>Belfast</b>	Sample	A	B	C	A	B	C	A	B	C
	Pitch/AR	High	Medium	Low	Low	High	Medium	Medium	Low	High
<b>Liverpool</b>	Sample	A	B	C	A	B	C	A	B	C
	Pitch/AR	High	Medium	Low	Low	High	Medium	Medium	Low	High
<b>SSBE</b>	Sample	A	B	C	A	B	C	A	B	C
	Pitch/AR	High	Medium	Low	Low	High	Medium	Medium	Low	High

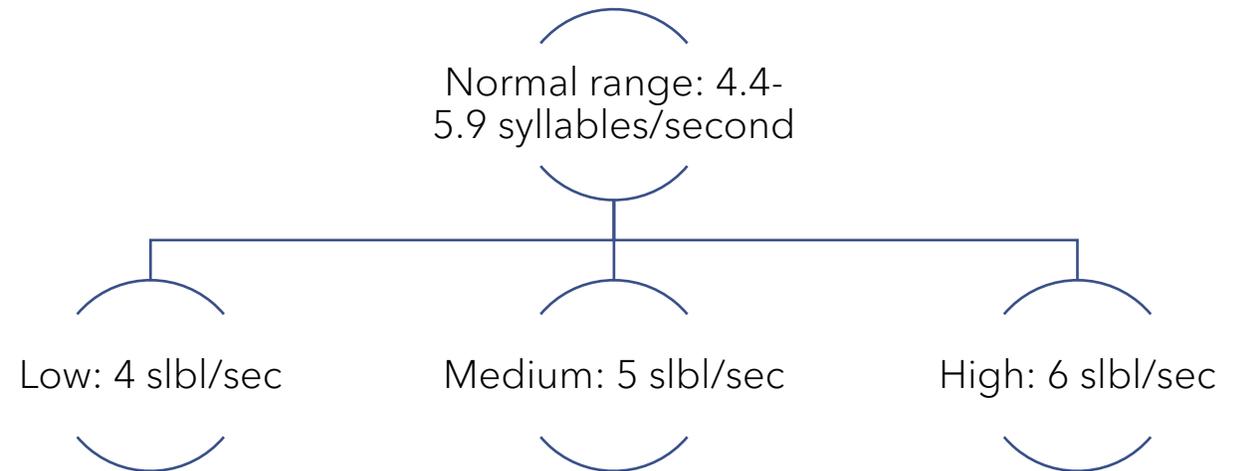
# Present study: stimuli



## Pitch (Experiment 1)



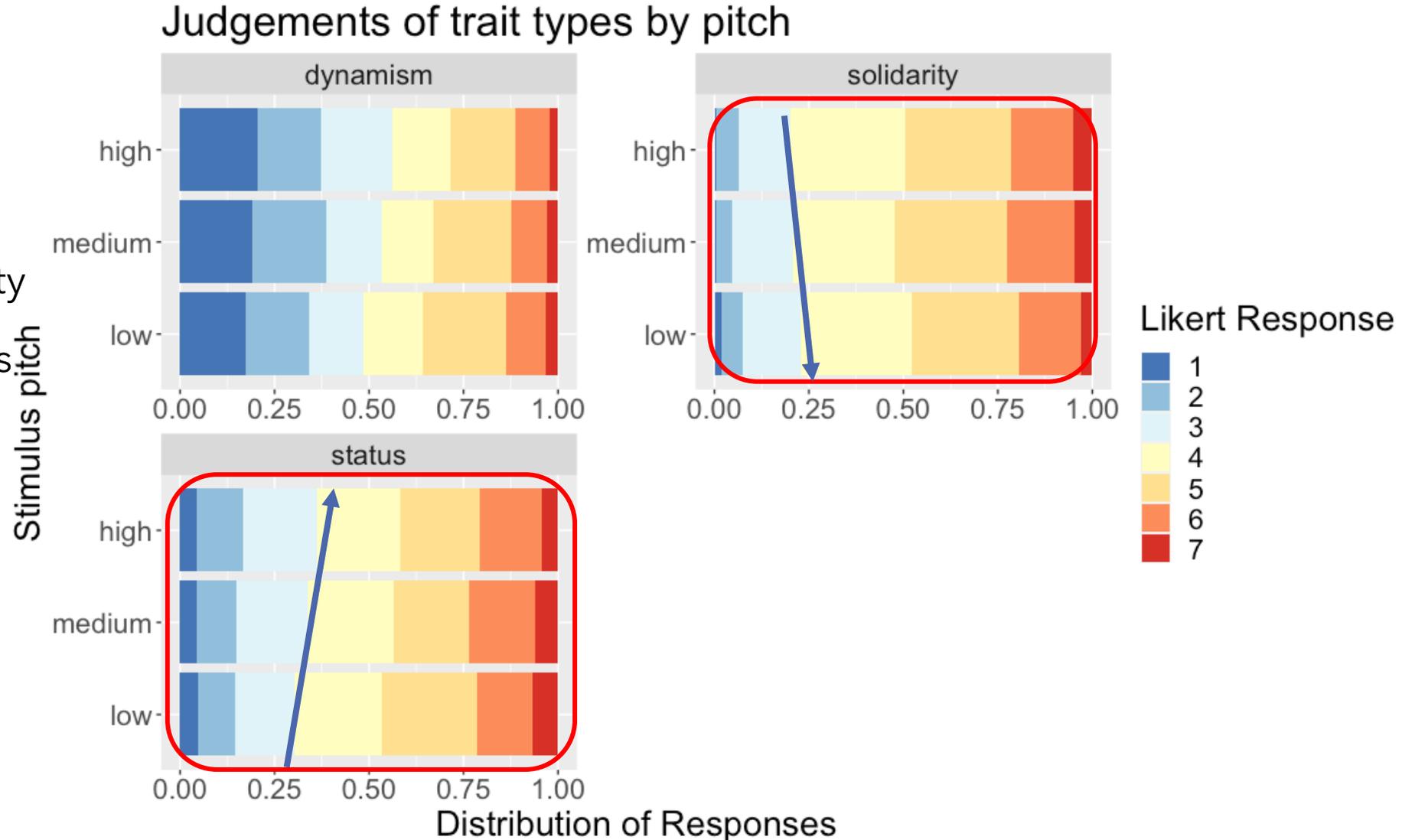
## AR (Experiment 2)



# Results

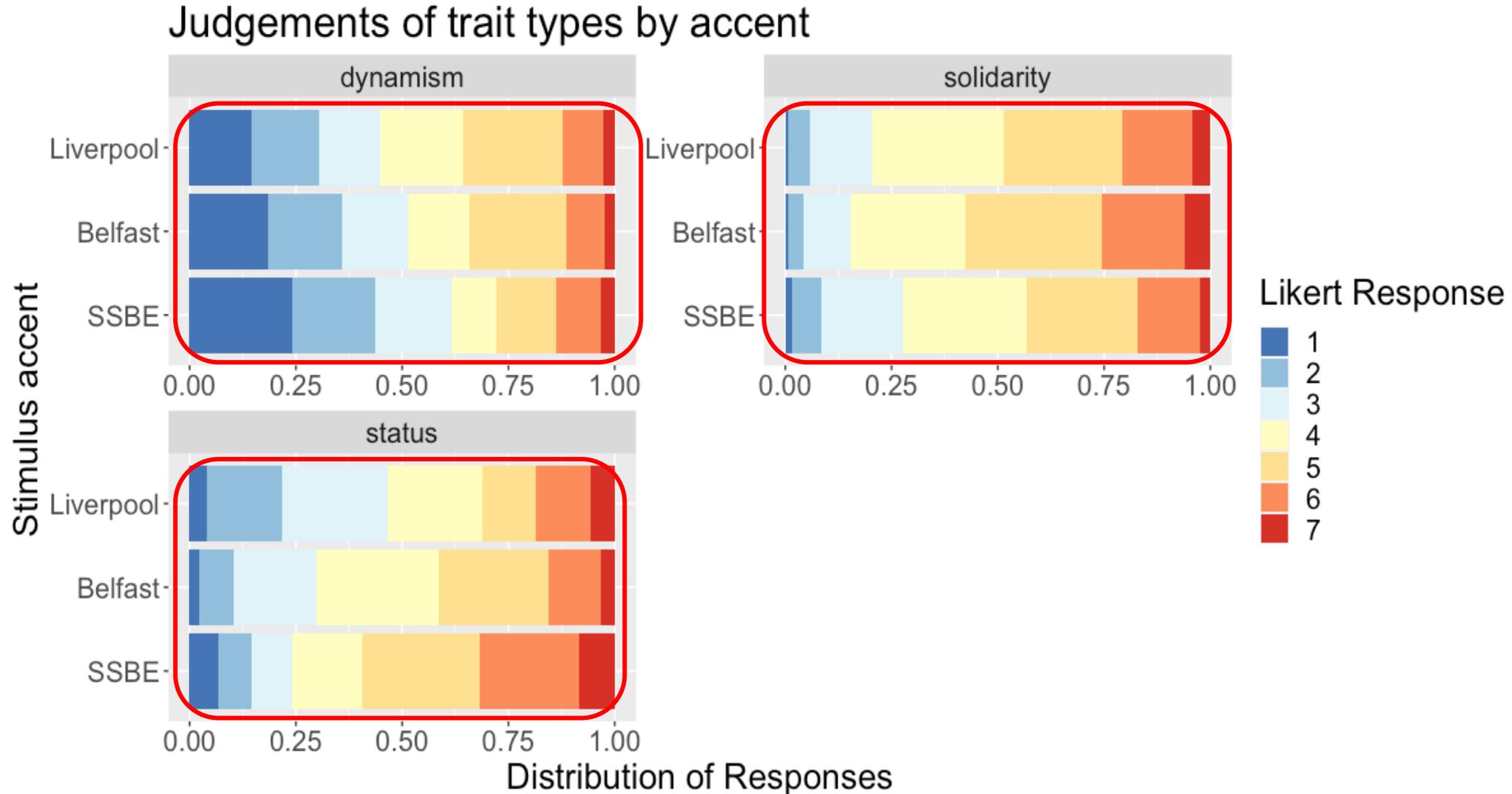
# Results: Experiment 1 (Pitch)

- High pitch → low status
- Low pitch → low solidarity
- Similar effect of accent as seen in previous experiment



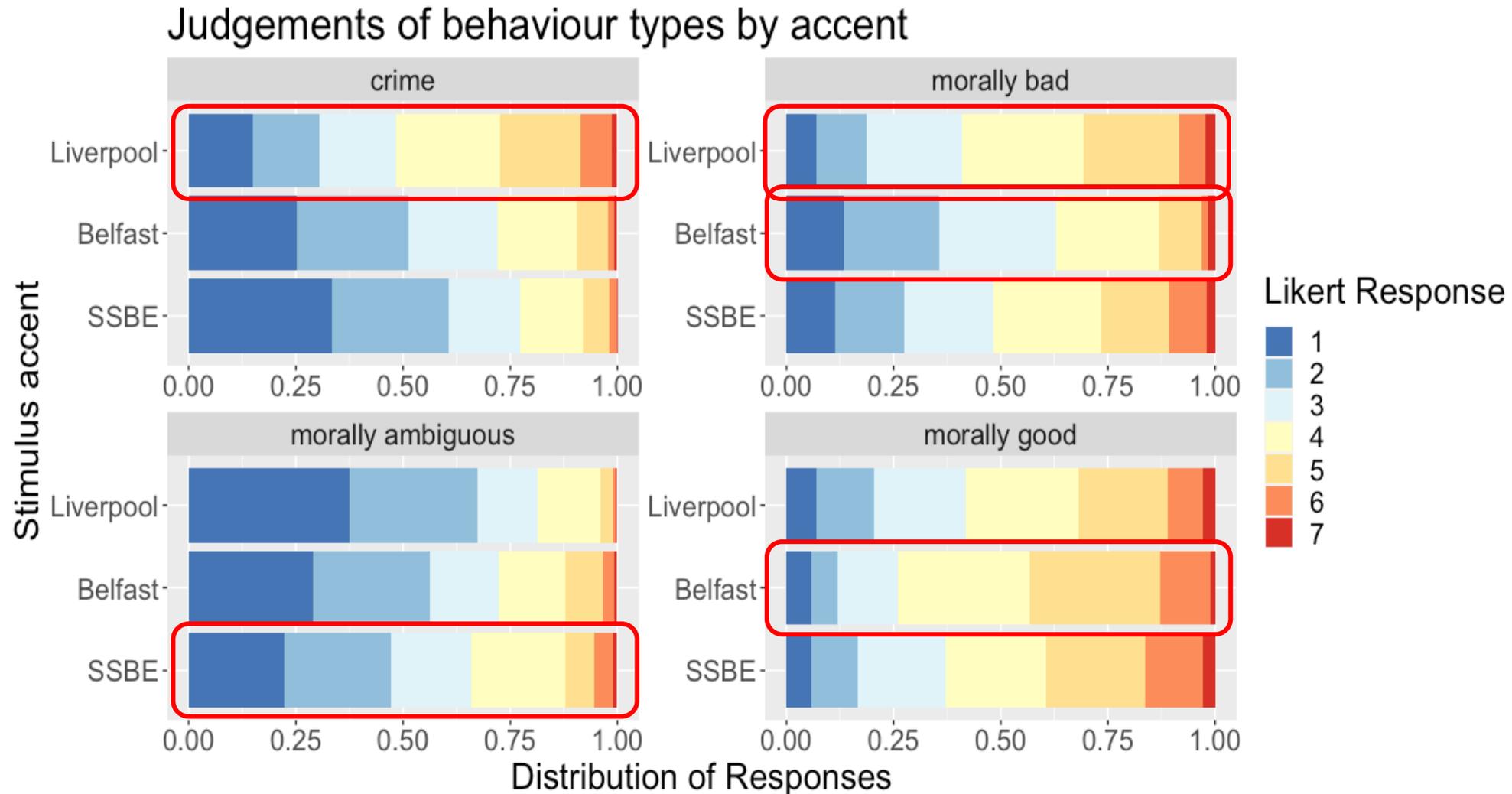
# Results: Experiment 1 (Pitch)

- Similar effect of accent as seen in previous experiment



# Results: Experiment 1 (Pitch)

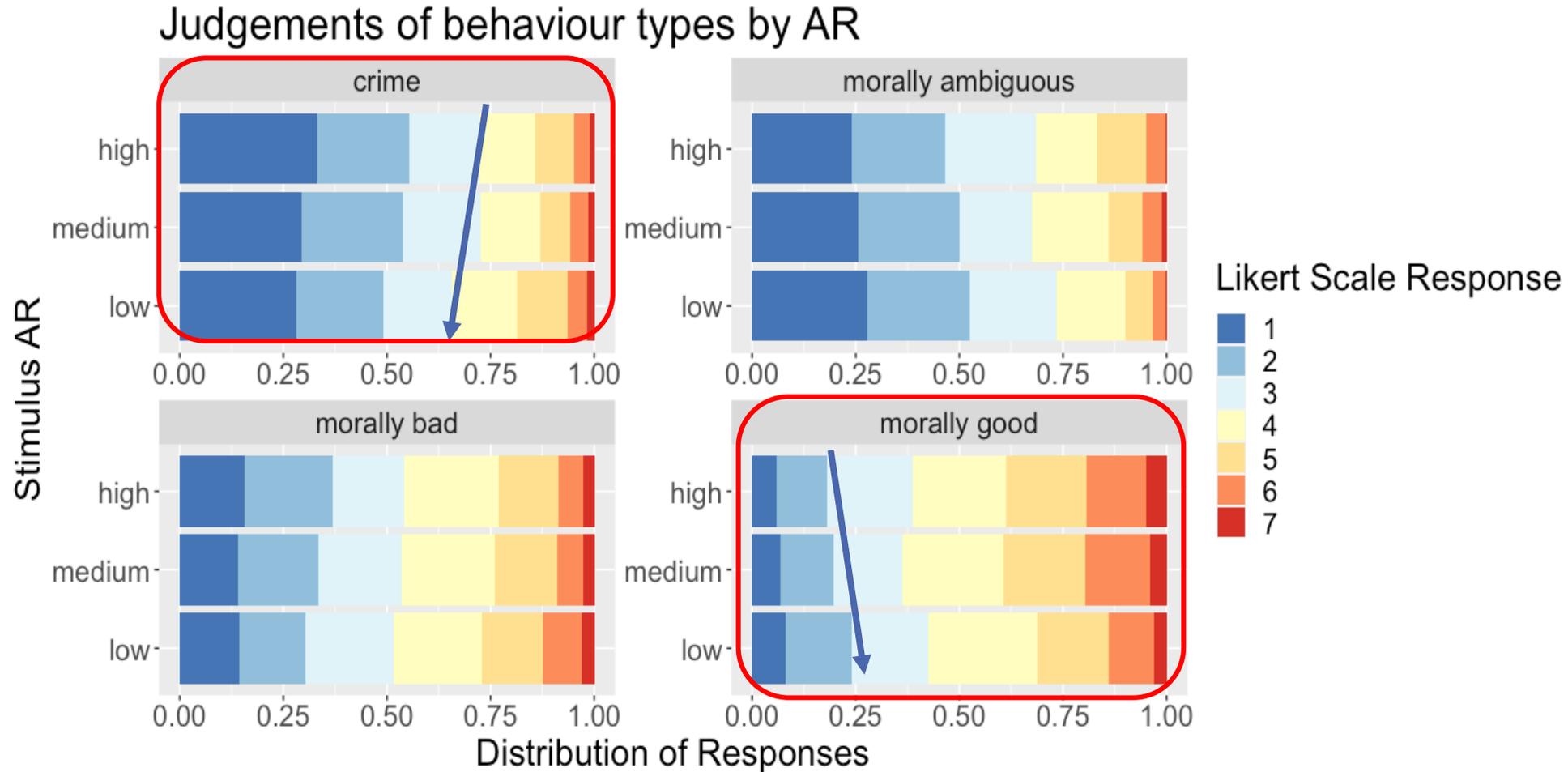
- No effect of pitch for behaviours
- Same or similar effect of accent as previous experiment





# Results: Experiment 2 (AR)

- Low AR → high criminality, low morally good
- Same or similar effect of accent as previous experiment



# Discussion & further issues

# Discussion & Implications



- Effect of accent follows trend of preceding study
  - Non-standard accents rate less favourably for status & crime, but more for solidarity.
  - Moral behaviour ratings also patterned in a similar way as before.
- **Pitch** was only found to have effect on **ratings for traits, not behaviours.**
  - Possible explanation of gender-based stereotypes.
- **AR** had an effect on ratings for **traits AND behaviours**
  - Related to previous associations with competency
  - Crime ratings driven by **shoplifting, sexual assault** and **vandalism**



Thank you!



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