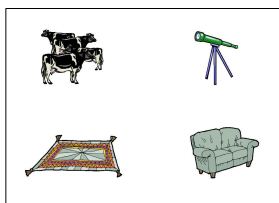


Talker Adaptation in the Resolution of Relative Clause Attachment Ambiguity

Talker Adaption – Previous Studies

- **Adaptation to talkers' (speakers') specific characteristics?**
 - Linguistic input is full of variation caused by talkers' characteristics. How do listeners cope with it?
 - Previous research has focused on **variation in phonological features** (e.g., Goldinger, 1998; Kraljic & Samuel, 2005; McLennan & Luce, 2005; Norris et al., 2003; Creel et al., 2007; Dahan et al., 2008).
 - Such features include: **VOT** (voice onset time), **phoneme categorisation for novice listeners** (e.g., distinction between /r/ & /l/ for Japanese-native English-L2 learners; distinction between /æ/ and raised /æ/ in some US English dialects) etc...

Creel, Aslin & Tanenhaus (2007)



- **Question:** Can listeners learn to use the talker identity as a cue to disambiguate the unfolding word?
- **Design:**
 - 12 cohort pairs (**COWS – COUCH:** ambiguous up to /'kaʊ/')

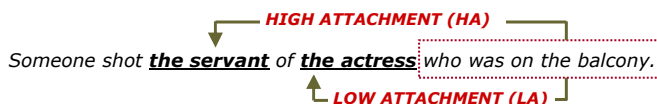
- half of the pairs: read by a single talker (**SAME-TALKER** condition); other half: read by two talkers (**DIFFERENT-TALKER** condition; e.g., Talker A always read COWS & Talker B always read COUCH)

- **Procedure:**
 - Visual-world eye-tracking with single-word presentation
 - Task: Subjects heard the word, and had to click the object the word referred to.; each item presented 20 times; 960 trials in 10 blocks

- **Results:**
 - In the last 20% trials, listeners looked at Cohort Objects less often in Different-Talker cond than in Same-Talker cond at 200-800 ms after word onset (mean word length: 560ms). No effect in the first 20% trials.
 - relatively early?? disambiguation of unfolding spoken words using the talker identity.

Present Study - Questions

- Talker variation can be found not only in phonological properties, but also in **syntactic** ones (e.g., tendency to construct sentences in one syntactic structure over an alternative).
- The present study investigates whether listeners can learn the attachment option a certain talker always produces in the ambiguity studied by Cuetos & Mitchell (1988):



Visual-world Experiment



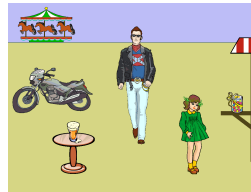
- **Ambiguity & Question:** When there is a fixed association between the talker identity and structure throughout the experiment (e.g., Talker A – **high attachment** (HA); Talker B – **low attachment** (LA)), could listeners learn the contingency?

The uncle of the girl who will ride...

- If read by Talker A: would the **motorbike** be anticipated?
- If read by Talker B: would the **carousel** be anticipated?

Design & Procedure

- Task: look and listen
- Four versions of **20** sentences based on Kamide et al.'s (2003) items:
 1. The uncle of the girl who will ride the motorbike is from France. (**HA**)
 2. The uncle of the girl who will ride the carousel is from France. (**LA**)
 3. The niece of the man who will ride the carousel is from France. (**HA**)
 4. The niece of the man who will ride the motorbike is from France. (**LA**)



- **half of items (10):** both HA and LA versions read by Talker C (**SAME-TALKER** condition)
- **other half (10):** HA versions read by Talker A; LA versions read by Talker B (**DIFFERENT-TALKER** condition)
- Talker A (male, English accents); Talker B (female, English); Talker C (female, Scottish)

- **Training Phase:** first 120 trials – 4 x 20 experimental items + 40 fillers with single attachment head (unambiguous), in 4 blocks

- **Test Phase:** last 60 trials – 2 of 4 new versions with a new verb and theme (either 5&6 or 7&8 below) x 20 items + 20 fillers, in 2 blocks:
 5. The uncle of the girl who will **taste** the beer is from France. (**HA**)
 6. The uncle of the girl who will **taste** the sweets is from France. (**LA**)
 7. The niece of the man who will **taste** the sweets is from France. (**HA**)
 8. The niece of the man who will **taste** the beer is from France. (**LA**)

* The verb was changed for the test items to ensure the effect would not show subjects simply learnt the association between the talker identity, verb and theme.

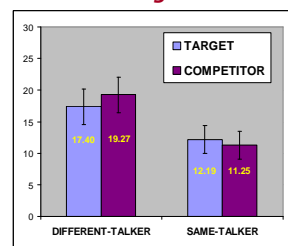
- Throughout the experiment, the following was counterbalanced for each subject: (a) the number of sentences read by each talker, (b) the number of HA/LA attachment sentences, (c) the number of trials in two talker conditions.

Results

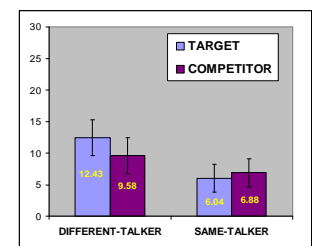
% of trials with a saccade during 'ride/taste _the_':

- **Training** - first 33% trials; **Test** - last 33% trials
- **Target** – eventual theme; **Competitor** – theme for alternative agent (for "The uncle of the girl who will ride the...(motorbike)": **Target** – motorbike; **Competitor** – carousel)
- **Note: Either Target or Competitor would make both grammatically and pragmatically correct sentences in both talker conditions.**

Training Phase



Test Phase



Training Phase:

- **Diff -Talker:** Target = Comp
- **Same-Talker:** Target = Comp
- Interaction: Talker-Cond x Object: *

Test Phase:

- **Diff-Talker:** Target > Comp ($p_1=0.029$; $p_2=0.034$)
- **Same-Talker:** Target = Comp
- Interaction: Talker-Cond x Object: \checkmark ($p_1=0.092$; $p_2=0.033$)

- **3-way Interaction:** Phase x Talker-Cond x Object \checkmark ? ($p_1=0.042$; $p_2=0.068$)

Conclusions

- Listeners can use talker identity to anticipate resolution of syntactic ambiguities if the talker has an attachment 'style' that prefers one attachment over another.
- The data are significant as they show listeners used pragmatic plausibility (who is more likely to ride the motorbike/carousel?) to resolve the global ambiguity, and hence attribute one attachment style or another to the talker.
- Future issues include: different types of ambiguity; long-term learning effects; L2 listeners; proportion of 'noise' etc...