

REFERENTIAL EFFICIENCY ACROSS ADULTHOOD: COMMUNICATIVE STRATEGIES AND COGNITIVE CONTROL

Madeleine Long¹, Hannah Rohde¹, Michelle Oraa-Ali², Paula Rubio-Fernandez²

¹University of Edinburgh, ²MIT

BACKGROUND & PREDICTIONS

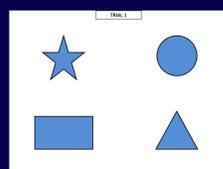
- 1 Referential efficiency is often characterized as avoidance of redundancy (e.g. Grice's Maxim of Quantity): "Make your contribution as informative as required but not more." [1]
- 2 Recent work, however, shows that an efficient speaker uses referential choices to facilitate listeners' identification of referents [2]. Thus while some contexts lend themselves to redundancy, **an efficient speaker should only be redundant when helpful to the listener.**
- 3 We predicted that in high-pressure communicative scenarios (where redundancy can *help* or *hinder* listeners' comprehension), the ability to appropriately shift communicative strategies would be modulated by **attention switching.** (Exp 1)
- 4 We predicted that in low-pressure scenarios (where redundancy matters less but where speakers need to track and recall discourse referents), **working memory** would play a role. (Exp 2)
- 5 Both attention switching and working memory tend to decline with age [3,4]. However evidence suggests good switchers of all ages tailor their speech based on their partner's needs [5]. We therefore predicted that age would not affect referential efficiency in the high-pressure scenario.
- 6 Conversely, for the low-pressure scenario, we predicted that older adults' lower working memory would be associated with a greater use of less-explicit referring expressions, in keeping with prior work [6].

EXPERIMENT 1

PICTURE-NAMING TASK

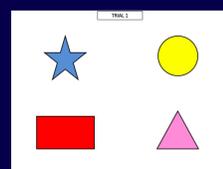
Participants ($n=100$, aged 19-82) named target objects for an addressee in displays where scenes varied [2]:

MONOCHROME



"The blue star"
Redundancy slows object identification

POLYCHROME



"The blue star"
Redundancy speeds object identification

Block order: 10 mono trials → 10 poly (or vice versa)
(Task from [2] where poly yields more color modifiers)

TEST OF EVERYDAY ATTENTION

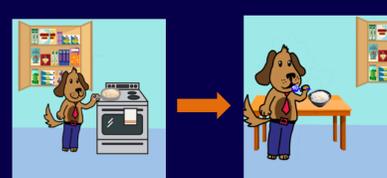
To measure attention switching, participants listened to tones. They counted middle tones, added with high and subtracted with low.

EXPERIMENT 2

STORY CONTINUATION TASK

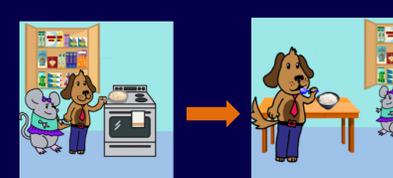
The same participants produced story continuations for an addressee in displays where scenes varied [7]:

1 CHARACTER



Doggie (M) cooked rice for dinner. "He/Doggie..."
Repeated name is less appropriate/efficient

2 CHARACTER



Doggie (M) cooked rice with Mousey (F) for dinner. "He/Doggie..."
Repeated name is acceptable for disambiguating but less efficient

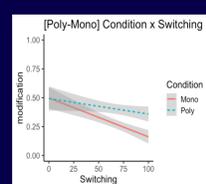
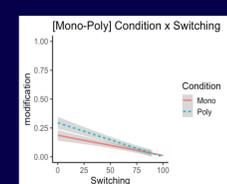
Random order with fillers interspersed
(Task from [7] where 2-character yields more names)

READING SPAN

To measure working memory, participants judged the acceptability of sentences and tried to remember the last words of those sentences.

RESULTS

LMER model of color modification (Condition, Order, Switching, Age as FE, maximal RE structure)

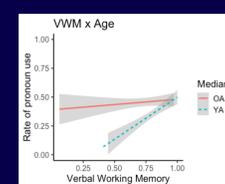


For Poly-Mono, better switching led to less modification in block 2.

Poly-Mono yielded more color over-specification and is more sensitive to switching.

Older adults over-modify in general but less so with better switching skills.

LMER model of pronoun use (Condition, Working Memory, Age as FE, maximal RE structure)



Pronouns were used more often in 1-character scenes.

Older adults produced pronouns more than younger adults.

Pronoun use varied with working memory, mediated by age: more pronoun use with greater working memory, driven by younger adults' -- not older adults' -- behavior.

IMPLICATIONS

Age-related differences in referential efficiency depend on both contextual demands and cognitive abilities, highlighting the role of individual differences in reference development across the lifespan. Moreover, those with better cognitive skills were redundant in efficient ways, suggesting that **speakers' choices reflect a pressure to facilitate the listener's processing, rather than simply to be brief.**