

## Memory for assertions, questions and answers in unscripted conversation

Sarah Brown-Schmidt<sup>1</sup>, Natalie Andreoli<sup>1</sup>, Susan Provenzano<sup>2</sup>, and Daphna Heller<sup>3</sup>

1. Vanderbilt University; 2. Georgia State University; 3. University of Toronto

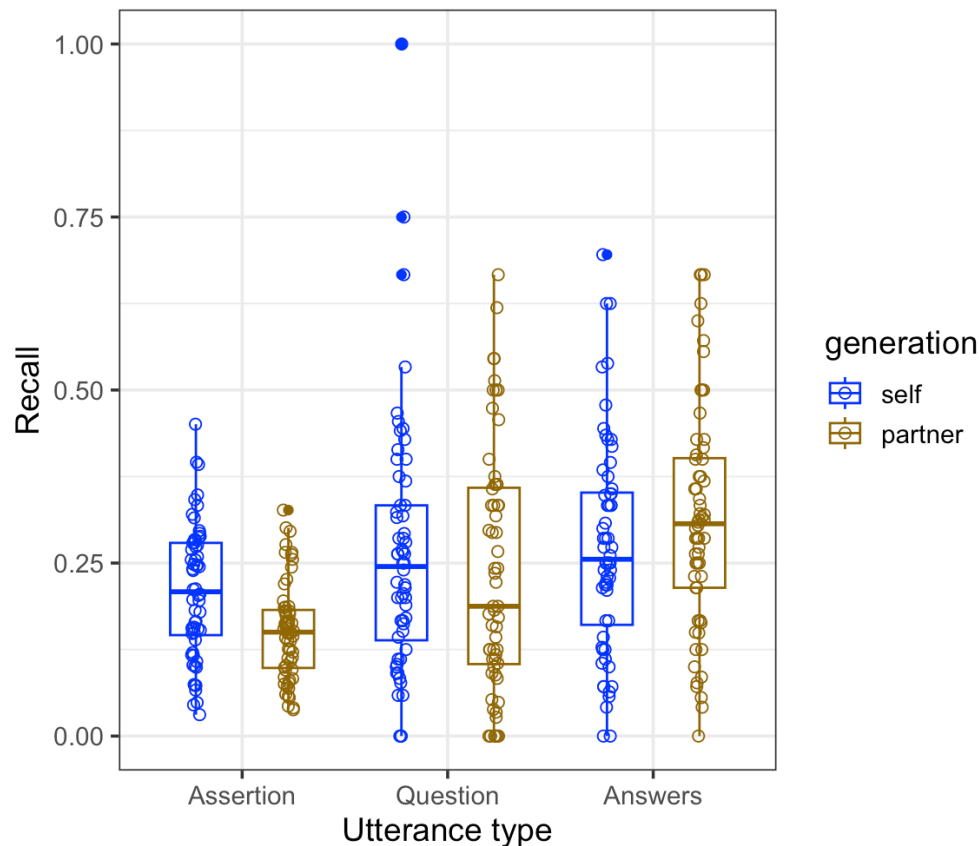
In conversation, partners exchange information using a variety of conversational moves, including *assertions* which contribute new information, *questions* which request new information, and *answers* which provide this new information. In formal linguistics<sup>1</sup>, assertions and answers both denote propositions, whereas questions denote the set of their possible answers. This latter point was mirrored in a recent proposal regarding the cognitive architecture for communication<sup>2</sup>: Questions are used when a person identifies a gap in their knowledge, but they are in a position to assume that their partner does have this knowledge. This is represented as a temporary placeholder which is filled in when the question is answered. Thus, both linguistic and cognitive accounts of questions place the thrust of the representation of a question on the potential *answers*, making the answer the focus of attention in question-answer exchanges. We predict this representational focus boosts memory<sup>3</sup> for *answers* in conversation (also see <sup>4</sup>), and further, that the interactional content of questions improves memory for them over unprompted assertion<sup>5</sup>.

**Experiment.** Pairs of participants (N=42) conversed freely in English. After the conversation, one participant (A) recalled the conversation, while the other (B) completed an unrelated task; both partners were asked to recall the conversation a week later. We previously reported<sup>6</sup> that A's initial recall enhanced their ability to recall 1 week later, compared to B. The current study uses the same dataset to test the prediction that questions and their answers will be remembered better than assertions. To this end, we coded both the original conversations and the partners' recalls, distinguishing (1) unprompted assertions, (2) questions, and (3) answers to questions.

**Results.** We examined the effect of utterance type (assertions, questions, answers) and speaker (self vs. partner) on binary recall data using GLMM, with assertions as baseline. First, questions were overall more likely to be recalled than assertions ( $b = .33, p < .0001$ ), consistent with the hypothesis that high interactional content promotes recall. In addition, answers were overall more likely to be recalled than assertions ( $b = .55, p < .0001$ ): this result is particularly interesting because both contribute new information, and only differ in their relationship to the previous conversational moves, highlighting the importance of the structure of conversation. Interestingly, we also found that the identity of the speaker had a different effect on recall depending on the type of utterance. Assertions generated by oneself were more likely to be recalled than assertions generated by the partner ( $b = .44, p < .0001$ ), replicating the well-known generation effect<sup>7</sup>. Significant interactions of these utterance form effects with generation ( $p$ 's  $< .05$ ) were due to an attenuation of the generation benefit in questions ( $b = .22, p = .07$ ) and answers ( $b = -.07, p = .56$ ), suggesting that other people's questions and answers are more memorable than their assertions. Finally, we also analyzed how accurately people recalled whether information appeared as an assertion or a question. Errors did occur, with participants misremembering questions as assertions (over 200 instances) and assertions as questions (over 70 instances). Due to the overall prevalence of assertions in the dataset (i.e., a high *base rate*), this means that if a person recalled a question, that material was originally uttered as a question ~65% of the time, whereas if an assertion was recalled, it was indeed an assertion ~95% of the time.

**Conclusion.** Recent theories posit the representational thrust of a question is in its answer; if true, we predicted that during conversation, answers would be particularly well remembered. Analysis of free recall following unscripted conversation reveals that both *answers* and *questions* are prioritized in memory compared to *assertions*, consistent with these predictions. **Real world implications.** In court, testimony about prior assertions is ordinarily excluded as hearsay. However, utterance form matters. In most federal courts, *questions* are routinely treated as non-hearsay, incapable of asserting anything true or false: the declarative statement, "*You were driving too fast.*" Would be hearsay. The question, "*Why were you driving too fast?*" would not. Our findings suggest that questions are more likely to be remembered after a delay, however memory for question form is not perfect, and sometimes assertions are erroneously recalled as questions.

**Figure 1.** Proportion of idea units that were recalled, separately by utterance form for (1) unprompted assertions, (2) questions, and (3) answers to questions. Dots indicate individual participant means at a given recall period (data are collapsed across the immediate and delayed recalls by A and B).



## References

1. Groenendijk, J. A. G., & Stokhof, M. J. B. (1984). *Studies on the semantics of questions and the pragmatics of answers* [Doctoral dissertation]. Univ. Amsterdam.
2. Heller, D. & Brown-Schmidt, S. (2023). The multiple perspectives theory of mental states in communication. *Cognitive Science*, 47(7), e13322.
3. Bentin, S., Kutas, M., & Hillyard, S. A. (1995). Semantic processing and memory for attended and unattended words in dichotic listening: Behavioral and electrophysiological evidence. *Journal of Experimental Psychology: Human Perception and Performance*, 21(1), 54–67.
4. Zormpa, E., Meyer, A. S., & Brehm, L. E. (2023). In conversation, answers are remembered better than the questions themselves. *Journal of Experimental Psychology: Learning, Memory, and Cognition*.
5. Keenan, J. M., MacWhinney, B., & Mayhew, D. (1977). Pragmatics in memory: A study of natural conversation. *Journal of verbal learning and verbal behavior*, 16(5), 549-560.
6. Brown-Schmidt, S., Jaeger, C., Evans, M.J., & Benjamin, A.S. (2023). MEMCONS: How contemporaneous note-taking shapes memory for conversation. *Cognitive Science*, <https://doi.org/10.1111/cogs.13271>.
7. Slamecka, N. J., & Graf, P. (1978). The generation effect: Delineation of a phenomenon. *Journal of Experimental Psychology: Human Learning and Memory*, 4(6), 592–604.