

Introduction

Research on deception shows that: (a) **speakers** produce *verbal and nonverbal cues* that signal deceit when lying, and (b) **listeners** attend to certain cues when attempting to recognise deceit.

Are the cues that **listeners** rely on in **perceiving deception** the same as those **speakers produce** when **lying**?

Previous work on deception

Behavioural cues to deception

1. *Pitch variation* due to various emotions associated with deception (the *emotional hypothesis* [1])
2. Increased *speech disturbances* due to greater mental load (the *cognitive hypothesis* [2])
3. *Rigid or unnatural behaviour* due to increased effort to mask deception (the *attempted control hypothesis*) [3]
4. Cue behaviour may be *more pronounced* when **speaker's motivation** increases—the *Motivation Impairment Effect* [4]

Limitations

- ▶ Inconsistencies across studies often lead to *conflicting results* e.g., [2] and [3]
- ▶ **Production studies** tend to employ *cued lying paradigms*
- ▶ **Perception studies** tend to rely on *post-hoc judgements*
- ▶ Studies frequently overlook the *interactive* component of deception

Current study

Investigate the **production** and **perception** of *verbal and nonverbal cues* to deception in an *interactive*, two-person dialogue game.

Motivations for design

- ▶ **Speakers** given *free choice* to lie or tell the truth
- ▶ **Listeners** judge speakers' utterances in *real time*
- ▶ Interactive element of task adds *ecological validity* to findings

Experiment



Participants

- ▶ 24 same-sex, native British English speaking dyads
- Two roles: **Speaker** (liar) and **Guesser** (lie detector)

Stimuli

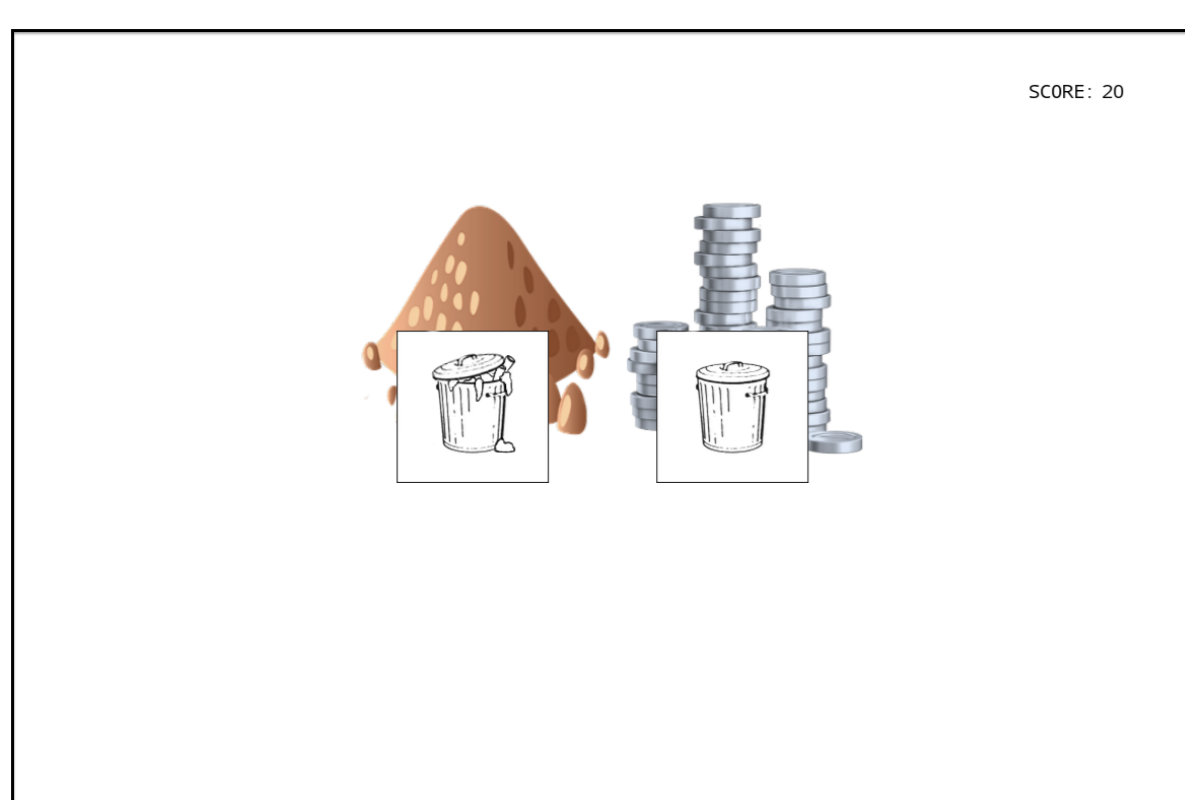
- ▶ Visually-related object pairs
- ▶ *Motivation manipulation*: Gold coins (20 points) and silver coins (5 points)

Design

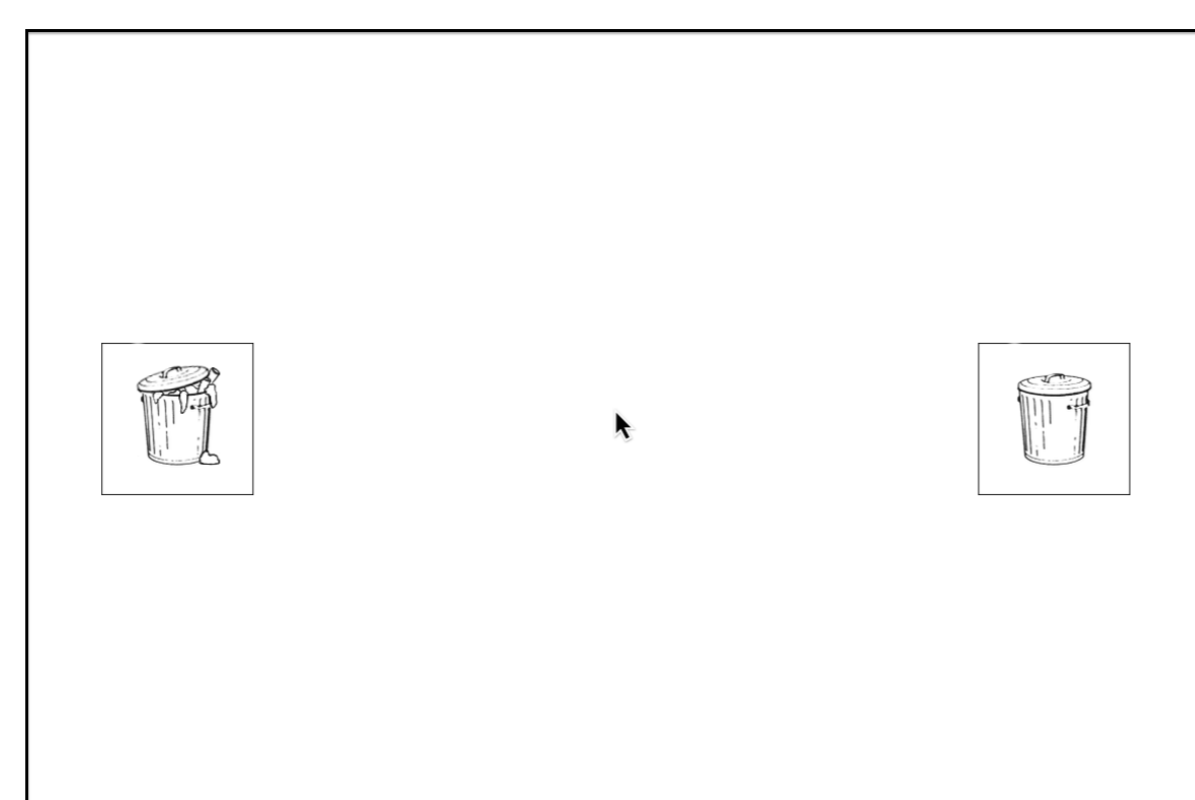
- ▶ 48 trials; 8 lists
- ▶ Objects counterbalanced for *role* (treasure/non-treasure image), *position* (treasure on left/right) and *motivation to lie* (gold/silver coins)

An example trial:

Speaker's perspective



Guesser's perspective



Task

- ▶ **Speakers** specified an object as the one concealing the treasure
- ▶ **Guessers** clicked on object with the aim to *find the treasure*
- ▶ Players awarded points for treasure retained (**Speakers**) or found (**Guessers**)
- Winner received £1 cash reward

Analysis

Verbal cues

Filled pauses	behind <i>um</i> the peeled banana
Silent pauses	behind the (.32) taller house
False start	the money is <i>th-</i> behind the one...
Repetitions	behind <i>the-</i> the cut cake
Prolongations	behind <i>thee</i> broken fence
Substitutions	behind the <i>shorter-</i> lower roof
Insertions	behind the open- <i>more</i> open book
Other speech errors	behind the squashed <i>turtoise-</i> tortoise
Silent pause dur	Total silence across utterance
Onset latency	Time taken to initiate utterance
Speech rate	Syllables per second

Nonverbal cues

Head movements
Hand movements (illustrator)
Hand movements (adaptor/other)
Eyebrow movements
Lip/mouth movements
Smile/laugh
Body/trunk movements
Shoulder movements
Gaze

Analysis: Linear and logit mixed models with maximal converging by-subject random intercepts and slopes & by-item random intercepts

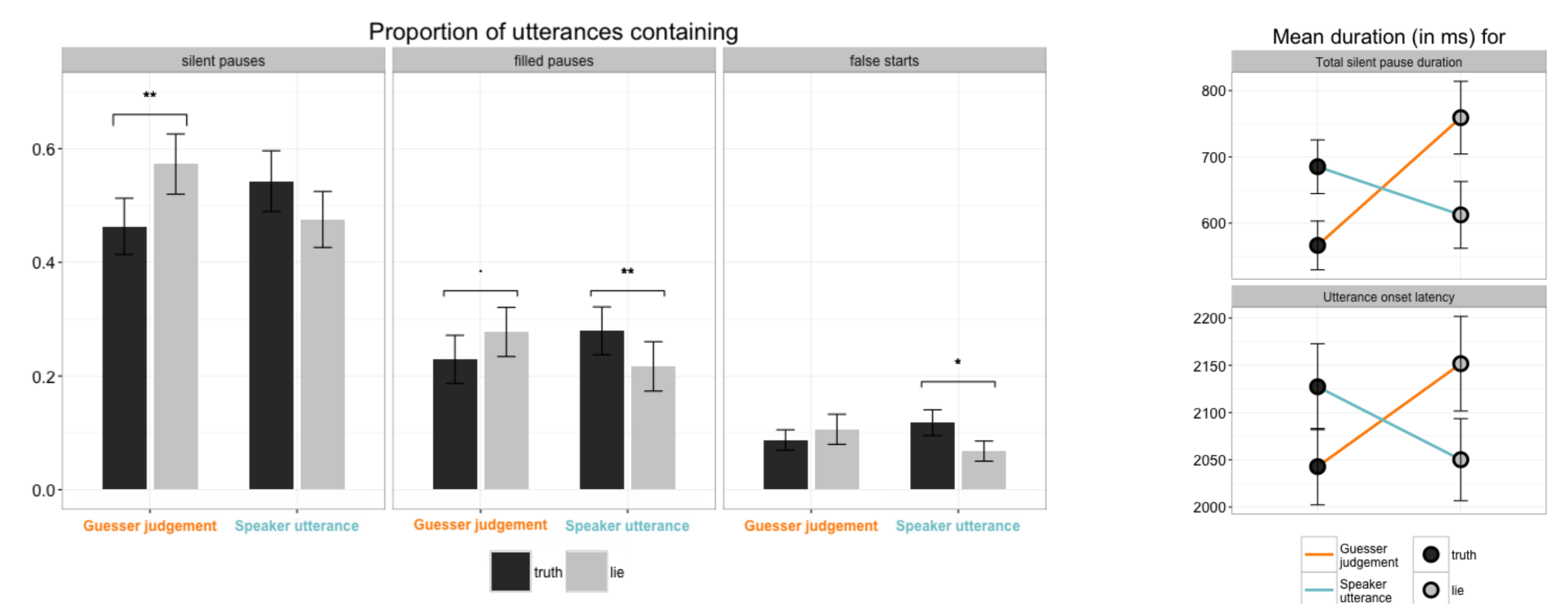
Results: Verbal cues

Guessers

- ▶ More likely to perceive utterances characterised by disfluency as lies
 - a) Silent pauses, $p < .01$
 - b) Filled pauses, $p = .07$
 - c) Silent pause duration, $p < .05$
 - d) Onset latency, $p = .08$

Speakers

- ▶ More likely to be disfluent when telling the truth
 - a) Filled pauses, $p < .01$
 - b) False starts, $p < .05$
- ▶ No effect of motivation on any verbal cues



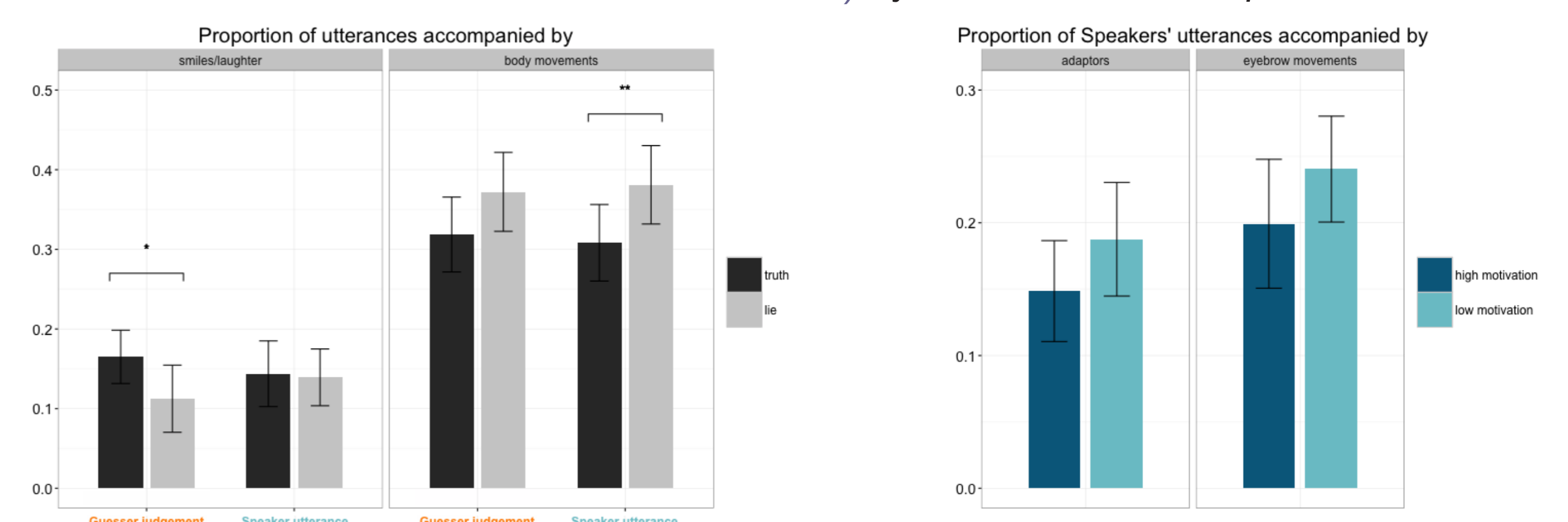
Results: Nonverbal cues

Guessers

- ▶ More likely to perceive utterances characterised by smiling/laughter as truthful, $p < .05$

Speakers

- ▶ More likely to produce body movements when lying, $p < .01$
- ▶ Lower motivation associated with an increase in
 - a) Adaptors, $p < .05$
 - b) Eyebrow movements, $p = .05$



Conclusions

1. There appears to be a *disconnect* between **Guessers' perception** and **Speakers' production** of behavioural cues to deception
2. **Gs** behaviour suggests expectations based on the **cognitive hypothesis**; **Ss** behaviour supports the **attempted control hypothesis**
3. Verbal behaviours appear *easier to control* than nonverbal (cf. Ekman & Friesen's 'leaky channels')
4. Motivation results do not support the Motivational Impairment Effect
 - May be due to *different operationalisations of motivation* across studies
 - More work would be needed to explore the motivation effect *within speakers*

References

- [1] Vrij, A., Edward, K. & Bull R. (2001). Stereotypical verbal and non-verbal responses while deceiving others, *Personality and social psychology bulletin*, 27(7), 899–909.
- [2] Vrij, A. & Heaven, S. (1999). Vocal and verbal indicators of deception as a function of lie complexity, *Psychology, Crime & Law*, 5(3), 203–215.
- [3] Arciuli, J., Mallard, D. & Villar, G. (2010). "Um, I can tell you're lying": Linguistic markers of deception versus truth-telling in speech, *Applied Psycholinguistics*, 31(3), 397–411.
- [4] DePaulo, B. M., Kirkendol, S. E., Tang, J. & O'Brien, T. P. (1988). The motivational impairment effect in the communication of deception: Replications and extensions, *Journal of nonverbal behaviour*, 12(3), 177–202.