

Capturing listeners' real-time reactions to the NURSE~SQUARE merger

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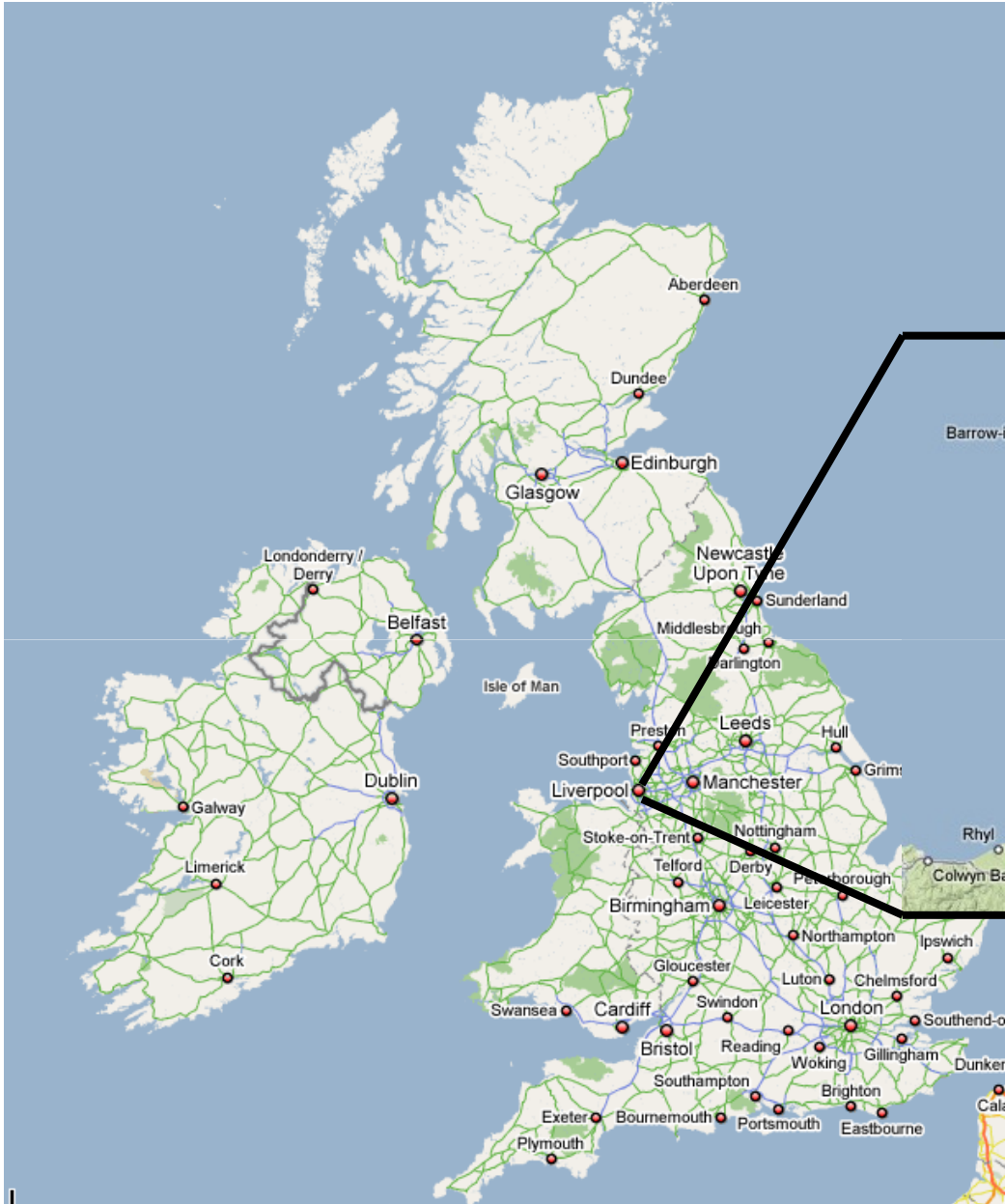
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Outline

- **AIM:** explore whether listeners' reactions to accent stimuli can be correlated with the occurrence of instances of linguistic variation (especially the NURSE~SQUARE merger)

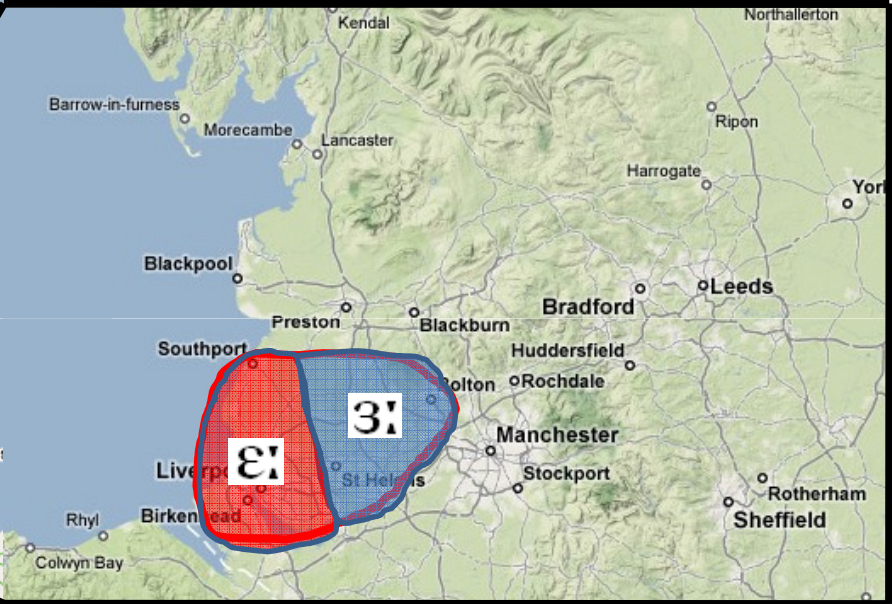
STRUCTURE:

1. What is the NURSE~SQUARE merger?
2. New methods for understanding salience
3. Results of NURSE~SQUARE experiment
4. Problems & questions for the future



NURSE/SQUARE merger

- 'her' = 'hair'
- 'fur' = 'fair'



- Merseyside: front vowel
- Lancashire: central vowel

The NURSE~SQUARE merger

- Salient?
 - ‘Performed’ by speakers writing online (Kerswill & Watson 2007) & frequently represented in Liverpool ‘folk dictionaries’ (Honeybone & Watson, in prep)
 - Cf Warren & Hay (2006) for the NEAR/SQUARE merger in New Zealand
 - Labov (2001: 27) mergers are ‘invisible’ to social evaluation
- Question: how ‘visible’ is the NURSE~SQUARE merger in NW England?

Previous approaches to eliciting attitude reactions

- Listener reactions via the matched or verbal guise technique
 - But what aspects of the speech signal trigger particular reactions?
- Campbell-Kibler (2006, 2008): manipulates the speech signal to test reactions to (ING)
- Labov et al (fc) provide listeners with a movable slide on which to register their reaction language stimuli
 - BUT only the final slider position is considered, not the movement of the slider

What do you think?

This website is part of a research project which hopes to find out about how we react to people with different accents. Thank you for visiting, and we hope you agree to take part.

Over the next few pages, you will hear short clips of two people reading some sentences. They were recorded during a telephone interview for a job in a call centre. It's important that call centre employees give the right impression to potential clients, so part of the interview process tested whether interviewees spoke with standard accents. To do this, the call centre gave each person some sentences to read aloud.

Sometimes the interviewees sounded more 'posh' than other times, and we would like you to judge whether the speaker sounds posh in each clip you listen to. There are 10 clips in total.

The sentences are a little strange so don't focus too much on what the people say, we want you to listen to what they sound like.

About this project



At the moment it is **VERY IMPORTANT** that your browser is either Firefox or Google Chrome, as Internet Explorer does not work properly.

We will also ask you to provide some information about yourself, such as whether you are male or female, and where you grew up. We will not collect any information which allows us to identify who you are which means that everything you tell us will remain completely anonymous. Your answers to the questions we ask will only be used for the purposes of our research project.

If you agree to take part, please click the checkbox below, and then click the **Let's Begin button below to be taken to the next page.**

I agree to take part in this project

Let's Begin ▶



If you would like to contact us about this project, we would love to hear from you. Email us by clicking on the links below:

Kevin Watson: k.watson@lancaster.ac.uk

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Example: how to take part

Let's get started. On the next few pages, you will listen to 10 sound clips and be asked a question about each one. **We would like you to react to the question as you listen to the clip.**

We will ask you whether you think each speaker sounds **posh**.

So you play the clip, and then as you listen to what the speaker says, we would like to know if at any point anything they say makes them sound **more posh** or **less posh**. As they talk, if you think they sound more posh, move the slider to the right to indicate this, if you think they sound less posh, move the slider to the left. Feel free to move the slider for the duration of the sound clip.

Example Audio Clip

For a demonstration, click 'play' on the clip below. If your sound is working, you will hear someone speaking.

 **Click button to play**

Move the slider with your mouse as the audio plays

Question: Does this speaker sound posh?

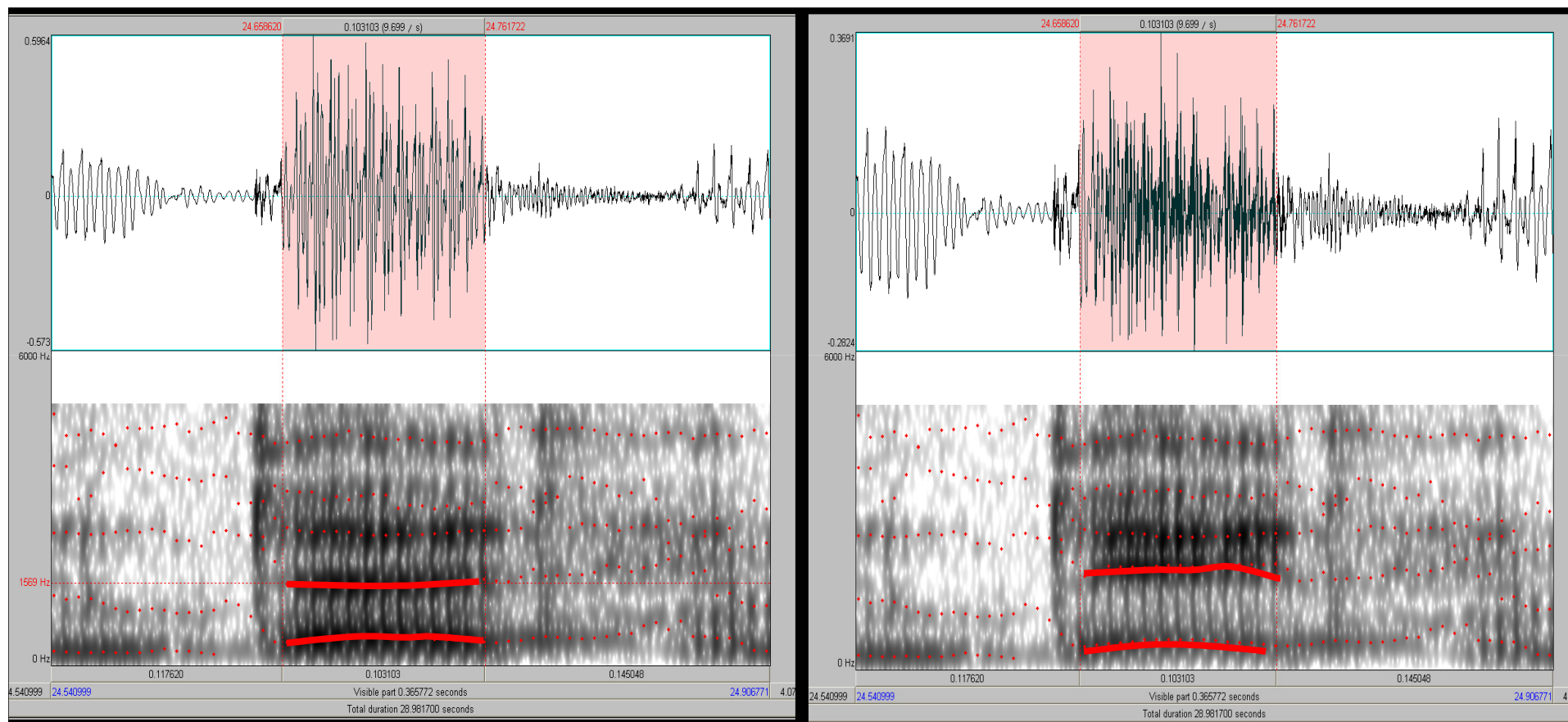


Definitely No

Definitely Yes

Centralised NURSE~SQUARE

Fronted NURSE~SQUARE



“Cursed”



“Share”



“Heard”



“Cursed”



“Share”



“Heard”

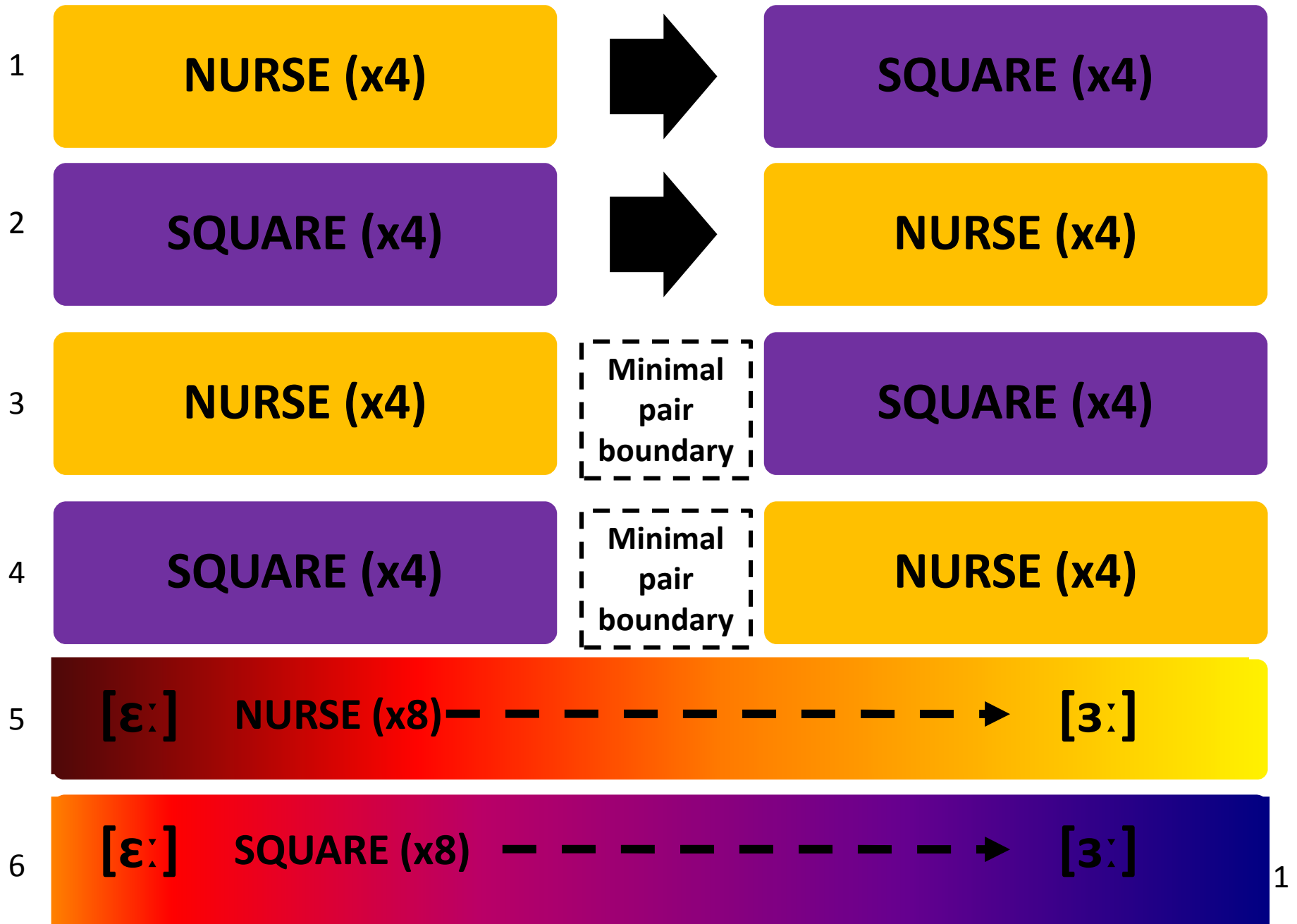
Participants

Participants contacted via the web

- previous participation in this project
- friends of friends
- no linguistic training
- facebook

	Fronted	Centralised
Liverpool	25	12
Lancashire (St Helens)	9	7
total		53 participants

Experiment design



How is a speaker with a NURSE ~ SQUARE merger evaluated on the status dimension? (Does he sound 'posh'?)

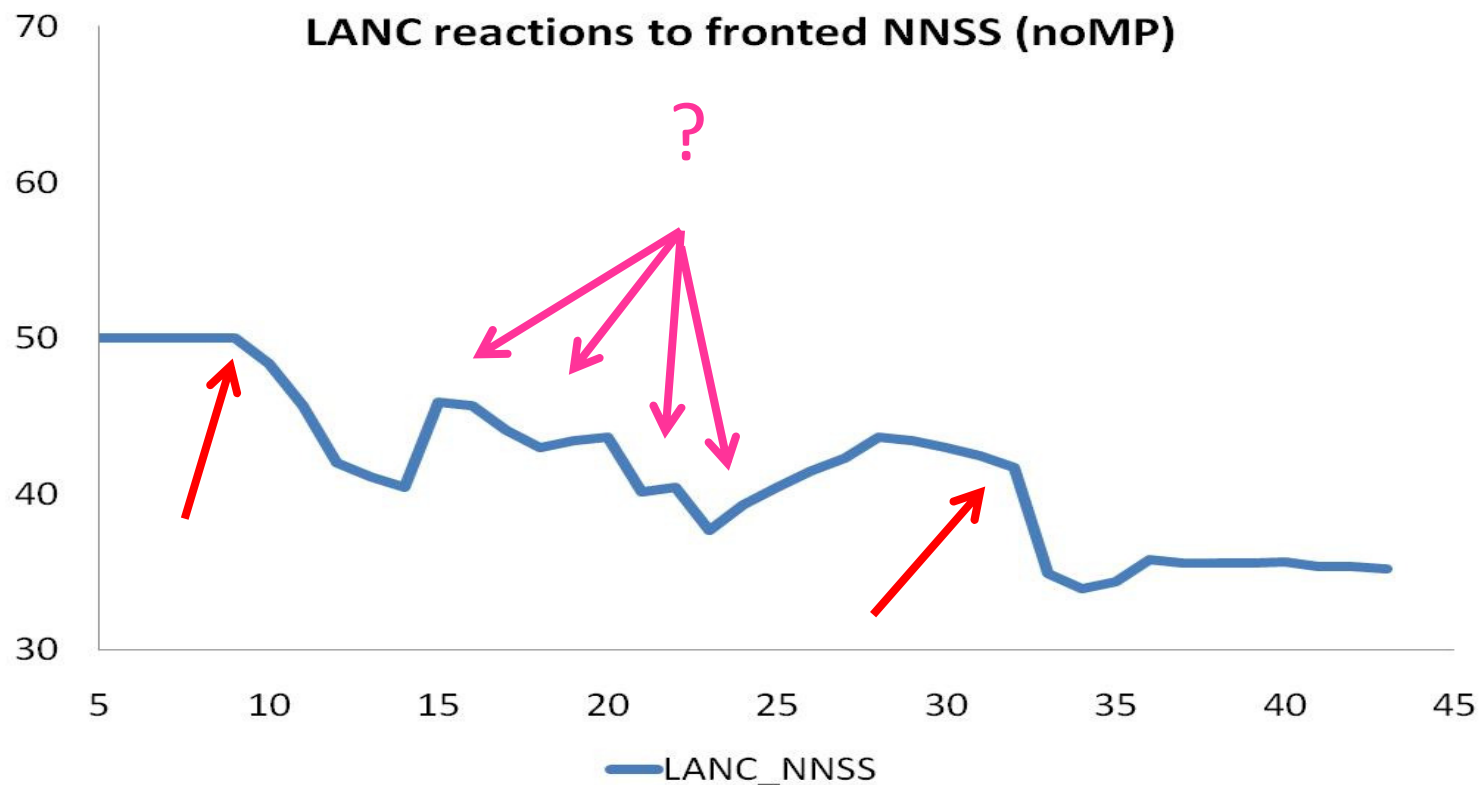
No, he doesn't sound posh...

- Regardless of whether the merger is to a front vowel (typical of Liverpool) or a central vowel (typical of Lancashire)
- Both front and central mergers evaluated equally negatively (no difference in mean or variance)
- No difference between Liverpool and Lancashire listeners' evaluation
- NURSE~SQUARE merger is a non-standard phonological feature so negative evaluations are to be expected



Overall **negatively** evaluated

Is there a relationship between the time at which these evaluations take place and instances of NURSE and/or SQUARE?



Where are the *significant* reactions?

Change Point Analysis

- Change Point Analysis (CPA) is a statistical approach which, when used with a time-ordered dataset, can identify the points at which statistical properties of the data change (Killick et al. submitted)
 - Used in a range of other disciplines including **bioinformatics** (Lio and Vannucci, 2000), **network and traffic analyses** (Kwon et al., 2006), **climatology** (Reeves et al., 2007), **econometrics** (Perron and Yabu, 2009) and **engineering** (Killick et al. 2010)
- CPA can be used to detect changes in mean, variance and regression coefficient across a stated period of time.
- Different CPA methods; here we adopt a new technique known as Pruned Exact Linear Time (PELT).
- These calculations can be carried out using the `changepoint` package available in the R environment (Killick 2011; available on CRAN).

CPA structure

	Fronted	Centralised
Liverpool	25 x 6	12 x 6
Lancashire (St Helens)	9 x 6	7 x 6
total		53 participants x 6 conditions = 318 CPAs

- Extract all significant change points
- Look for clusters in reaction time between & across groups ($\geq 10\%$ agreement)

NURSE (x4)

MP

SQUARE (x4)

FRONTED

Liv
16%
agreement

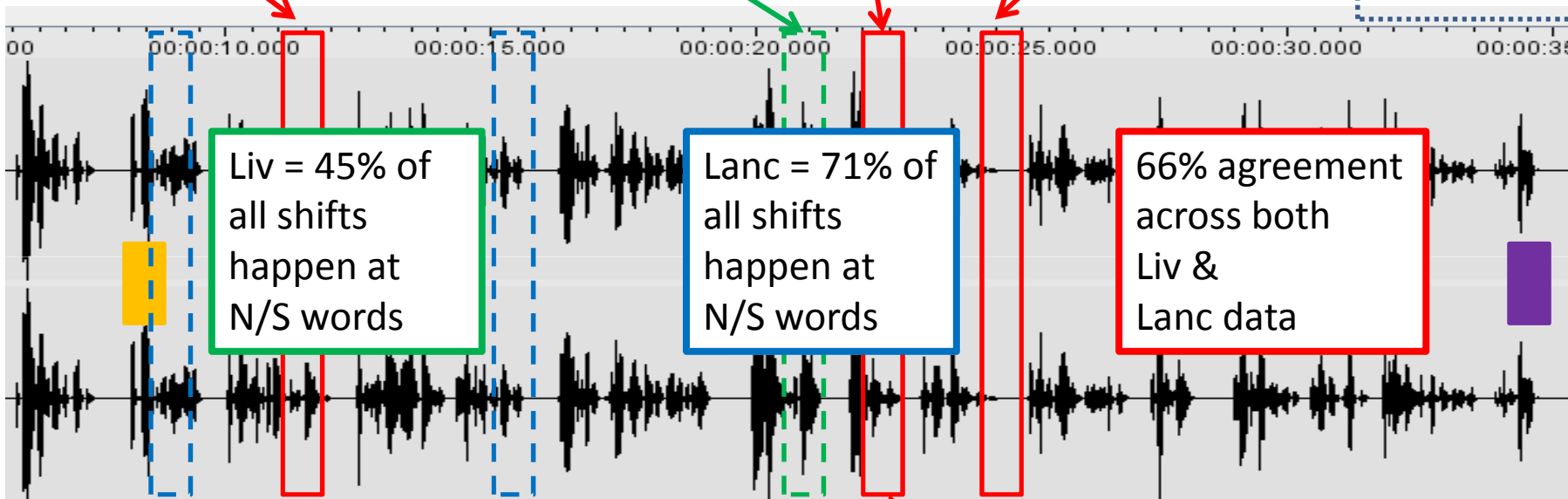
Liv
12%
agreement

Liv
10%
agreement

Liv
12%
agreement

NURSE words

SQUARE words



Liv = 45% of
all shifts
happen at
N/S words

Lanc = 71% of
all shifts
happen at
N/S words

66% agreement
across both
Liv &
Lanc data

Lanc
14%
agreement

Lanc
14%
agreement

Lanc
19%
agreement

Lanc
10%
agreement

Lanc
14%
agreement

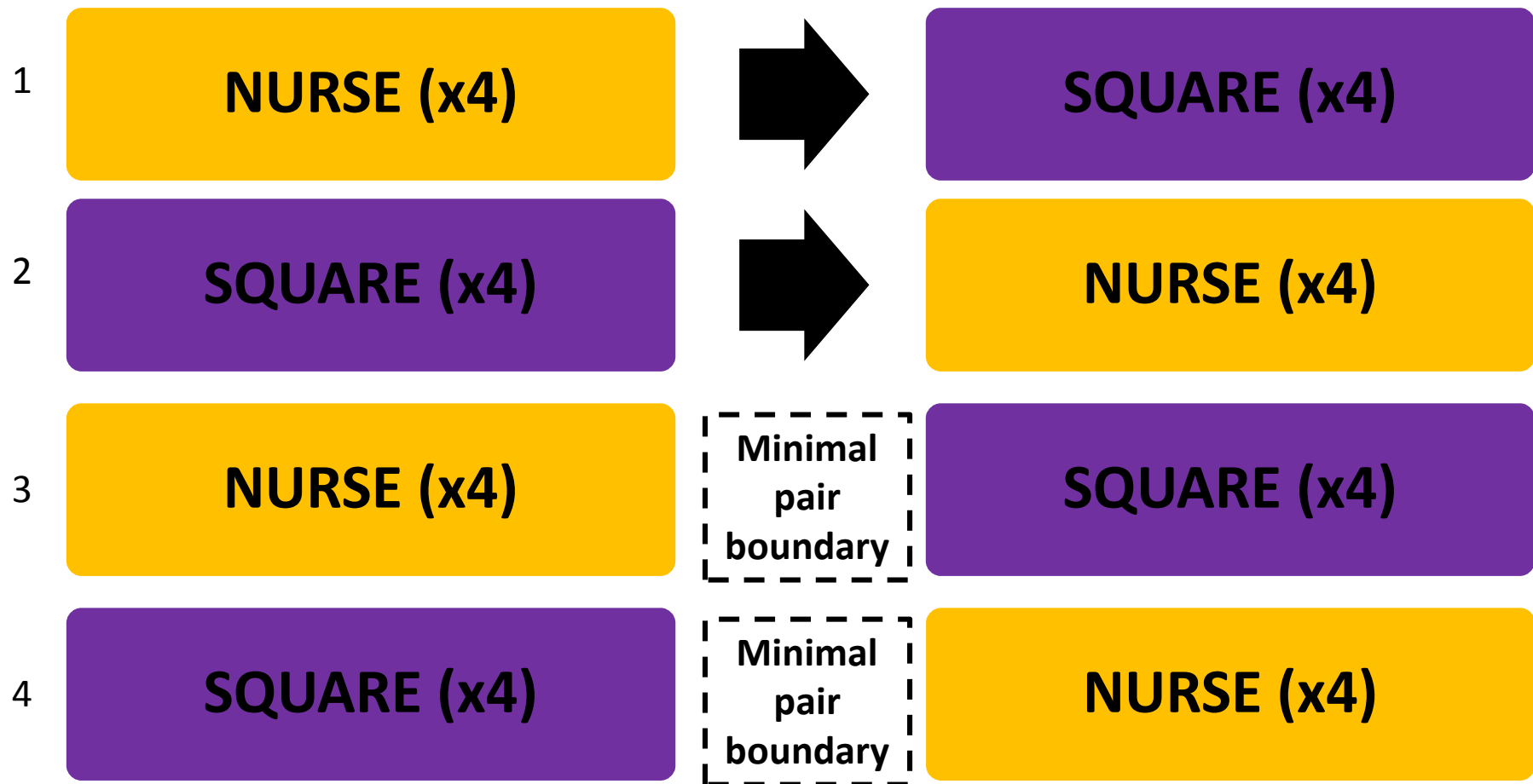
Is there a relationship between the time at which these evaluations take place and instances of NURSE and/or SQUARE?

Largely, yes

- Across all 29 change points with $\geq 10\%$ group agreement, 24 correlate with an instance of NURSE or SQUARE

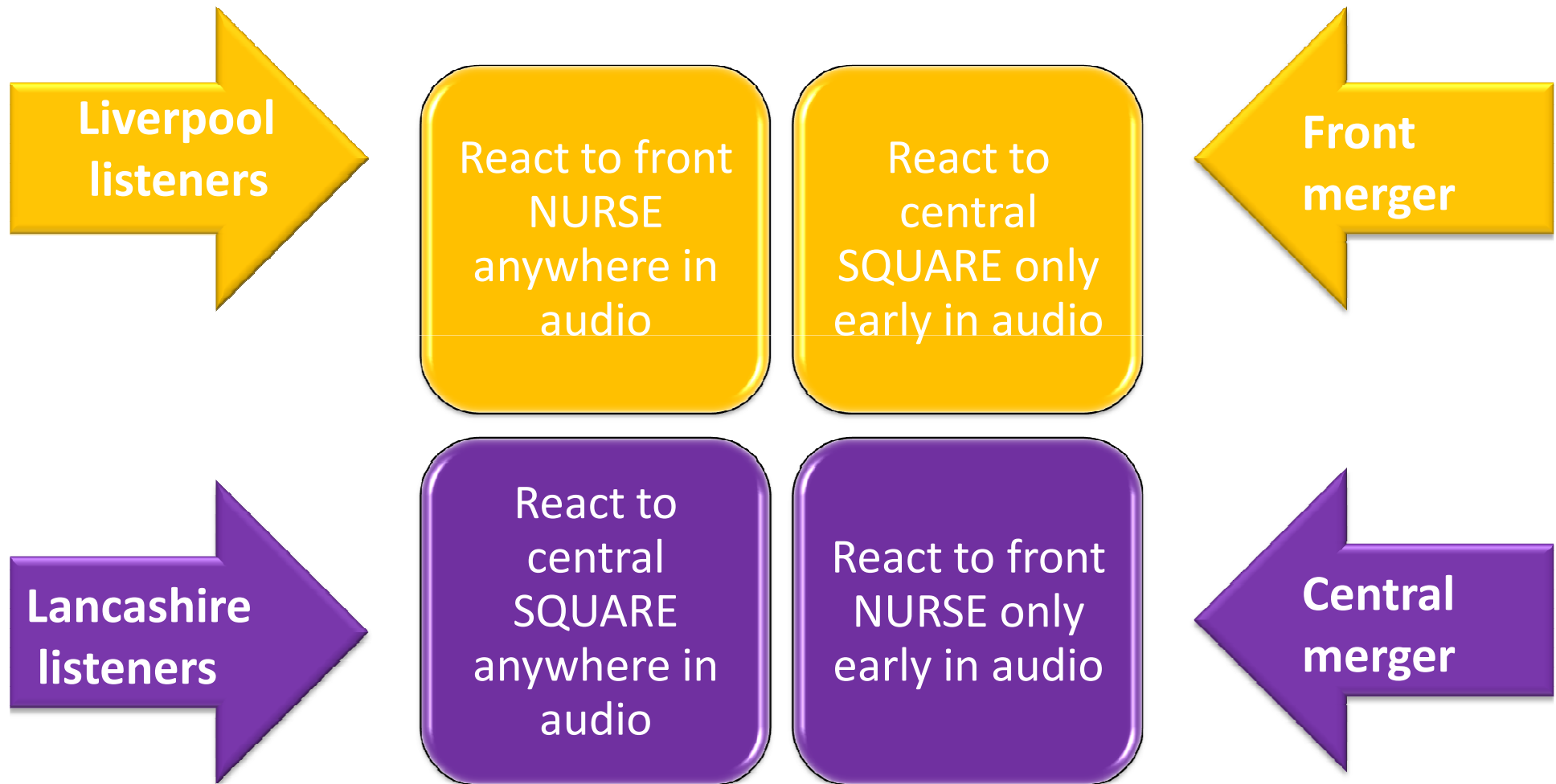
- 10 are selected by listeners from both Liverpool and Lancashire

- Good evidence to suggest that listeners are reacting to the quality of the NURSE/SQUARE vowel (i.e. the quality of the vowel is 'salient' in the non-standard lexical set)

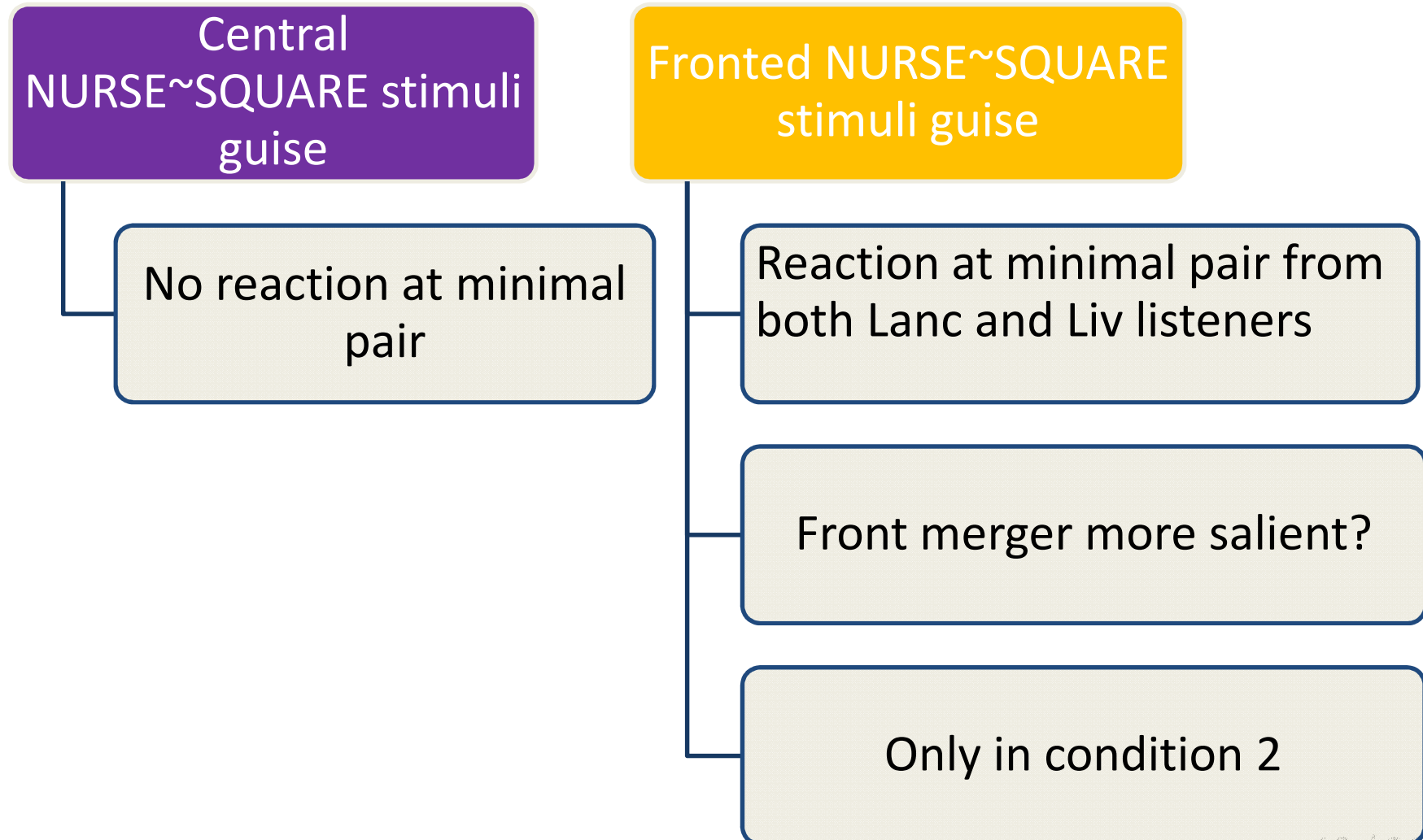


Do reactions to vowel quality depend on where the non-standard NURSE or SQUARE vowel appears in the sequence?

Do reactions to vowel quality depend on where the non-standard NURSE or SQUARE vowel appears in the sequence?



Do listeners react to the minimal pair (and so, possibly, react to the fact of the NURSE~SQUARE merger?)



Saliency and context

- Sociophonetics: usually think of saliency as a property of the variable/variant
 - Labov (1972): indicators, markers & stereotypes
 - Podesva (2006): once a linguistic unit becomes salient, it can acquire social meaning
- This experiment:
 - Saliency depends on listeners' own use of the form (usage-based model)
 - Saliency depends on the surrounding context

Problems/future work

- Pilot audio stimuli were messy; more controlled audio stimuli in this experiment bring other problems:
 - Data are ‘un-natural’ so it’s difficult to extrapolate findings to the ‘speech community’
 - Correlation \neq causation
- BUT on the plus side...
 - We can begin to carry out research which treats evaluative reactions towards language as dynamic events
 - This is a big (first) step forward

- Thanks...
 - The beginnings of this idea were sparked during a discussion with **Shaun Austin**, and we would like to thank him for his thoughtful responses and enthusiastic comments on our plans as the idea came to fruition
 - We would also like to thank **Bill Labov** for his email correspondence on this topic
 - Finally, we must thank **Rebecca Killick** for her help with CPA and, in particular, giving us access to the `changeoint` package before it was available on CRAN.

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Agreement on change points for **central** guise

	Standard vowel	Non-standard vowel	Liverpool listeners % agreement on CP	Lancashire listeners % agreement on CP
1	NNSS		No agreement on CP	18% at 2nd S word
2	NNSS (MP)		No agreement on CP	No agreement on CP
3	SSNN		19% at 3rd S word	22% agreement at 3rd S word
4	SSNN (MP)		24% 1 second after 1st S word	29% agreement at 2nd S word

Agreement on change points for **fronted** guise

	Liverpool listeners % agreement on CP	Lancashire listeners % agreement on CP
NNSS	<ul style="list-style-type: none"> •16% at 2nd N word •2 more CPs which don't cluster around N/S words 	<ul style="list-style-type: none"> •17% at first S word • 2 more CPs which don't cluster around N/S words
NNSS(MP)	<ul style="list-style-type: none"> •16% at 2nd N word •12% at 4th N word •10% at MP •10 % at pause following MP 	<ul style="list-style-type: none"> •14% at 1st N word •14% at 2nd N word •19% at 3rd N word •10% at MP •14% at pause after MP
SSNN	<ul style="list-style-type: none"> •19% 1 sec after 1st S word •14% 1 sec after 2nd S word •14 % 1 sec after 2nd N word 	<ul style="list-style-type: none"> •22% at 2nd S word •17% 1 sec after 3rd S word
SSNN(MP)	<ul style="list-style-type: none"> • 19% at 1st S word •14 % 1 sec after 1st S word •14 % 1 sec after first N word 	<ul style="list-style-type: none"> •1 CP doesn't cluster around N/S words