

Older adults' memory and audience design when speakers' representations conflict

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INTRODUCTION

- Speakers adjust referential expressions to the listener's knowledge (e.g., short labels for knowledgeable partners vs. longer descriptive expressions for naïve partners), a phenomenon called **audience design**.
- Successful audience design requires access to the partner-specific representations in memory for what a listener knows, and is less successful when the knowledge held by a partner cannot be distinctively represented (e.g., when the information shared by two partners is similar; Horton & Gerrig, 2015).
- Some evidence suggests that older adults are less successful in audience design because of memory decline (Horton & Spieler, 2007).
- Less explored is how older adults tailor audience design when engaging with multiple partners during conversation, especially when those partners do not have the same knowledge about the referential situation. **We examined young and older adults' audience design and memory in a context in which an individual must establish two different representations of the same item with two different partners.**

EXPERIMENT

- Participants:** 48 younger and older adults

	Young (N=24)	Older (N=24)	
Age	18.87 (1.33)	70.79 (4.86)	
Vocabulary	7.38 (2.65)	10.44 (3.99)	$t=3.11, p<.05$
Speed	0.70 (0.65)	-0.70 (0.66)	$t=-7.46, p<.05$
Reading Span	5.81 (1.58)	4.00 (1.99)	$t=-3.43, p<.05$
Memory	0.26 (0.78)	-0.26 (0.84)	$t=-2.23, p<.05$

- Task** (Fig. 1): Referential communication task

- Sorting (entrainment) trials: The Participant (P) and Confederates (C1, C2) view screens with the same objects but in different arrangements. P sorts all the objects 4 times each with directions from C1 and C2 to create the same arrangement.
- Test trial: P directs, alternating instructions to C1 and C2
- Memory test: P recalls item and source (e.g., who described what)

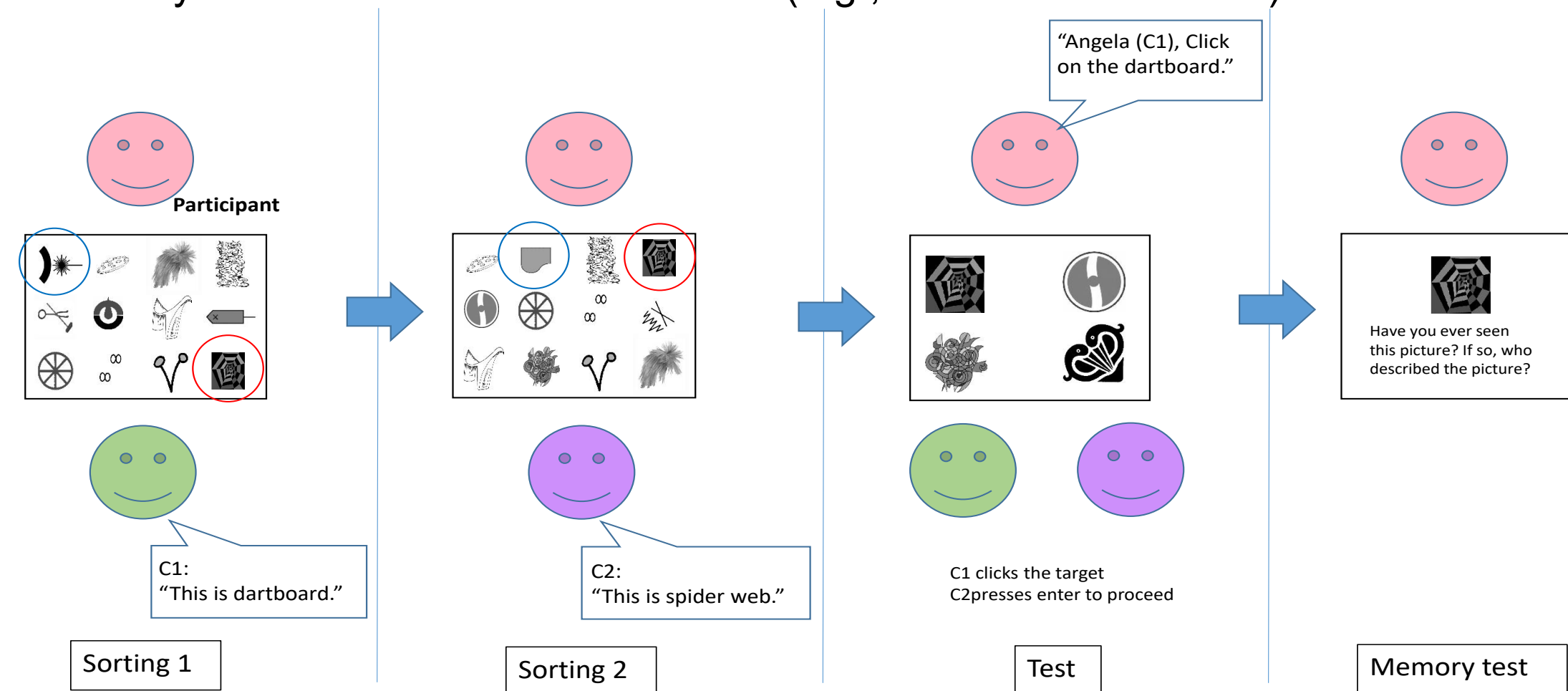


Figure 1. Procedure of the experiment.

- Critical manipulation during entrainment is that objects have...**

1 representation: P has to remember distinct labels for different objects viewed by C1 and C2; or 2 representations: P has to remember that C1 and C2 have *different labels* for the same object.

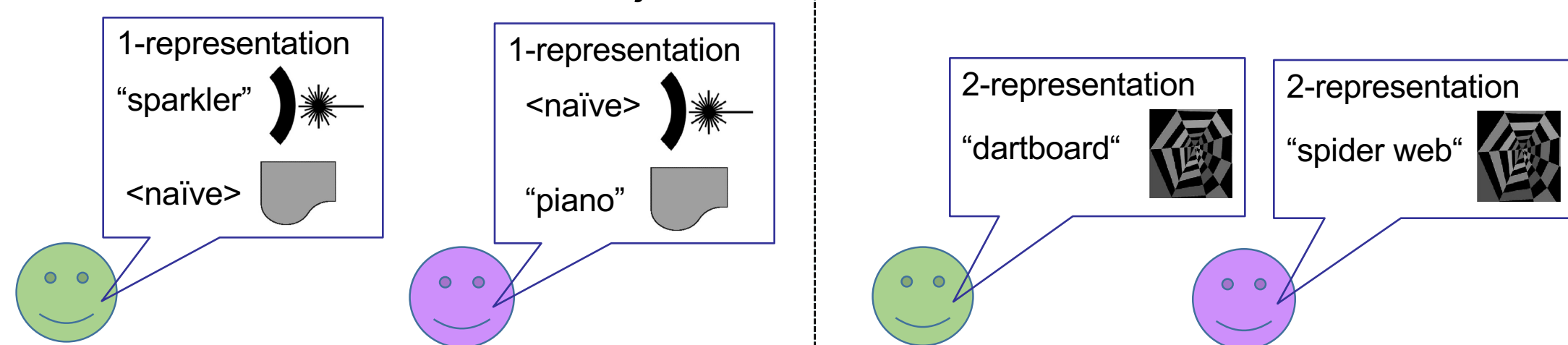


Figure 2. Examples of 1 and 2 representations shared with C1 and C2.

RESULTS

- At Test, the length of the participants' referential expressions (Fig.3)
 - were longer for the naïve partner than the knowledgeable partner ($z=8.3, p<.05$)
 - and this effect was bigger in young adults than older adults ($z=3.0, p<.05$)

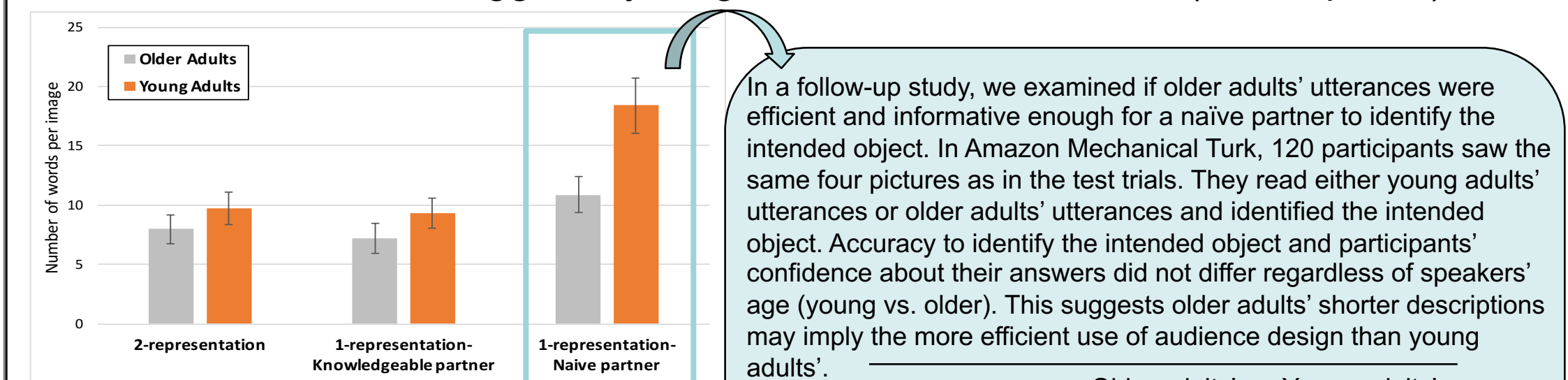


Figure 3. Average number of words used by participants on test trials

In a follow-up study, we examined if older adults' utterances were efficient and informative enough for a naïve partner to identify the intended object. In Amazon Mechanical Turk, 120 participants saw the same four pictures as in the test trials. They read either young adults' utterances or older adults' utterances and identified the intended object. Accuracy to identify the intended object and participants' confidence about their answers did not differ regardless of speakers' age (young vs. older). This suggests older adults' shorter descriptions may imply the more efficient use of audience design than young adults'.

	Older adults' utterances	Young adults' utterances
Accuracy	97%	98%
Confidence	4.20 / 5	4.23 / 5

- Entrainment at TEST:

- Shared labels were used more with the knowledgeable partner than the naïve partner ($z=-7.12, p<.05$)
- and this effect was bigger in younger adults than older adults ($z=-2.71, p<.05$)

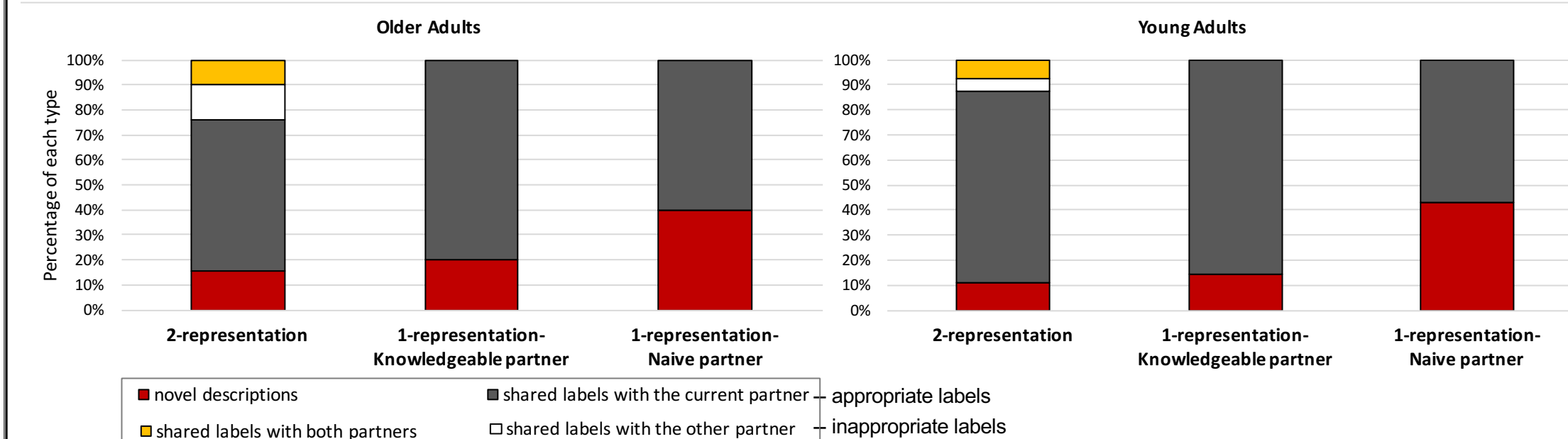


Figure 4. Proportion of entrained expressions to describe each image on test trials

- Memory test:

- item memory (e.g., Is this old or new?) – 100% (YA) vs. 99% (OA)
- accuracy of source memory (e.g., who described it for you?): Older adults showed disproportionately poor source ($z=-2.63, p<.05$)

	2-representation	1-representation
Young adults	92.78% (10.14)	87.76% (10.50)
Older adults	82.03% (24.19)	36.46% (28.94)

CONCLUSIONS

- Both young and older adults establish two distinct representations associated with specific partners and flexibly alternate them in 3-party conversation. They simultaneously adjust utterances with respect to the current addressee's knowledge state. In particular, older adults show more efficient audience design than young adults by producing shorter, but informative descriptions.
- This successful audience design was supported by notably good item and source memory in young adults, but older adults' explicit source memory was poor compared to young adults.
- This results suggest that older adults use audience design in a way that is similar to young adults even though source memory declines. One speculation is that older adults may rely on implicit memory processes to track partners in conversation.
- Our findings highlight the role of memory in audience design. Further research is needed to examine the interplay between audience design and memory particularly when memory is weakened.

- Reference: 1) Horton, W. S., & Gerrig, R. J. (2005). The impact of memory demands on audience design during language production. *Cognition*, 96, 127–142.
- 2) Horton, W. S., & Spieler, D. H. (2007). Age-related effects in communication and audience design. *Psychology and Aging*, 22, 281-290.
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