How Collaboration Shapes Conversational Memory Effects

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Abstract

In a dialogue, processes specific to each interlocutor and contextual features may both influence the memorization of information. This study examined how the nature of the information that is exchanged (self- or partner-produced, emotional or neutral) influences conversational memory as a function of the type of interaction (collaborative vs. noncollaborative). Results showed the replication of known effects ((self)-production and emotion effects) and highlighted the modulation of these effects by the collaborative nature of the interaction.

Keywords: Collaboration, Conversational memory, Emotions

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The purpose of this study was to examine the role of different individual and contextual factors involved in conversational memory between two partners (i.e., dialogue). More specifically, 52 participant dyads (104 participants) performed a supervised conversation task. Three factors of interest were manipulated: 1/ who provided the information (self- vs. partner-produced), 2/ content (emotional vs. neutral), and 3/ nature of the interaction (collaborative vs. noncollaborative).

Memory is crucial during dialogue (particularly the memory of what has been said), as it allows the partners to adjust their speech in the course of the interaction (Horton & Guerrig, 2005, 2016). However, three individual and contextual factors may influence memory processes. First, there is the well known (self)-production effect, whereby self-produced information is memorized better than the same information read aloud by another person (MacLeod, 2011; MacLeod & Bodner, 2017). This effect has been directly observed in several studies featuring dialogue settings (Knutsen & Le Bigot, 2014; Le Bigot et al., 2018).

Second, emotions are transitory events that modify the memorization of information (Baumeister et al., 2001; Kensinger, 2004). This emotional bias in memory has been widely documented in the literature on emotion, but few studies have examined the effect of emotions in a linguistic interaction situation. Le Bigot et al. (2018) recently compensated for this dearth of research, demonstrating a similar emotion-based effect in a conversational setting. More specifically, these authors showed that emotional verbal content is recalled better than neutral information.

Third and last, the nature of the interaction between partners in a dyadic conversation has seldom been experimentally studied thus far. Moreover, while the question of conversational

memory is inherently linked to the notion of collaboration, it has not always been studied in actual collaborative settings.

The (self)-production and emotion effects on conversational memory are ordinary effects that are both assumed to arise from the saliency of the information (Fisher et al., 2015; Le Bigot et al., 2018; Yoon et al., 2016). Self-produced (vs. other-produced) and emotionally charged (vs. neutral) information may capture more attention and, in turn, enhance memory mechanisms.

In the present study, the three factors of interest (emotion, production, and nature of the interaction) were manipulated in an experimental verbal setting. For the first time to our knowledge, we set out to examine the extent to which the (non)collaborative nature of the dialogue setting affects ordinary memory effects. In the collaborative condition, dyadic partners were instructed to produce utterances to form a coherent story together, whereas in the noncollaborative condition, no such instruction was given. We assumed that the nature of the interaction (collaborative vs. noncollaborative) would shape the (self-)production and emotion-based memory effects: collaboration would increase the memorization of all the information, making salient information that is usually not salient. We therefore expected to observe the self-production and emotion effects in the noncollaborative setting, but not in the collaborative one.

Method

Participants

Participants were 104 female undergraduate students from a French university, who were recruited in exchange for payment. Half of them were assigned to the collaborative condition, and the other half to the noncollaborative one. They were placed in pairs.

Material and Procedure

In a quiet experimental room, the dyadic partners were each seated in front of a computer screen. They were separated by a partition so that they could not see each other. The two conditions differed on instructions, but were composed of the same five phases (see Fig. 1): production (Phase

1), first interference task (Phase 2), memory assessment (Phase 3), second interference task (Phase 4), and a finalised interactive task (Phase 5). The two conditions were similar, except for the instructions in the first phase.
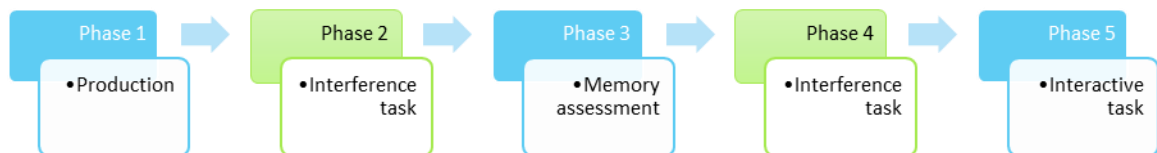

Figure 1. Illustration of study phases

During the production phase, partners took it in turns to use a noun displayed on the screen to produce a sentence out loud. Nouns were neutral or negative (n = 48 for each partner), and selected from Monnier and Syssau (2014)'s affective norms for French words, based on their valence and arousal. They did not differ on either length, degree of imageability, or frequency in books and films. In the collaborative condition, each sentence that a partner produced had to be related to the one produced by the other partner for the preceding noun, in order to create a coherent story. No such instruction was given in the noncollaborative condition.

Phase 3 served to evaluate the memory of what was said during the first phase. Each participant had to complete an individual memory content assessment, writing down as many of the nouns that had been displayed on the screen as they remembered.

Results

The dependent variable was content memory, and there were three independent variables: condition (between-participants: collaborative vs. noncollaborative), emotion (within-participants: negative vs. neutral), and production (within-participants: self- vs. partner-produced noun). Content memory corresponded to the probability of correctly recalling a noun (each noun was coded 1 if it was correctly recalled, and 0 if it was not). Main analyses were performed in SAS 9.4 using logistic mixed models (GLIMMIX procedure).

A preliminary corpus analysis confirmed that participants used more consistency markers (i.e., verbatim repetitions, anaphoric repetitions, possessive determiners, and relative clauses) in the collaborative condition than in the noncollaborative one. Figure 2 provides an example of production in each condition.
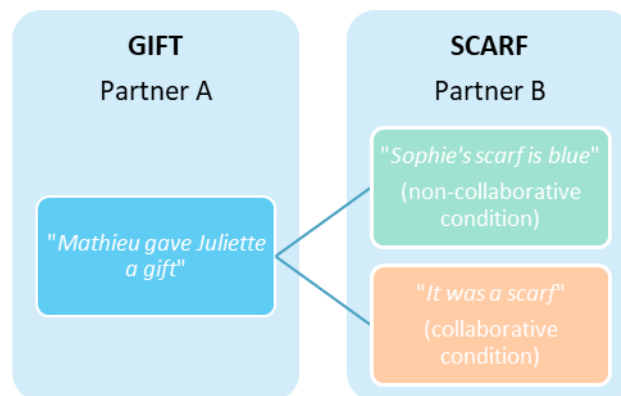

Figure 2. Examples of responses that dyadic partners gave in each condition (noncollaborative in green, collaborative in orange). In the example of the collaborative condition, Partner B uses the anaphoric pronoun "It" to refer to the gift that Partner A has just talked about.

Main analyses

The results are illustrated in Figure 3. Analyses revealed a main effect of condition, with better recall in the collaborative condition than in the noncollaborative one (OR = 1.43, 95% CI

= 1.14, 1.80), and a main effect of production, with more nouns recalled when initially self-produced rather than partner-produced (OR = 1.66, 95% CI [1.50, 1.83]). The effect of emotion was not significant (OR = 1.12, 95% CI [0.88, 1.42]).

Regarding interactions, analyses revealed an Emotion x Condition interaction: neutral nouns were recalled better in the collaborative condition than in the noncollaborative one, t(120.4) = 4.21, p = .0003, OR = 1.79, whereas there was no significant difference between conditions for negative nouns, t(113.9) = .97, p = 1, OR = 1.14. Analyses also revealed a Production x Condition interaction: although partner-produced nouns were recalled better in the collaborative condition than in the noncollaborative one, t(139.7 = 4.70, p < .0001, OR = 1.83, there was no such difference for self-produced words, t(113.5 = .91, p = 1, OR = 1.12.
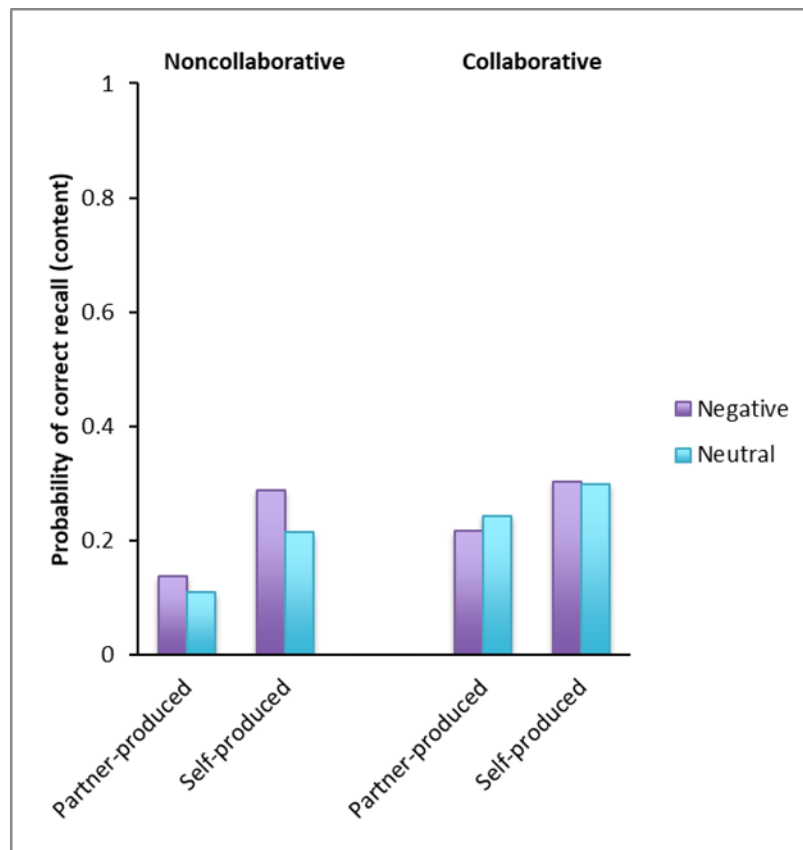
Figure 3. Probability of correct recall as a function of production (partner- or self-produced) and emotion (negative or neutral), in the noncollaborative (left panel) or collaborative (right panel) condition.

Discussion

The results of this work replicated two ordinary memory effects in a conversational memory setting: (self)-production effect (MacLeod, 2011), and emotion-based effect (e.g., Kensinger, 2004). Crucially, this novel study went one step further, as we explored the extent to which these ordinary memory effects were modulated by the (non)collaborative nature of the interaction. Consistent with our hypothesis, results showed that when partners collaborated, memory was enhanced, whatever the nature of the information (self- or other-produced, emotional or neutral). In other words, when people collaborate, all information–even information that is not usually salient–becomes salient for each partner.

Finally, this study illustrates that dialogue is a situated activity in which individual and contextual factors both play a key role.

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