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When self-construal priming influences the relationship between transactive memory and group performance

Titre français ?

*Estelle Michinov**
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Abstract

The goal of this study was to examine the effect of self-construal activation on the relationship between transactive memory and group performance. We did this by administering a self-construal (independent or interdependent) priming task to participants divided into 32 same-sex triads, which were then asked to perform an assembly task. We evaluated group performance by counting the number of task-related errors each group committed. Transactive memory was assessed by analyzing video recordings of interactions during the task and by self-report measures. As expected, the results showed that self-construal activation moderated the relationship

Résumé

Cette étude visait à examiner le rôle du concept de soi (indépendant vs interdépendant) sur la relation entre la mémoire transactive et les performances en groupe. Après avoir induit une orientation du soi indépendant vs interdépendant, les participants devaient coopérer par groupe de trois personnes (N = 32) sur une tâche d'assemblage. La performance du groupe était évaluée par le nombre d'erreurs commises lors de l'assemblage des pièces d'un robot. La mémoire transactive était évaluée à partir de vidéos filmant les communications dans les groupes, et par un questionnaire post-expérimental. Comme attendu, les résultats révèlent que l'activation

Keywords
transactive memory; group performance; self-construal; priming; collaboration.

Mots-clés
mémoire transactive, performance, groupe, concept de soi indépendant/interdépendant, collaboration

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between transactive memory and group performance. The specialization component of transactive memory was associated with fewer performance errors on the assembly task when group members had performed the independent self-construal activation task versus the interdependent self-construal activation task. Our results provide further evidence for the effects of self-construal priming on expertise recognition processes and group performance.

du concept de soi indépendant vs interdépendant modère la relation entre la mémoire transactive et les performances. La spécialisation des membres du groupe est reliée à une réduction du nombre d'erreurs uniquement dans les groupes à « orientation du soi indépendant ». Ces résultats amènent à considérer l'influence du concept de soi sur les processus de reconnaissance d'expertises et les performances en groupe.

The fact that many workplace activities are carried out in groups or teams (Kozlowski & Ilgen, 2006; Salas, Cooke, & Rosen, 2008) raises the question of how the exchange of information between group members influences a group's performance. Groups composed of people who know each other well have been found to work together better than groups of strangers (Hollingshead, 1998a, 1998b; Liang, Moreland, & Argote, 1995). A possible explanation for this is that familiarity among group members leads to the development of a transactive memory system which enables the group to make better use of each individual's expertise, thereby increasing group performance (Wegner, 1986).

Transactive memory and group performance

Wegner (1986) introduced the term transactive memory to describe shared systems for encoding, storing, and retrieving information from different domains of knowledge. His idea was that people who know each other well develop a system under which responsibility for processing information in different knowledge domains is apportioned on the basis of tacit agreement about the distribution of knowledge within the group. Recent research into transactive memory systems suggests that

knowledge held by each individual and knowledge held by other group members is connected via differentiated and integrated structures (Gupta & Hollingshead, 2010; Hollingshead, Gupta, Yoon, & Brandon, 2011; Lewis & Herndon, 2011). *Differentiated structures* concern information and knowledge that are distributed across individuals within a group ("What each group member knows vs. what I know"), whereas *integrated structures* concern information and knowledge that are common to all members of a group, that is, shared knowledge ("What we know"). Numerous studies have demonstrated the beneficial effects of transactive memory on group performance in both laboratory (Hollingshead, 1998a; Liang et al., 1995; Wegner, Erber, & Raymond, 1991) and field settings (Austin, 2003; Faraj & Xiao, 2006; Michinov, Olivier-Chiron, Rusch, & Chiron, 2008). In addition, the influence of transactive memory on performance has been shown to depend on many factors, both internal and external, that affect work groups (see Ren & Argote, 2011, for a review). For example, moderating factors may prevent a team from using its transactive memory to process information. Numerous studies have examined moderating factors such as the relationship between conflict and trust (Ashleigh & Prichard, 2012; Peltokorpi & Manka, 2008; Rau, 2005), type of task (Gupta & Hollingshead, 2010), interpersonal communication (Jackson & Moreland, 2009; Peltokorpi & Manka, 2008), and work practices, organizational values, and culture (Zhang, Hempel, Han, & Tjosvold, 2007). In contrast, relatively few studies have investigated the influence of team member characteristics such as personality traits (Pearsall & Ellis, 2006), role identification (Pearsall, Ellis, & Bell, 2010), or cognitive focus (e.g., perspective-taking vs. egocentrism, Gockel & Brauner, 2013). However, factors related to team members characteristics can affect communication and the exchange of information between team members, and the motivation of team members to engage in the collective processing of information. As Ren and Argote (2011) noted, more research is needed into the factors influencing group members' motivation to share information and use other group members' expertise. The present research suggests that one of the factors that moderate the influence of transactive memory on group performance is the orientation of the group members' self-construal.

The moderating role of self-construal

Self-construal is a central psychological construct that impacts all an individual's experiences (Cross, Hardin, & Gercek-Swing, 2011; Markus & Kitayama, 1991; Oyserman, Coon, & Kemmelmeier, 2002). It is typically defined as "how individuals see the self in relation to others" (Cross et al. 2011, p. 143). Individuals can hold both independent and interdependent views of self and these views vary both within and between cultures (Markus & Kitayama, 1991; Oyserman et al. 2002). Individuals whose self-construal is primarily independent define themselves in terms of individual or personal traits, whereas individuals whose self-construal is primarily interdependent define themselves in terms of the groups to which they belong and their relationships with others (Markus & Kitayama, 1991). What is more, individuals can activate both independent and interdependent self-construals, with the influence of each type of self-construal depending on the situational cues that are salient in a given context. Consequently, priming methods can be used to manipulate self-construal in experimental settings (e.g., Goncalo & Staw, 2006; Oyserman & Lee, 2008; Trafimow, Triandis, & Goto, 1991). Recent research has shown that self-construal priming can affect information processing and cognition, motivation, and social behavior (see Cross et al. 2011, for a review).

In an experiment investigating the effects of self-construal priming on information processing, Oyserman et al. (2008) found that priming independent or interdependent self-construal results in differential processing of both visual and auditory stimuli. For example, priming independent self-construal enhanced processing of separate components of a stimulus, whereas priming interdependent self-construal enhanced processing of the overall structure of the stimulus. In other studies of memory processes, participants who received collective priming tended to retrieve collective memories, whereas participants who received individual priming tended to retrieve events centered on themselves (see also MacDonald, Sandry, & Rice, 2012). Research into social judgments and social comparison processes (e.g., Kühnen & Hannover, 2000) has demonstrated that people with high independent self-construal strive to differentiate themselves

from others (principles of differentiation and contrast), whereas people with high interdependent self-construal try to connect to others (principles of connection and assimilation). In addition, recent studies into the effects of self-construal priming on interactions with people or with groups (e.g., Bechtoldt, Choi, & Nijstad, 2012; Goncalo & Staw, 2006) have shown that groups composed of individuals with independent self-construal favor uniqueness and the development of original ideas by each group member, and perform better on idea-generation tasks (i.e., additive task, Steiner, 1972). This result led them to suggest that individuals with an independent self-concept, focusing on their uniqueness, would be more likely to focus on individuals' expertise in the group (differentiation process), whereas individuals with an interdependent self-construal would consider their similarity to others and prioritize collective interest and seek cooperation. These results suggest that the activation of self-concept (independent vs. interdependent) in groups could influence group members' motivation to share information and use other group members' expertise.

To the best of our knowledge, one area that self-construal priming research has not thoroughly examined is the recognition of expertise and sharing of knowledge during collaborative tasks (i.e., conjunctive task, Steiner, 1972). Indeed, past research has examined the beneficial effect of independent self-construal in idea-generation tasks, which is likely to promote differentiation between individuals and very low levels of interdependence between group members. The present study represents a first step in filling this gap by investigating the effects of self-construal activation on the relationship between transactive memory structures (integrated *vs* differentiated) and group performance during collaborative tasks. We did this by priming either independent or interdependent self-construal among group members (Bechtoldt et al., 2012; Goncalo & Staw, 2006) and then assessing group performance on a collaborative assembly task (Liang et al., 1995).

Because transactive memory systems have been found to have beneficial effects on group performance (e.g., Hollingshead, 1998a; Liang et al., 1995), and because individuals with

independent self-construal are more likely to differentiate themselves from others and stress their individuality (e.g., Bechtoldt et al., 2012; Cross et al., 2011; Oyserman et al., 2002), we expected the positive effects of *differentiated* transactive memory structures ("specialization of expertise") on group performance to be stronger in groups that received independent self-construal priming, and for the positive effects of *integrated* transactive memory structures (coordination and credibility) on group performance to be stronger in groups that received interdependent self-construal priming.

Method

Participants and design

Participants were 96 undergraduate Psychology students from a French University (60 women, 36 men, M_{age}= 19.66 years, age range: 17-27 years). They were told that the purpose of the experiment was to investigate problem solving in teams and were asked to fill out a consent form. Each participant was randomly assigned to one of the conditions in a single factor design (Self-construal: independent or interdependent). The participants in each condition were then assigned to same-gender groups of three people, who did not know or who barely knew each other. This procedure resulted in 17 "independent-orientation" triads (10 female and 7 male triads) and 15 "interdependent-orientation" triads (10 female and 5 male triads).

Procedure and material

Self-construal activation. In the first part of the experiment, the participants in each triad were asked to fill in a questionnaire for an unrelated study while the experimenter finished preparing the material needed for the experiment. Each participant completed this priming task individually. We manipulated self-construal by asking participants to answer three questions about how they saw themselves compared with others (see Goncalo & Staw, 2006, for a detailed description). In the independent self-construal condition, participants had to describe the ways in which they differed from other people (i.e., priming an individualistic orientation).

In the interdependent self-construal condition, participants had to describe the ways in which they were similar to other people (i.e., priming a collectivistic orientation).

Group collaboration: training and performance. After completing the priming task, the participants in each triad were asked to work as a group and told that their performance would be filmed and evaluated. Each group completed the task separately. As in Liang et al. (1995), all the participants were informed that the three groups with the best scores would receive a prize (€45). Proposing a collective reward, rather than an individual award, reinforces cooperation between group members. The experiment was divided into a training phase and a performance phase. In the training phase, participants learned how to assemble a Meccano model (MECCANO DESIGN 6700N). Meccano models are made from a set of metal parts that are assembled using nuts and bolts. The model used for the present experiment was a mini-robot, which the participants had to complete by assembling the two arms. To help them do this, they were shown a 10-minute video explaining the procedure. We used a video explanation in order to ensure all the groups received the same information. After watching the video, participants could ask the experimenter questions. The experimenter then left the room and each group worked together for 15 minutes to assemble the model. In order to avoid any recency effect, at the end of the training phase participants were asked to complete two 5-minute interference tasks: a vowel crossing-out test and a letter-comparison test (Salthouse, Fristoe, & Rhee, 1996). The performance assessment phase was carried out immediately after the interference tasks had been completed. In this phase, the experimenter gave each group a blank sheet of paper and instructed group members to work together to recall and write down how to assemble the Meccano model (7 min.). Each group was then asked to assemble the model without instructions and told they would be evaluated on both speed and accuracy. They were given a time limit of 25 minutes. In order to add a sense of urgency, a timer was put on the table. The experimenter left the room before the groups started the task, so they received no feedback on their performance during this phase. Each group was filmed with the participants' consent.

After assembling the robot, participants were given five minutes to complete an individual post-experiment questionnaire, which asked for biographical information, including age, gender, level of education, prior familiarity with the other group members, familiarity with assembly tasks, perceived task difficulty, and perceptions of teamwork (self-reported measures of transactive memory). Finally, participants were debriefed and thanked for their participation.

Dependent measures

Group performance. As in previous transactive memory studies based on the Assembly-Task paradigm (Liang et al., 1995; Moreland, 1999), we measured group performance in terms of operational performance. The indicator was how well each group assembled the robot, which we assessed by calculating the ratio between the number of misplaced parts and the number of correctly placed parts it contained (assembly error ratio). Higher scores indicated lower performance.

Transactive memory measures. Studies of transactive memory processes have used a variety of measurement methods, with most authors favoring a multi-method approach (see Moreland, 1999). We measured transactive memory both during the task, by coding interaction behaviors from video recordings, and after the task, by including a transactive memory scale in the post-task questionnaire.

Coding transactive memory from videos. We used video recordings to code three interaction behaviors that were assumed to reflect the development of transactive memory among group members. Recordings for six of the groups had to be discarded because of poor sound quality. The remaining 26 groups were coded using a similar coding scheme to Liang et al. (1995). We coded interactions according to three categories: *task specialization*, that is, the tendency for group members to specialize in remembering different aspects of assembling the robot; *task coordination*, that is, the ability of group members to work together smoothly while assembling the robot (e.g., planning, cooperation, absence of confusion and misunderstanding); and *task credibility*, that is, how much group members trusted one another's knowledge about assembling the robot (i.e., acceptance

of procedural suggestions, absence of criticism). Two coders independently examined the videotapes and rated the groups on task specialization, task coordination, and task credibility, using 7-point scales. Higher ratings indicated a greater degree of transactive memory among group members while assembling the model. We calculated intra-class correlations (ICC) for each transactive memory dimension in order to evaluate how reliably the two judges coded the videotapes. ICCs were .84 for specialization ($p < .0001$), .62 for coordination ($p < .01$), and .83 for credibility ($p < .0001$). We averaged the two judges' ratings for each dimension.

Self-reported measure of transactive memory. In the post-experiment questionnaire, individual group members judged the quality of their teamwork by completing the 15-item Transactive Memory Scale (TMS, Lewis, 2003). The reliability and validity of this scale have been demonstrated in a number of contexts. The French adaptation of the TMS (Michinov, 2007; Michinov et al., 2008) is internally consistent and has good convergent, predictive, and discriminant validity, with a factorial structure similar to Lewis's original scale. It has three distinct dimensions (specialization, coordination, and credibility). Each item was scored on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). In the present study, the internal consistency of the transactive memory scale was good for all three dimensions (a = .80 for specialization, a = .82 for coordination, a = .65 for credibility). Thus, we summed the group members' responses for each dimension in order to give mean specialization, coordination, and credibility scores for each group. Higher scores indicated stronger transactive memory.

We checked that group members' responses were similar enough to be aggregated into a group score by calculating an intragroup agreement coefficient (Rwg). The mean $Rwg_{(j)}$ for the $TM_{specialization}$, $TM_{coordination}$, and $TM_{credibility}$ dimensions were 0.69, 0.80, and, 0.70 respectively, thereby indicating acceptable inter-member agreement (James, Demaree, & Wolf, 1993). Consequently, we aggregated the individual responses to give a single score for each group. We carried out our statistical analyses on these group-level scores.

Manipulation check. In order to check the effectiveness of the self-construal activation manipulation, two independent raters evaluated each participant's responses to the three priming-task questions. In line with the procedure used by Goncalo and Staw (2006), the raters noted their evaluations on a 5-point scale from 1 (*individualistic orientation*) to 5 (*collectivistic orientation*). We calculated mean scores for each group by summing the individual scores for the three participants in each group. The agreement between the two coders was good both at the individual level ($r = .68$, $p < .0001$) and at the group level ($r = .82$, $p < .0001$). We also checked the manipulation through two items in the post-questionnaire ("I preferred working in this group than working alone", and "I accepted the rules of the group"), adapted from existing individualism-collectivism scales (Jackson, Colquitt, Wesson, & Zapata-Phelan, 2006; Wagner, 1995).

Control variables. It seemed reasonable to assume that familiarity among group members would influence the dependent measures; therefore, we controlled for this variable in the post-questionnaire. We also controlled for other variables related to gender and familiarity with Meccano. The results did not reveal any significant relationships between the control variables and the dependent variables, so we did not analyze the influence of these variables further.

Results

Because of the non-independence of observations within a triad (see Lewis, 2003), all our analyses had to be carried out at the group-level. Moreover, we could not carry out a multilevel analysis (i.e., group-level and individual-level, cf. Snijders, & Bosker, 2012) because all three members of each triad had the same performance score (i.e., the group's collective performance on the assembly task) and the same observed transactive memory scores (observations of the groups by the judges).

Descriptive analysis and correlations

Inter-correlations and descriptive statistics are presented in Table 1. In line with previous research (e.g., Lewis, 2003; Michinov et al. 2008; Peltokorpi & Manka, 2008), the three components of

transactive memory (i.e., specialization, coordination, credibility) were not inter-correlated. The only exception to this rule was the coordination and credibility dimensions assessed from the video recordings (the components of *integrated transactive memory*). Because the dimensions of transactive memory were not highly correlated, we considered them as independent constructs. Contrary to our prediction, the self-construal was not correlated with the three components of transactive memory. Moreover, as expected, the two indicators of transactive memory (self-reported and behavioral measures) were correlated, $r(26) = 40, p < .04$.

Table 1: Means, standard deviations, and inter-correlations between the main variables

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10
1 – TMS (SR)	50.71	5.12	–									
2 – TMSspe (SR)	14.86	2.77	.76***	–								
3 – TMScoord (SR)	16.24	3.30	.72***	.20	–							
4 – TMScred (SR)	19.61	1.65	.39*	.27	-.12	–						
5 – TMS (video)	4.74	1.02	.40*	.34	.31	.05	–					
6– TMSspe (video)	4.90	1.29	.40*	.17	.42*	.07	.65***	–				
7 – TMScoord (video)	4.50	1.10	.37*	.30	.32	-.04	.88***	.30	–			
8 – TMScred (video)	4.87	1.47	.24	.34	.07	.05	.86***	.22	.79***	–		
9 – Task performance	0.56	0.56	-.40*	-.32*	-.31	-.12	-.29	-.28	-.26	-.14	–	
10 – Self-Construal	-	-	.26	.21	.09	.10	.01	.08	-.08	.05	.25	–

Note. *** p < .001. ** p < .01. * p < .05. SR: Self-report measure of transactive memory. Task performance: standardized scores.

Manipulation check

First, we examined the effect of the self-construal priming task on the participants' groups degree of individualism-collectivism. A univariate analysis of variance revealed a main effect of self-construal manipulation, $F(1, 32) = 89.70$, $p < .0001$, $\eta^2 = .74$. The judges evaluated the responses of participants as more individualistic in the independent self-construal condition ($M = 2.03$, $SD = .44$) than in the interdependent self-construal condition ($M = 3.83$, $SD = .63$). The results of an ANOVA on participants'

groups responses to the post-questionnaire were consistent with those of the self-construal manipulation, with preference for working in groups being greater among participants in the interdependent condition (M = 3.64, SD = .81) than among participants in the independent condition (M = 3.17, SD = .67), $F(1, 32) = 3.23$, $p = .06$, $\eta^2 = .10$. In addition, acceptance of group rules was greater for participants in the interdependent condition (M = 3.86, SD = .37) than it was for participants in the independent condition (M = 3.57, SD = .39), $F(1, 32) = 4.55$, $p = .041$, $\eta^2 = .13$.

The effect of self-construal on the relationship between transactive memory and performance

Our hypothesis was that the relationship between transactive memory systems and group performance would be moderated by the self-construal activation (independent versus interdependent). We tested this hypothesis by carrying out hierarchical multiple regression analyses in order to assess whether group performance (error ratio, z-score) was predicted by transactive memory components (i.e., specialization, coordination, and credibility), independent versus interdependent self-construal (coded -1, +1), or the interaction between these variables. The interaction term was calculated from the product of the variables. In order to avoid any possible multicollinearity problems, we centered the variables before calculating the interaction term (Aiken & West, 1991). We entered the main effects of the transactive memory components and self-construal variables in the first step, and the interaction term in the second step. One of the advantages of this type of analysis is that the impact of one variable can be studied while controlling for the effects of other factors in the equation (Field, 2013). In addition, because the different components of the transactive memory system were not correlated, there was no danger of multicollinearity effects. Therefore, we were able to enter the components separately (Field, 2013).

For the video-derived measure of transactive memory, we analyzed the data for the 26 groups that provided useable videos. Our results partially supported our hypothesis, as the moderating effect of self-construal was mostly due to the specialization component of transactive memory. The first step of the hierarchical regression analysis yielded a significant overall

model, R^2 = .20, F (2, 25) = 2.91, p = .05 (see Table 2). Also in line with our predictions, the introduction of the interaction term in the second step led to a significant increase in the amount of variance explained, R^2= .18, F(3, 25) = 4.39, p = .014.

In order to explore the nature of the interaction, we conducted separate simple slope regression analyses within the independent (+1) and interdependent (-1) self-construal groups, and the high- and low-specialization groups. Because the specialization variable is a continuous measure, we followed the procedure recommended by Aiken and West (1991) and Fitzsimons (2008), who suggested performing a spotlight analysis at plus and minus one standard deviation from the mean of the specialization scores (means +/- 1 SD: low specialization = 4.26, high specialization = 5.54). These single slope analyses revealed that the beneficial effect of specialization on group performance occurred only in the independent self-construal condition, R^2 = .33, F (1, 13) = 5.99, b = -.58, p = .031 (Figure 1 and Table 2). The specialization component did not predict assembly errors in the interdependent self-construal condition, b = .003, *ns*. In addition, we did not obtain a significant effect of self-construal activation for the low-specialization groups (b = .71, p = .072) or for the high-specialization groups (b = .19, p = .629).

For the other coded components of transactive memory (coordination and credibility), we did not obtain any significant results. Contrary to our hypothesis, the activation of interdependent self-construal did not interact with integrated transactive memory structures.

Predictor variables	**Transactive memory (video)**					**Transactive memory (scale)**				
	B	*SE*	*β*	R^2	R^2	*B*	*SE*	*β*	R^2	R^2
Step 1				.20*					.21*	
Specialization (SP)	-.25	.15	-.31 †			-.14	.06	-.39*		
Self-construal (SC)[a]	.37	.20	.36 †			.33	.17	.34 †		
Step 2				.38**	.18*				.32**	.09*
SP	-.36	.15	-.44*			-.13	.06	-.37*		
SC	2.15	.74	2.05**			.33	.16	.34*		
SP X SC	-.36	.15	-1.74*			-.12	.06	-.34*		

Note. [a] Independent = +1, Interdependent = -1.
† p < .10. * p < .05. ** p < .01

Table 2: Regression of assembly errors on transactive memory (specialization component) and self-construal.

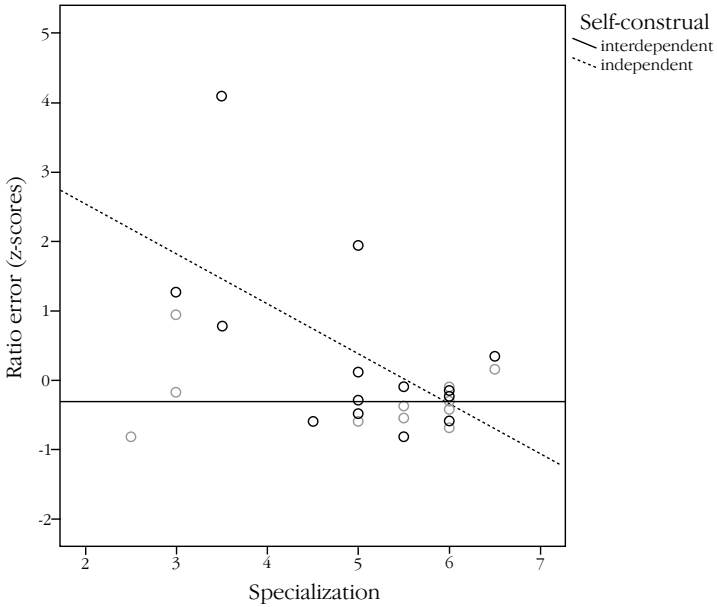

FIGURE 1: Mean assembly error scores as a function of self-construal (interdependent vs. independent) and specialization among group members

Furthermore, this moderating effect of self-construal on the relationship between transactive memory and group performance was replicated with the measure of self-reported transactive memory. The multiple hierarchical regression analysis yielded a significant overall model, $R^2 = .21$, $F\ (2, 31) = 3.86$, $p = .03$ (see Table 2). In line with the classic main effect of transactive memory on group performance, specialization scores strongly predicted assembly errors (b = -.39, $t = -2.31$, $p = .028$), with groups whose transactive memory was less well established making more assembly errors. Self-construal was marginally related to group performance (b = .34, $t = 1.99$, $p = .056$), with the groups in the independent self-construal condition making more assembly errors than the groups in the interdependent self-construal condition. As predicted, the introduction of the interaction term in the second step produced a significant increase in explained variance, $R^2 = .11$, $F(3, 31) = 4.48$, b = -.34, $p = .011$.

In order to explore the nature of this interaction, we conducted separate simple slope regression analyses within the independent and interdependent conditions, and within the low-specialization and high-specialization groups. The specialization component of

transactive memory was found to have an effect on group performance only in the independent self-construal condition, $R^2 = .37$, F (1, 16) = 8.62, b = -.60, p = .01 (see Table 2). Transactive memory did not predict assembly errors in the interdependent self-construal condition, b = -.22, *ns.* Again, we did not obtain a significant effect of self-construal activation for low-specialization groups (b = .69, p = .084) or for high-specialization groups (b = -.22, p = .675).

We did not obtain any significant results for the other dimensions of integrated transactive memory (coordination and credibility self-reported measures).

Discussion

The objective of the present study was to examine whether the well-established relationship between transactive memory and group performance is moderated by the activation of independent or interdependent self-construal. Because transactive memory systems have been found to have beneficial effects on group performance (e.g., Hollingshead, 1998a; Liang et al., 1995), and because individuals with independent self-construal are more likely to differentiate themselves from others and stress their individuality (e.g., Bechtoldt et al., 2012; Cross et al., 2011; Oyserman et al., 2002), we expected differentiated transactive memory structures (i.e., specialization) to have stronger positive effects on group performance in groups in which independent self-construal had been primed. In contrast, we expected integrated transactive memory structures (i.e., coordination and credibility) to have stronger positive effects on group performance in groups in which interdependent self-construal had been activated.

Our study partially confirmed these predictions, as we found a negative relationship between the number of errors and the specialization component of transactive memory in the independent self-construal condition. This result indicates that independent self-construal priming can affect the relationship between transactive memory, particularly task specialization, and group performance. It may be that the activation of independent self-construal led team

members to focus on specific skills and role differentiation during the assembly task. We obtained similar results from the video-coded real-time behaviors and the self-reported measures of transactive memory. These findings indicate that self-construal is a cognitive state that can be induced by a short priming procedure and that this self-construal priming influences team-level outcomes such as transactive memory. This result is interesting in terms of the constitution and management of cross-cultural teams, as it confirms the need to explore the ways in which team composition affects motivations for sharing information, which may in turn affect the classical positive effect of transactive memory on collective performance (Ren & Argote, 2011).

Contrary to our prediction, our self-construal priming procedure did not have a significant impact on integrated transactive memory structures (i.e., coordination and credibility components). The effects of the coordination and credibility dimensions on group performance were no stronger in the groups in which interdependent self-construal was activated than they were in the groups in which independent self-construal was activated. We believe the failure to reveal such an impact was mostly due to the nature of the robot assembly task used in our experiment, which required participants to focus on role differentiation and specialization behaviors, rather than on coordination and credibility behaviors. Hence, the next step in our research program will be to find a task involving coordination and credibility behaviors in order to determine whether interdependent self-construal priming has an effect on transactive memory and group performance with this type of task.

Strengths and limitations

Our study's primary strength is that the results provide empirical evidence that group performance can be moderated by self-construal priming in a collaborative social context. Further investigations of this impact could provide significant contributions to the field of transactive memory research. In addition, our study is the first to examine the impact of self-construal on the performance of small groups with real interactions (see Goncalo & Staw, 2006; Utz, 2004). As such, it provides empirical evidence

for the influence of different types of self-construal on real work-group interactions and on the occurrence of errors.

However, our study also has a number of limitations. First, our sample was small and consisted of undergraduate students working in ad-hoc groups for a short period of time. Although there is a growing tendency for organizations to form teams that work together for short periods, the characteristics of our sample and task restrict the external validity of the results. Further studies are needed to extend these laboratory findings to actual employees working in teams. Second, our study focused on one individual-level factor (self-construal) and its impact on team outcomes, even though other factors linked to team composition, most notably the proportions of Independent and Interdependent individuals in the group, may also influence expertise recognition and, therefore, the development of transactive memory systems (LePine, 2003). Third, our experimental design did not include a control condition, and it could be argued that independent self-construal is activated chronically in individualistic countries such as France (Gardner, Gabriel, & Lee, 1999, for individuals in America). Nevertheless, our manipulation check showed that activating independent versus interdependent self-construal did have an effect. Fourth, the moderating effect of independent self-construal on transactive memory processes and performance could be specific to the nature of the task we chose for our study. Indeed, interdependent self-construal is likely to be less relevant than independent self-construal in the case of team tasks that require little interdependence, or that have relatively simple social or technical demands (Driskell, Salas, & Hughes, 2010; Gupta & Hollinshead, 2010). However, for highly interdependent team tasks (e.g., teams in the aviation, military, and medical fields), interdependent self-construal may be of greater importance for team outcomes. Hence, the moderating effect of self-construal may depend on team composition, team heterogeneity, and team interdependence. The next step in this research program will be to examine the effects of self-construal activation on group performance on different tasks.

Conclusion

Our study represents an initial step in examining the effects of independent versus interdependent self-construal on transactive memory in real work-group interactions. Our results suggest that priming independent versus interdependent aspects of self-construal can have an effect on the classic transactive memory-group performance relationship, which in turn affects team errors. In doing so, it addressed a topic at the interface of social, cognitive and industrial/organizational psychology, and therefore produced findings that may interest researchers in several fields. Our results also have implications in managerial contexts. Indeed, the independent vs. interdependent self-construal can easily be induced in work context during staff meetings by presenting financial incentives that are either given to team and thus equally distributed among group members or given to each employee. The study of the priming effects of individualism / collectivism in groups is therefore an important issue for work team performance. Finally, we hope that these findings will encourage further research into how the characteristics of group members impact group processes, such as transactive memory, and thereby affect group performance.

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