Referential overspecification: From egocentricity to rationality

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Introduction & Hypothesis

Specificity in referential communication

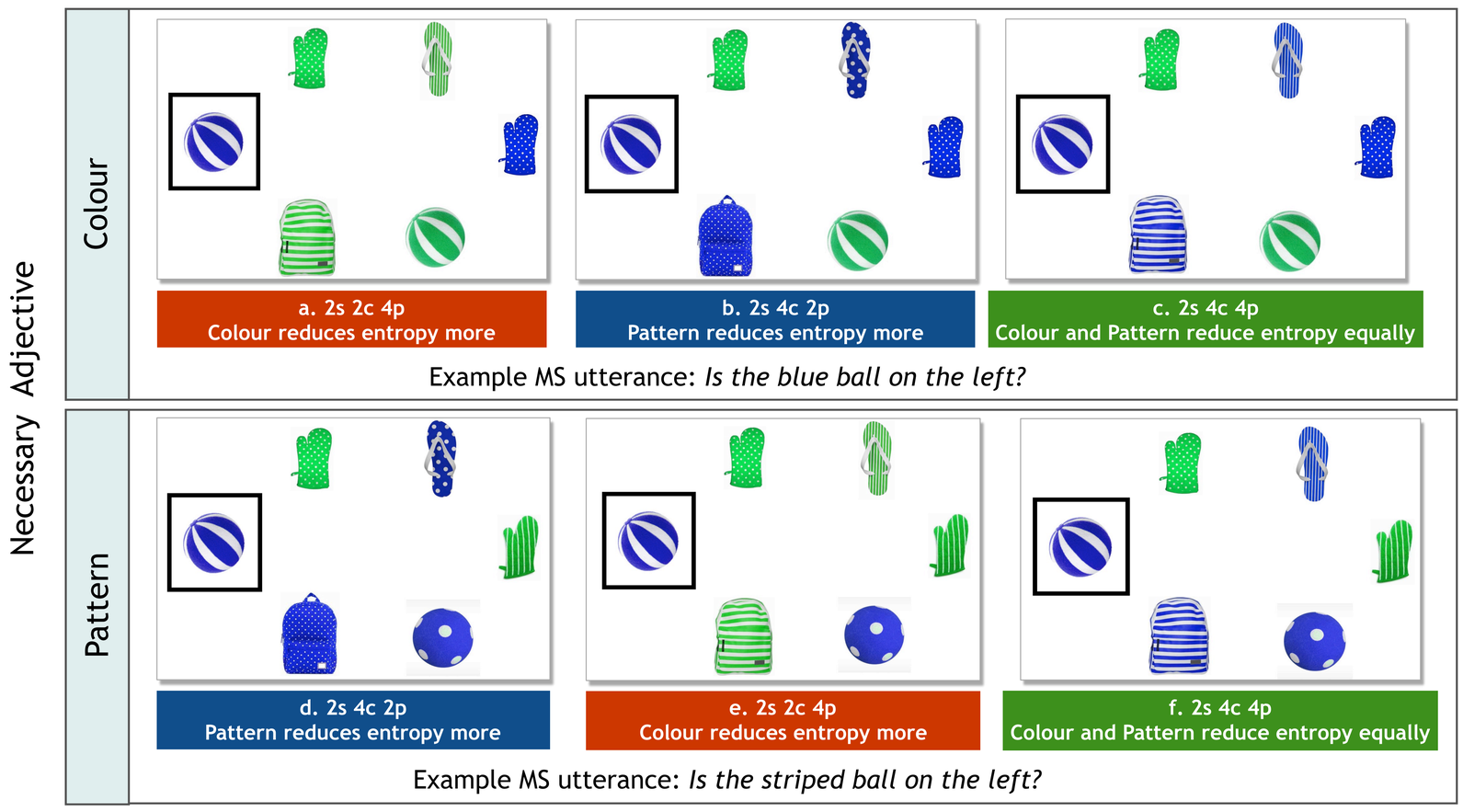
- **Grice's Maxim of Quantity** [1]: Speakers should produce only information that is strictly necessary for identifying the target
- However, it is possible to establish reference with either **minimally-specified** (MS; precise) or **over-specified** (OS; redundant) expressions
- Moreover, **speakers overspecify frequently** and systematically [e.g., 2-6]

Q: Why do people overspecificy?

Referential Entropy

- A measure of visual scene **complexity** based on the number of potential targets that are consistent with the description at a given point in the referring expression
- Incoming **words can reduce referential entropy** to a greater or lesser extent [7]
- **Overspecification facilitates processing**, in general, and even more so when it reduces entropy efficiently [8]

Hypothesis: Speakers may include redundant information in order to help listeners restrict search space, and thereby reduce cognitive effort



Methods

Participants

- 47 pairs of native German speakers (mean age = 23.7, 69 female)
- Randomly assigned to Speaker and Listener role

Task

- Speaker and Listener see same set of objects, but in different spatial arrangements
- Speaker's task: Ask which side of the Listener's screen the target object appears on

Stimuli

- Crossed **Necessary Adjective** (Colour, Pattern) X **Entropy Reduction Advantage** (Colour, Pattern, Equal)
- 6 items per condition (labels, e.g. 2s2c4p, indicate the number of objects with the same shape, colour and pattern relative to the target)
- Intermixed with 3 kinds of fillers for total of 144 trials

Predictions

- Greatest OS rate should be found when redundant adjective reduces entropy more than necessary adjective (b & e)

Exclusion Criteria

- 3 speakers > 90% minimal specifications
- 2 speakers > 15 % underspecifications (cf. <5%)
- Overspecifications primed by the immediately previous trial (i.e. identical word order) (19.67%)
- Trials containing self-repairs of adjective/noun or order/amount of information conveyed (4.42%), or underspecifications (3.85%)

Preliminary Results

Listener Accuracy

- Mean = 98.3%

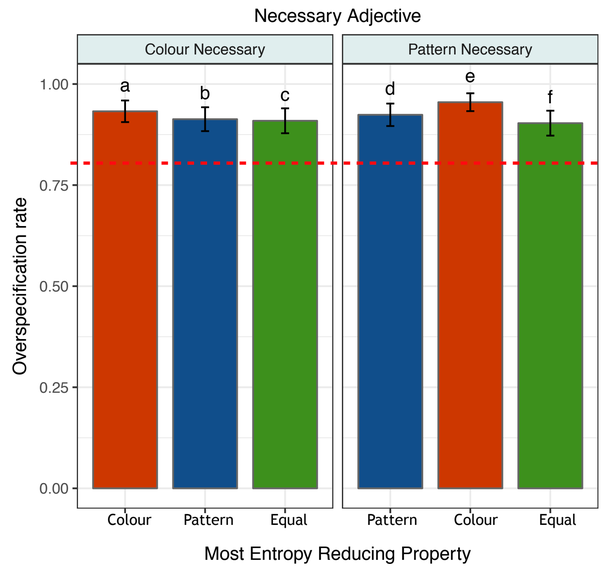
Speaker Productions

- MS = 66.41%
- OS = 33.59%

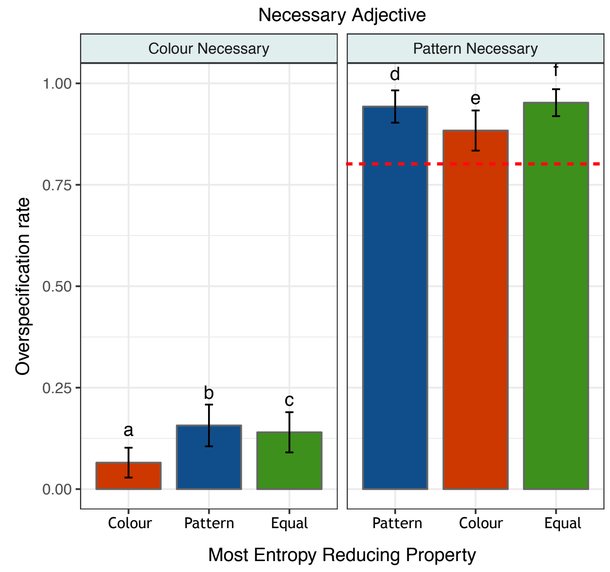
Speakers were categorised into 3 groups

- **Universal OS Group** (N=16)**:** OS rate > 80% for both Colour and Pattern Necessary items
- **Colour OS Group** (N=10)**:** OS rate > 80% for Pattern Necessary items
- **Rational OS Group** (N=16)**:** remainder of speakers

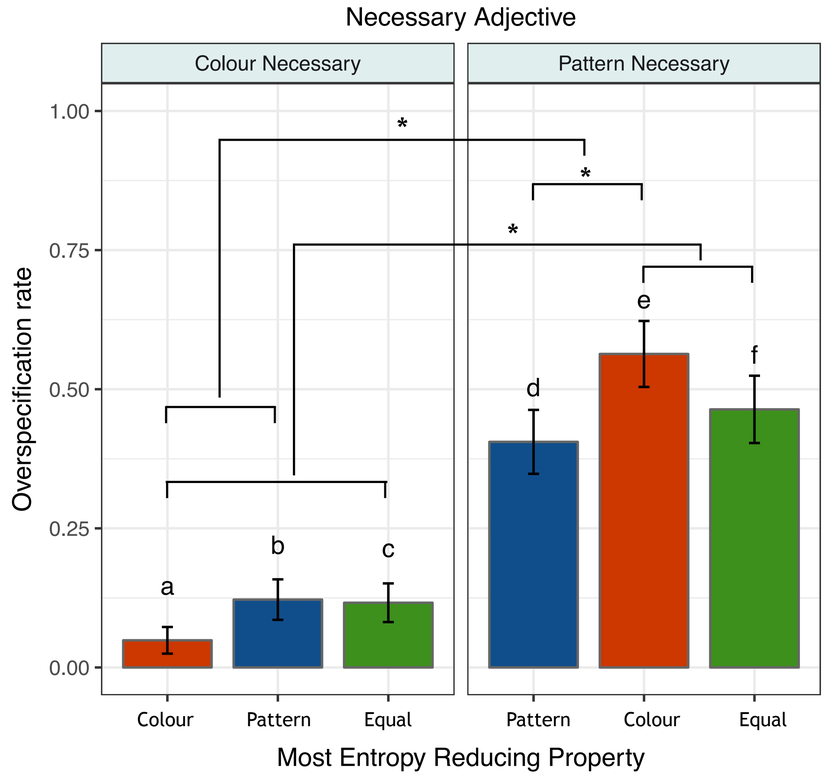
Universal Overspecification Group



Colour Overspecification Group



Rational Overspecification Group



References

[1] Grice (1975) in Cole & Morgan
[2] Pechmann (1989) *Linguistics*
[3] Arts et al. (2011) *J Pragmat*
[4] Koolen et al. (2013) *Cognitive Sci*
[5] Tarenskeen et al. (2015) *Front Psych*
[6] Rubio-Fernández (2016) *Front Psych*
[7] Hale (2003) *J Psycholing Res*
[8] Tourtouri et al. (2017) *CogSci*
[9] Frank & Goodman (2012) *Science*

Conclusion & Discussion

- Results contribute to growing evidence that speakers frequently use redundant information, and that this does not adversely affect listeners' performance (listener accuracy at ceiling)
- **Individual differences** in use of redundant information may reflect differing strategies
  - Universal OS may be a strategy to minimise speaker effort
  - Colour OS may be efficient for both Speakers and Listeners [cf. 6] due to language-wide frequency of colour modification and/or visual salience of colour [5]
  - OS may be a rational strategy when redundant information reduces entropy [cf. 9]

Ongoing Analyses

- Does the Entropy Reduction Advantage manipulation influence word order preferences?
- Does entropy reduction also influence the production of overspecifications in contexts without shape competitors (fillers in which the target shape is unique)?