

Forensic implications of listener ratings of speakers under pitch and rate manipulation.



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1. Background

Listeners make stereotyped judgements about people based on features of their voice including accent, pitch, & speed^{1,2,3}.

People bring prejudices about voices with them to forensic contexts. Some accents sound more guilty than others⁴, some sound more likely to commit certain crimes (e.g. blue v white collar, non-standard v standard)^{5,6}.

Previous study on British English accents: Northern English & London most criminal, lowest status. SSBE least criminal, highest status. Non English most moral, highest solidarity ratings⁶.

Research question: what judgements do people make about voices regarding

- social traits
- criminal & moral behaviours based on speaker's **pitch** and **articulation rate (AR)**?

2. Methodology

Listeners heard **3 x samples** (~15s spontaneous speech collages) of **3 UK accents** (Men aged 18-45, Belfast, Liverpool, SSBE, chosen based on previous results⁶) + 4 distractor voices.

Listeners asked to **rate all voices** on **10 traits** and **10 behaviours** using 7 point Likert scale

2 experiments (Exp1 Pitch, Exp2 AR)

- Each voice sample manipulated 3 times ('low', 'medium' and 'high' pitch/AR)
- 180 participants in each experiment, split into 3 groups to cover all samples:

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

3. Results – Exp1 (Pitch)

Social Traits:

- **Low pitched voices → lower for solidarity-based traits.**
- **High pitched voices → lower for status-based traits.**
- Regarding individual traits, **low pitched voices** were rated as **more aggressive** and **less friendly**; **high pitched voices** rated **less confident** and **less rich**.

However, mixed-effects ordinal regression model (baselines = SSBE, medium pitch) found **no significant effect of pitch on behaviour ratings** (Fig. 2)

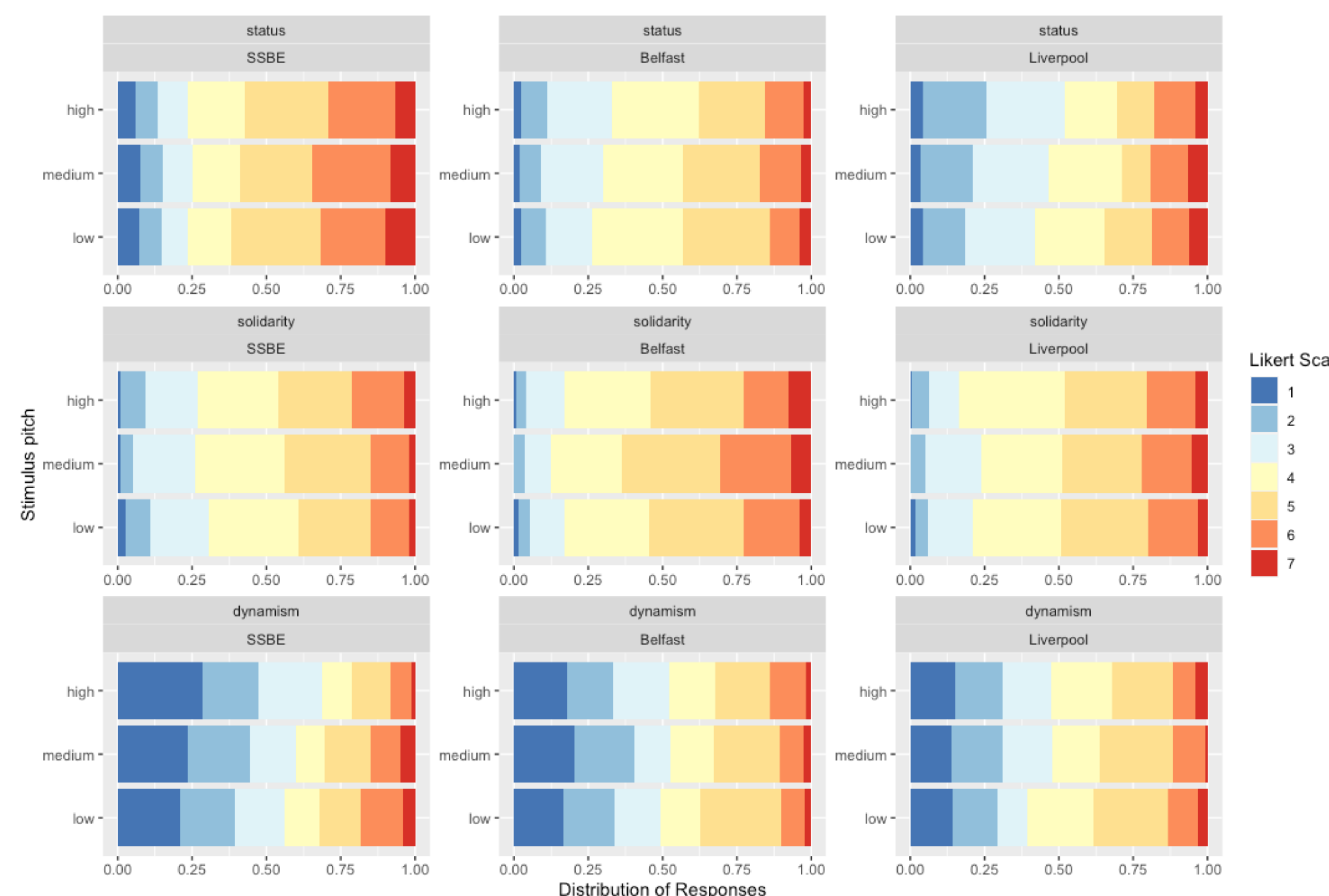


Fig 1. Stacked barplots showing the distribution of responses from participants in Exp1 for each group of traits, separated by speaker accent. The y-axis shows the stimulus pitch.

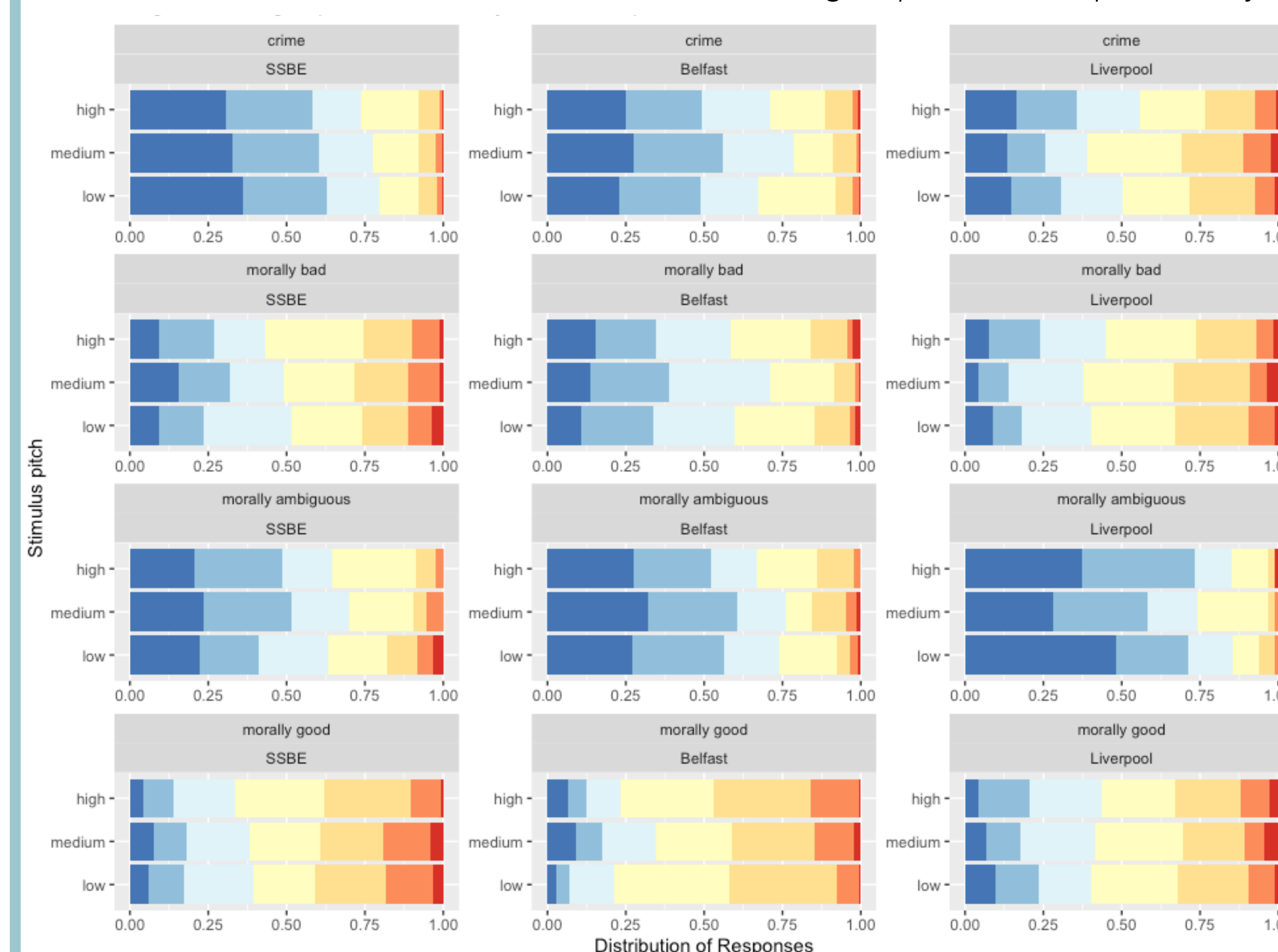


Fig 2. Stacked barplots showing the distribution of responses from participants in Exp1 for each group of behaviours, separated by speaker accent. The y-axis shows the stimulus pitch.

4. Discussion

- Effect of accent follows trend of preceding study⁶ – non-standard accents rate less favorably for status & crime, but more for solidarity. Moral behaviour ratings also patterned in a similar way as before.
- Preceding study found link between traits and behaviours for accent. Here, pitch was only found to have effect on ratings for **traits**, not **behaviours**.
- Possible explanation of gender-based stereotypes.
- Data analysis for Exp2 (AR) still ongoing. **Predictions for Exp2 results:**
 - ➔ As with Exp1, no effect of AR on behaviour judgements
 - ➔ Some effect of AR on ratings for some traits – possibly status & dynamism based e.g. intelligent & confident – but not others

Significant effect of accent found for both trait (Fig. 1) and behaviour (Fig. 2) ratings.

- **Belfast and Liverpool → more likely to commit crimes** than the SSBE speaker, **lower in status**, **higher in solidarity**
- **Belfast → less likely to perform morally bad behaviours**
- **Liverpool → less likely to be morally good.**
- **SSBE → most likely to be morally ambiguous**

5. References

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ESRC Grant Reference: ES/S015965/1

