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Jessica Andrews-Todd
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Partner Characteristics and Social Contagion: Does Group Composition Matter?

JESSICA J. ANDREWS[1]* and DAVID N. RAPP[1,2]

[1]*School of Education & Social Policy, Northwestern University, USA*
[2]*Department of Psychology, Northwestern University, USA*

Summary: People's incorrect recalls can contaminate their collaborators' performance on subsequent tasks, referred to as the social contagion of memory. Research investigating how expectations about group members' abilities and affiliations relate to such contagion has given little attention to the mechanisms underlying any differential reliance on collaborators' contributions. In two experiments, we investigated whether expectations about a collaborative partner influence social contagion and whether source monitoring was related to any differential reliance. Contagion was reduced, for both accurate and inaccurate information, when participants worked with a partner perceived to be of low as compared with high credibility. Participants also showed reduced contagion after working with an out-group as compared with an in-group partner. These findings indicate that partner characteristics influence whether the information generated during a collaborative task is encoded and/or relied upon later. Expectations about potentially problematic sources can motivate resistance to misinformation through careful monitoring of partner contributions. Copyright © 2014 John Wiley & Sons, Ltd.

Research on memory often focuses on the individual, with an emphasis on what someone might remember after an experimental manipulation or naturally occurring event. But individuals also regularly engage in group activities, working together on tasks that involve the encoding and retrieval of information from memory. Study of these common collaborative experiences has highlighted the important role of social influences on memory, particularly with respect to the benefits and costs of working in groups (Barber, Rajaram, & Aron, 2010; Basden, Basden, & Henry, 2000; Congleton & Rajaram, 2011; Cuc, Koppel, & Hirst, 2007; Finlay, Hitch, & Meudell, 2000; Gabbert, Memon, & Wright, 2006; Roediger, Meade, & Bergman, 2001; Weldon & Bellinger, 1997). To date, this work has identified distinctions between the consequences of memory activity enacted at individual and group levels. In the current study, we investigated how particular characteristics of group members influence the products of collaborative remembering, testing the degree to which people rely on the information their collaborative partners provide. We also investigated factors that drive such effects by examining the cognitive processes and mechanisms that may cause differential reliance when partner characteristics are made salient.

In general, people seem to rely on the information provided by others, even if that information is incorrect and should be ignored or discounted. Specifically, when two people collaborate to recollect an event, information incorrectly remembered by one person can be integrated into their partner's memory, with the partner problematically recalling that incorrect information later. This effect is termed the social contagion of memory (Roediger et al., 2001) or memory conformity (Wright, Self, & Justice, 2000). In one demonstration of the effect, Roediger et al. had participants individually study pictures of household scenes (e.g., a desk) and, in a subsequent collaborative recall, asked pairs of participants to take turns recalling items from the scenes. Unbeknownst to participants, one member of each pair was a confederate who, during the collaborative recall, purposefully recalled items that had not appeared. Some of the false recalls included typical items for the scene contexts (e.g., a printer on a desk), while others were appropriate but less typical (e.g., a rolodex on a desk). On a later individual memory test, participants recalled a significant proportion of the false items the confederate had mentioned during the collaborative recall, despite those items never having appeared in the scenes. These effects were most apparent for mentioned items that were highly typical for the scenes. The collaborative recall instantiated false memories that participants later relied upon even though the information associated with those memories was not personally experienced.

These patterns can change as a function of the credibility of the source providing misinformation. While credible and neutral sources encourage the construction of false memories and concomitant decisions in line with sources' potentially misleading reports, people are less likely to recall misleading information provided by non-credible sources (e.g., Brown, Coman, & Hirst, 2009; French, Garry, & Mori, 2011; Hoffman, Granhag, See, & Loftus, 2001; Smith & Ellsworth, 1987; Underwood & Pezdek, 1998). Previous studies have investigated a variety of characteristics associated with the perceived credibility of a source, including source familiarity (French, Garry, & Mori, 2008; Hope, Ost, Gabbert, Healey, & Lenton, 2008), age (Ceci, Ross, & Toglia, 1987; Davis & Meade, 2013), power (Skagerberg & Wright, 2008; Vornik, Sharman, & Garry, 2003), confidence (Wright et al., 2000), perceived knowledge of stimuli (Allan, Midjord, Martin, & Gabbert, 2012; Gabbert, Memon, & Wright, 2007), and trustworthiness (Echterhoff, Hirst, & Hussy, 2005). For example, Dodd and Bradshaw (1980) presented participants with slides depicting a car accident, followed by an eyewitness account that potentially included false information. Participants were informed that the account had been provided either by a neutral bystander or by the driver who caused the accident and might seek to mislead readers. Participants were less accurate in their responses on a subsequent questionnaire about the depicted accident after receiving false information from a neutral source than when the source was potentially misleading or no false information had been provided in the account.

*Correspondence to: Jessica J. Andrews, School of Education & Social Policy, Northwestern University, 2120 Campus Drive, Evanston, IL 60208, USA.
E-mail: jessica.andrews@u.northwestern.edu

These credibility effects have been consistently demonstrated using different types of stimuli (e.g., photos, videos, and texts), methods of delivering misinformation (e.g., questionnaires, interviews, narratives, and face-to-face discussions), and memory assessments (e.g., free recall, cued recall, and recognition). But additional questions still remain. For example, what underlies the effects that emerge as a function of source credibility? Few studies to date have focused on the cognitive processes and mechanisms that may drive such effects. One possibility is that people might devote more careful attention to information provided by low as compared with high credibility or neutral sources. The reported effects might therefore be a function of more or less careful source monitoring, in line with previous work showing increases in memory distortions when monitoring fails or is ignored (e.g., Chambers & Zaragoza, 2001; Dodson & Johnson, 1993; Frost, Ingraham, & Wilson, 2002; Lane, 2006; Lindsay & Johnson, 1989; Lindsay, 1990; Meade & Roediger, 2002; Zaragoza & Lane, 1994). According to the source monitoring framework (Johnson, Hashtroudi, & Lindsay, 1993), activation of memory representations is accompanied by perceptual, spatial, semantic, and affective details that reflect conditions and contexts under which the memories were formed. People make attributions about the source of a memory based on an evaluation of these characteristics. For example, if a retrieved memory is associated with visual features, an individual may identify this memory as having been personally experienced. Source monitoring errors emerge precisely when a memory experience from one source is misattributed to another source. In line with this framework, individuals might be more likely to misattribute information from a credible source as aligning with their own experiences when the information involves familiar details or, conversely, distinguish the characteristics of personally experienced memories when they contrast starkly with memories linked to non-credible sources.

These possibilities have been highlighted in work assessing whether warnings about credibility encourage resistance to misinformation through the careful monitoring of memory characteristics. Across several experiments, Echterhoff et al. (2005) asked participants to view a video of a criminal event or an accident, then read a narrative containing misleading details about the witnessed event, and finally complete a memory test. Similar to the Dodd and Bradshaw (1980) work, participants who, after reading the narrative, were warned that the source was untrustworthy or incompetent, or were explicitly told to monitor for discrepancies, were less likely to reproduce misinformation than were participants who were told the source was credible or who had received no instructions. Participants warned about the source also exhibited superior performance on a questionnaire designed to evaluate qualitative features of their memories. These results support the view that awareness that a source is of low credibility leads to more careful encoding and monitoring of the contents of memory, protecting against memory errors.

While the previously described work is certainly consistent with the notion that individuals might more carefully distinguish information as a function of source, participants' source memory was not directly tested. In one notable study directly testing source memory, Davis and Meade (2013) investigated age as a source characteristic. Young and older adult participants studied household scenes and then completed a collaborative recall with a young or older adult confederate. On an individual recall, both participant groups were more likely to discount the false suggestions of older adult confederates than those of young adult confederates; however, a source monitoring test revealed no differences in source recognition as a function of the source's age. Consequently, the notion that participants who receive information from low as compared with high credibility sources more carefully consider memory characteristics has not been supported with the use of source monitoring measures (but see Chambers & Zaragoza, 2001, for evidence following explicit warnings). In the current project, we sought to provide an additional test of this idea by examining how monitoring of source information from a partner of high or low credibility might contribute to an individual's reliance on a partner's productions.

The phenomenology of memories is an integral part of the source monitoring framework, as memories for perceived events are often accompanied by greater perceptual, contextual, and affective information than are imagined or internally generated memories (Johnson et al., 1993; Mitchell & Johnson, 2000). One's phenomenological experiences of memories (particularly for false memories) can therefore provide insight into reliance on information from different sources. These contributions can be assessed by asking participants to provide remember and know judgments for the items they recall. Using this procedure, items are identified as remembered when participants have a conscious recollection of previously encountering the information; items are identified as known when participants believe they previously encountered the information but have no conscious recollection of the items or experiences associated with them (Gardiner, 1988; Rajaram, 1993; Tulving, 1985). So, for example, if information from a low credibility collaborator induces more careful evaluation of source information, we might expect participants to behave more conservatively in reporting they *remember* falsely suggested items from such low as compared with high credibility sources (Mather, Henkel, & Johnson, 1997). These kinds of profiles should prove informative in determining whether reliance on a partner's contributions is related to source monitoring.

In Experiment 1, source credibility was manipulated with respect to two critical partner characteristics: competence and confidence (Berlo, Lemert, & Mertz, 1969; Cramer, Brodsky, & DeCoster, 2009; Leippe, Manion, & Romanczyk, 1992; Whitehead, 1968). Competence involves expectations about whether a source possesses accurate knowledge (Hovland, Janis, & Kelley, 1953). Individuals are less likely to encode information provided by an incompetent as compared with a competent source (Echterhoff et al., 2005; Kwong See, Hoffman, & Wood, 2001; Smith & Ellsworth, 1987; Underwood & Pezdek, 1998). Confidence is associated with similar effects, as people conform more to individuals who are confident about their memories (Goodwin, Kukucka, & Hawks, 2013; Wright et al., 2000). Examinations of these effects usually provide participants with explicit statements regarding source credibility rather than allowing participants to establish those expectations through *both* explicit information and the kinds of face-to-face collaborative interactions for which performance might necessitate considerations of credibility (but see Ceci, et al., 1987, and Skagerberg & Wright, 2008). An emerging awareness of partner abilities is common in group interactions, with people generating inferences and expectations about others based on observations of their behavior and interpersonal exchanges. Participants were informed about the credibility of a confederate partner and also observed their partner's performance, which offered insight into competence and confidence. The resulting likelihood of exhibiting social contagion was thus examined as a function of partner credibility.

In Experiment 2, we tested the effects of source credibility using an additional social characteristic that is less explicitly associated with credibility, as participants collaborated with a confederate presented as a member of their in-group or out-group. Unlike in Experiment 1, participants were not told about or offered behavioral evidence useful for generating inferences concerning credibility. Previous research has shown that people use group membership to make credibility judgments (Horry, Palmer, Sexton, & Brewer, 2012), often perceiving individuals from their in-group as more credible than individuals from an out-group (Clark & Maass, 1988; Doosje, Branscombe, Spears, & Manstead, 2006; Neuliep, Hintz, & McCroskey, 2005). Also, people generally evaluate groups to which they belong more favorably than groups to which they do not (Ashburn-Nardo, Knowles, & Monteith, 2003; Howard & Rothbart, 1980; Maass, Ceccarelli, & Rudin, 1996; Perdue, Dovidio, Gurtman, & Tyler, 1990; Tajfel, Billig, Bundy, & Flament, 1971). This manipulation offered a second opportunity to examine whether social contagion was influenced by the availability of characteristics relevant for source attributions.

For both experiments, we predicted that participants would, on a final individual memory test, recall fewer erroneous items and provide fewer remember judgments for the erroneous items offered by a partner with low rather than high credibility and by a partner from an out-group rather than an in-group. We also predicted that these reductions would be accompanied by greater accuracy in source monitoring for erroneous items offered by the low as compared with the high credibility source. This pattern would suggest that any resistance to misinformation provided by a low credibility source may be the result of careful monitoring of information provided by that source. These predictions rely on the notion that individuals should avoid *incorrect* information provided by their partners. Importantly, social contagion can also be beneficial when individuals rely on *accurate* partner information. Thus, we predicted an additional consequence of credibility as a source cue: Participants should recall fewer *correct* items provided by a partner with low rather than high credibility and provided by an out-group than an in-group partner. This aligns with demonstrations that warnings about inaccuracies can encourage the rejection of true *and* false items provided by a source (Echterhoff, Groll, & Hirst, 2007).

We note that these predictions are not in any way guaranteed. A growing body of work suggests that social contagion may emerge regardless of collaborator characteristics. For example, participants recall false information even when sources might be called into question (e.g., Hinze, Slaten, Horton, Jenkins, & Rapp, 2014; Marsh, Meade, & Roediger, 2003). Warnings and instructions often prove unsuccessful at encouraging readers to discount the inaccuracies provided by sources (Marsh & Fazio, 2006). People have even been shown to rely on the information provided by low credibility sources despite instructions, reminders, and delays intended to draw attention to source features (Sparks & Rapp, 2011). Concerns about credibility do not emerge spontaneously, nor are they acted upon, unless participants are motivated and prepared to engage in source evaluation (Chaiken, Liberman, & Eagly, 1989; Petty & Cacioppo, 1986). Based on these findings, we might predict little to no effect of knowledge about partner credibility or group membership on recall or source monitoring, instead observing general effects of social contagion. This contrasts with our earlier predictions focused on the role of social expectations with respect to collaborative interactions.

EXPERIMENT 1

We first examined whether expectations about a partner's credibility would influence the likelihood of social contagion. Participants studied categorized word lists and then completed a collaborative recall of the lists with a confederate partner who exhibited characteristics of high credibility, low credibility, or offered no credibility information. Participants' memory for the word lists was assessed with an individual cued-recall test, and source monitoring was assessed with a recognition source-monitoring test. We hypothesized that if knowledge about credibility influences collaborative activity, participants' recalls would differentially reveal reliance on the information provided by high versus low credibility partners, and increased reliance would be accompanied by greater source misattributions. However, if participants do not account for partner credibility during the activity, we predicted their recalls and source monitoring would similarly exhibit social contagion across partner types.

Method

Participants and design

Forty-eight undergraduates from Northwestern University completed the experiment for $12 payment. Data from three participants were discarded for failure to follow directions. The experiment utilized a $2 \times 2 \times 3$ mixed design. Exposure to social contagion (contagion or no contagion) and the expectancy of the contagion words in the list contexts (high-expectancy or low-expectancy) were manipulated within subjects, in line with Roediger et al. (2001). Source credibility of the confederate partner (high credibility, low credibility, or uninformed) was manipulated between subjects, with 15 participants randomly assigned to each condition. The confederate was a female researcher familiar with the goals of the project. The dependent variables included participants' recalls of the items produced by the confederate and recognition of the source of any potential erroneous recalls (which we refer to as contagion items).

Materials

The study items were six categorized word lists on the topics of birds, human body parts, vegetables, four-footed animals, articles of clothing, and flowers (Meade & Roediger, 2006; adapted from category norms provided by Battig & Montague, 1969). Two items were added to each list, leaving a total of 24 items for each of the six lists. The items were ordered according to the frequency with which they were given as an example of a category. The first and last two items from each list (i.e., items 1, 2 and items 23, 24) were excluded and used as contagion items by the confederate during the collaborative recall, leaving 20 items from each list for presentation. Items 1 and 2 were used as high-expectancy contagion items (i.e., items typical of list contexts): Item 1 was suggested to participants, but if a participant spontaneously named that item before the confederate did during the collaborative recall, item 2 was used by the confederate instead. Items 23 and 24 were low-expectancy contagion items (i.e., items less typical of list contexts), with item 24 serving as a potential alternate for item 23. (Across the experiment, alternate contagion items were only used four times by the confederate.) A 36-item paper and pencil recognition source-monitoring test (Meade & Roediger, 2002) included 18 list items (three items from each studied list), 12 contagion items (one high-expectancy and one low-expectancy contagion item from each list, half mentioned by the confederate), and six unrelated, non-presented items. The materials also included a one-page passage designed to instantiate expectations about partner credibility, a filler worksheet of multiplication problems, individual recall sheets for each of the six studied lists, and a manipulation check questionnaire.

Procedure

Each participant worked separately with the confederate partner and was told that the purpose of the study was to examine how people process information together. Participants were introduced to their partner (who was presented as a naïve participant) and given a one-page passage with the instructions to circle as many instances of the letter F as they could find in 1 minute. In the high credibility condition, the confederate completed the task circling 24 instances of the letter F, and in the low credibility condition, the confederate circled only five instances of the letter F. (On average, participants circled 13 instances of the letter F.) This manipulation was intended to provide evidence of the confederate's competence. The participant and confederate then exchanged papers, counting the number of instances of the letter F that the other had circled and recording that number on the sheet. After completing the assessment, the experimenter publicly informed the participant and confederate what this recorded number revealed about their cognitive processing ability (i.e., competence). Participants were always told they demonstrated average ability, whereas the confederate's performance demonstrated either high or low ability depending on the assigned condition. In the uninformed condition, participants completed the task but moved on without scoring their passages or receiving feedback from the experimenter.

Next, the experimenter introduced the memory task, completed with the participant and confederate in the same room, seated at separate desks with a divider blocking their view of each other. (The confederate also seemingly completed the tasks described here.) Participants viewed six categorized word lists on a computer screen, with items within the lists and list categories presented in the same order for each participant. Each word in a list was presented for 1.5 seconds, and after a list was finished, participants pressed the 'P' key to start the next list. Participants were asked to pay close attention to prepare for a memory test. A 4-minute filler task was presented after the study phase to discourage rehearsal strategies.

Each participant next completed a collaborative recall with the confederate, moving from the desks to sit facing each other near the experimenter. The recall began with the experimenter naming a list category, and the participant and confederate taking turns recalling items until each had recalled six items from the list. This was completed in the order the lists were studied, with the experimenter recording recalls on paper. The confederate's recalls were delivered from a memorized script including items that appeared (correct items) and did not appear (contagion items) in the lists. There were two forms of the script to counterbalance whether the confederate's recalls included or omitted contagion items from each list—that is, three of the six lists recalled by the confederate always included contagion items (contagion condition) and three did not (control condition). For each list that included contagion items, the confederate recalled one high-expectancy and one low-expectancy contagion item as the fourth and sixth recall, also counterbalanced in two forms to equate exposure to contagion items as a function of expectancy in the list positions across the experiment. During recall, the confederate behaved in a manner that provided information about her confidence: In the low credibility condition, the confederate included hesitations and inflections in her voice to demonstrate uncertainty during recall, while in the high credibility condition, the confederate recalled items at a regular pace with confident tones. In the uninformed condition, the confederate recalled items at a pace that matched the participant to avoid offering insight into her confidence.

Next, each participant returned to the divided desks to complete an individual recall. Participants received a blank sheet of paper with the name of a list across the top, with 2 minutes to recall as much they could remember from the list without guessing. Participants were also asked to make a remember/know judgment beside each recalled item. They were asked to write 'R' if they had a conscious recollection of studying the item in the list, or 'K' if they had no such recollection but still believed the item was present in the list (Tulving, 1985). A new sheet of paper was provided every 2 minutes until each list had been recalled in the order it was studied.

After completing the individual recall, participants were given the 36-item recognition source-monitoring test. This test presented a list of words, with participants asked to identify the source of each word by marking the source name (list only, partner only, both sources, or neither) with a check. Half of the words on the list appeared in the studied lists, and half were lures. Twelve of the 18 lures, split evenly, were high-expectancy and low-expectancy contagion items;

six were falsely recalled by the confederate during the collaborative recall (contagion items), and six fit list categories but had not been recalled by the confederate (control items). The remaining six lures were unrelated items that had not appeared in the studied lists. Participants were instructed to indicate 'list only' if they remembered seeing the word in a studied list, 'partner only' if the word was recalled by the confederate but had not appeared in any of the lists, 'both sources' if the word had appeared in one of the lists and was recalled by the confederate, and 'neither' if the word did not appear in any of the studied lists and had not been recalled by the confederate.

Finally, participants completed a three-question manipulation check to ensure beliefs about the confederate aligned with their assigned conditions. The first question stated, 'How would you characterize your partner's cognitive processing ability?'; the second stated, 'How would you describe your partner based on his/her performance in the study?'; and the third stated, 'How accurate was the memory of your partner?' For each question, participants circled a number on a Likert scale ranging from 1 to 7, with 1 representing *very poor*, *very incompetent*, and *very inaccurate*, and 7 representing *very good*, *very competent*, and *very accurate* for the respective questions. Participants were then debriefed and compensated for completing the study.

Results and discussion

The analyses reported below are based on participants' individual recall and recognition source-monitoring performance as a function of their collaborative recalls.

Manipulation check

Participants' expectations about their partner aligned with the intended credibility manipulation, with ratings for partner ability differing across groups, $F(2, 42) = 66.41$, $MS_e = 0.57$, $p < .001$, $\eta^2 = .76$. Tukey post-hoc comparisons showed participants rated their partner's ability higher in the high ($M = 6.57$) than low credibility condition ($M = 3.57$, $p < .001$, $d = 4.13$). Participants in the uninformed condition ($M = 5.93$) also rated their partner's ability higher than did participants in the low credibility condition ($p < .001$, $d = 2.91$). Ratings were marginally higher in the high credibility than uninformed condition ($p = .06$, $d = 0.89$). Ratings for competence obtained a similar pattern, $F(2, 42) = 46.40$, $MS_e = 0.68$, $p < .001$, $\eta^2 = .69$, with higher ratings in the high ($M = 6.33$) than low credibility condition ($M = 3.67$, $p < .001$, $d = 3.26$). Participants in the uninformed condition ($M = 6.00$) also rated their partner's competence higher than did participants in the low credibility condition ($p < .001$, $d = 2.66$). Partner ratings in the high credibility and uninformed conditions did not differ ($p = .52$, $d = 0.42$). Ratings of partner memory were similar, $F(2, 42) = 34.21$, $MS_e = 0.93$, $p < .001$, $\eta^2 = .62$, with participants providing higher ratings in the high ($M = 6.13$) than low credibility condition ($M = 3.43$, $p < .001$, $d = 2.60$). Participants in the uninformed condition ($M = 5.73$) rated their partner's memory as higher than did participants in the low credibility condition ($p < .001$, $d = 2.11$). Ratings again did not differ for the high credibility and uninformed conditions ($p = .50$, $d = 0.55$).

False recall

Results for false recall are displayed in Table 1. A 2 (contagion or control) × 2 (high-expectancy or low-expectancy) × 3 (high credibility, low credibility, or uninformed) repeated measures ANOVA revealed a main effect of contagion, $F(1, 42) = 33.06$, $MS_e = 0.04$, $p < .001$, $\eta_p^2 = .44$. Replicating the traditional social contagion effect, participants recalled more contagion items (high-expectancy and low-expectancy items suggested by the confederate) ($M = 0.36$) than control items (the same high-expectancy and low-expectancy items not suggested by the confederate) ($M = 0.19$). A main effect of expectancy was also obtained, $F(1, 42) = 71.68$, $MS_e = 0.06$, $p < .001$, $\eta_p^2 = .63$. Participants were more likely to falsely recall high-expectancy ($M = 0.43$) than low-expectancy items ($M = 0.12$), also replicating previously reported effects.

The main effect of group was significant, $F(2, 42) = 11.18$, $MS_e = 0.09$, $p < .001$, $\eta_p^2 = .35$. Tukey post-hoc comparisons indicated that participants who worked with the high credibility partner ($M = 0.38$) recalled more false items than did participants who worked with the low credibility partner ($M = 0.13$, $p < .001$, $d = 0.79$). Participants in the uninformed condition ($M = 0.31$) also recalled more false items than did participants who worked with the low credibility partner ($p = .006$, $d = 0.61$), performing similarly to participants who worked with the high credibility partner ($p = .40$, $d = 0.20$). Most critically for the current study, we observed a Contagion × Group interaction, $F(2, 42) = 15.44$, $MS_e = 0.04$, $p < .001$, $\eta_p^2 = .42$. Simple effects analyses revealed a significant group effect for the contagion condition in which false items were suggested by the confederate, $F(2, 42) = 22.34$, $MS_e = 0.03$, $p < .001$, $\eta_p^2 = .52$, but no group effect in the control condition in which the confederate did not provide false items, $F(2, 42) = 1.97$, $MS_e = 0.03$, $p = .15$, $\eta_p^2 = .08$. Participants who worked with a high credibility partner ($M = 0.50$) or were uninformed about their partner's credibility ($M = 0.47$) recalled a greater proportion of contagion items suggested by the confederate than did participants who worked with a low credibility partner ($M = 0.10$). Importantly, the three groups did not differ in their recall of those items when their partner never mentioned them. Additional simple effects analyses examining false recalls within each group revealed that social contagion (i.e., greater recall of false items suggested by a partner as compared with when those items were not suggested) did not emerge for participants who worked with a low credibility partner, $F(1, 42) = 1.28$, $MS_e = 0.02$, $p = .26$,

Table 1. Mean proportion of false recall of high-expectancy and low-expectancy items for high credibility, low credibility, and uninformed groups

Condition	High expect	Low expect	*M*
High credibility			
Contagion	0.71	0.29	0.50
Control	0.47	0.07	0.27
Low credibility			
Contagion	0.20	0.00	0.10
Control	0.24	0.07	0.16
Uninformed			
Contagion	0.67	0.27	0.47
Control	0.29	0.02	0.16

$\eta_p^2 = .03$. Notably, participants in the low credibility condition were more likely to spontaneously recall unmentioned contagion items ($M = 0.16$) than recall those items when they had been suggested by their partner ($M = 0.10$). The social contagion effect *did* emerge for participants in the high credibility, $F(1,\ 42) = 22.59$, $MS_e = 0.02$, $p < .001$, $\eta_p^2 = .35$, and uninformed conditions, $F(1, 42) = 40.16$, $MS_e = 0.02$, $p < .001$, $\eta_p^2 = .49$. No other interactions were significant, all ps > .05.

Remember/know judgments. Remember and know judgment data appear in Table 2. Using conditional probabilities, we conducted separate analyses for remember and know judgments, again with a 2 (contagion or control) × 2 (high-expectancy or low-expectancy) × 3 (high credibility, low credibility, or uninformed) repeated measures ANOVA.

Analyses of know judgments showed that for false items recalled, participants were equally likely to provide know judgments for contagion items ($M = 0.28$) and control items ($M = 0.23$), $F(1, 42) = 1.19$, $MS_e = 0.08$, $p = .28$, $\eta_p^2 = .03$. Participants were more likely to provide know judgments for items recalled if they were high-expectancy ($M = 0.42$) as opposed to low-expectancy items ($M = 0.09$), $F(1, 42) = 36.84$, $MS_e = 0.13$, $p < .001$, $\eta_p^2 = .47$. There was also a main effect of group, $F(2,\ 42) = 6.85$, $MS_e = 0.10$, $p = .003$, $\eta_p^2 = .25$. Tukey post-hoc comparisons showed that for the false items recalled, participants in the high credibility condition ($M = 0.29$) were more likely to provide know judgments than were participants in the low credibility condition ($M = 0.14$, $p = .02$, $d = 0.43$). Participants in the uninformed condition ($M = 0.34$) were also more likely to provide know judgments for recalled false items than were participants in the low credibility condition ($p = .003$, $d = 0.57$). Know judgments for the falsely recalled items among participants in the high credibility and uninformed conditions did not differ ($p = .74$, $d = 0.13$). The Contagion × Group interaction was not significant, $F(2, 42) = 1.30$, $MS_e = 0.08$, $p = .28$, $\eta_p^2 = .06$.

For remember judgments, for false items that were recalled, participants were just as likely to provide remember judgments for contagion ($M = 0.11$) and control items ($M = 0.09$), $F(1,\ 42) = 0.67$, $MS_e = 0.03$, $p = .42$, $\eta_p^2 = .02$. There was a main effect of expectancy, $F(1,\ 42) = 14.37$, $MS_e = 0.06$, $p < .001$, $\eta_p^2 = .26$, with participants more likely to report remembering falsely recalled items that were high-expectancy ($M = 0.17$) as compared with low-expectancy ($M = 0.03$). The main of effect of group was not significant, but there was a Contagion × Group interaction $F(2, 42) = 3.89$, $MS_e = 0.03$, $p = .03$, $\eta_p^2 = .16$. Specifically, relative to participants in the low credibility condition, participants in the high credibility and uninformed conditions were more likely to provide remember judgments for recalled contagion items, $F(2,\ 42) = 4.23$, $MS_e = 0.02$, $p = .02$, $\eta_p^2 = .17$, with no group differences observed for control items, $F(2,\ 42) = 1.19$, $MS_e = 0.03$, $p = .32$, $\eta_p^2 = .05$.

Correct recall

A one-way ANOVA revealed no differences between the three credibility conditions for recall accuracy, $F(2,\ 42) = 1.07$, $MS_e = 0.01$, $p = .35$, $\eta^2 = .05$. Across the lists, participants who worked with a high credibility partner recalled a mean proportion of 0.47 items, 0.42 items with a low credibility partner, and 0.45 in the uninformed condition. We also examined whether *accurate* information suggested by the partner was recalled by participants. A one-way ANOVA revealed differences in this type of helpful contagion, $F(2,\ 42) = 3.31$, $MS_e = 0.02$, $p = .05$, $\eta^2 = .14$. Tukey post-hoc comparisons showed that participants were more likely to recall accurate items suggested by a high ($M = 0.61$) than a low credibility partner ($M = 0.49$, $p = .05$, $d = 0.81$). Comparisons between the uninformed condition ($M = 0.59$) and high and low credibility conditions were not significant ($p = .92$, $d = 0.16$ and $p = .12$, $d = 0.77$, respectively).

Source monitoring

Data for the recognition source-monitoring test appear in Table 3. Correct sourcing responses for contagion items were ‘partner only’, as they were produced by the partner but never appeared in a list; correct responses for control items were ‘neither’, given that the information was never produced or shown at all. Source misattributions were operationalized, as the proportion of contagion and control items attributed to the studied lists (i.e., marking ‘list only’ or ‘both sources’). A 2 (contagion or control) × 3 (high credibility, low credibility, or uninformed) ANOVA revealed no main effect of contagion, $F(1, 42) = 2.67$, $MS_e = 0.02$, $p = .11$, $\eta_p^2 = .06$, but a main effect of group, $F(2, 42) = 6.21$, $MS_e = 0.11$, $p = .004$, $\eta_p^2 = .23$. Tukey post-hoc comparisons indicated that participants working with a high credibility partner ($M = 0.64$) showed more source misattribution errors than did participants

Table 2. Mean proportion of remember and know judgments for falsely recalled high-expectancy and low-expectancy items

	High credibility		Low credibility		Uninformed		
Judgment type	High expect	Low expect	High expect	Low expect	High expect	Low expect	M
Contagion							
Remember	0.27	0.12	0.08	0.00	0.14	0.04	0.11
Know	0.48	0.13	0.26	0.00	0.58	0.23	0.28
Control							
Remember	0.23	0.00	0.21	0.02	0.07	0.00	0.09
Know	0.50	0.07	0.21	0.09	0.50	0.03	0.23
Difference							
Remember	0.04	0.12	−0.13	−0.02	0.07	0.04	0.02
Know	−0.02	0.06	0.05	−0.09	0.08	0.20	0.05

Table 3. Mean proportion of source judgments for contagion and control items for high credibility, low credibility, and uninformed groups

	Contagion items				Control items			
	High	Low	Uninfo	*M*	High	Low	Uninfo	*M*
List only	0.21	0.16	0.18	0.18	0.51	0.38	0.52	0.47
Both list and partner	0.48	0.26	0.56	0.43	0.07	0.04	0.16	0.09
Total false recognition	0.69	0.41	0.73	0.61	0.58	0.42	0.68	0.56
Partner only	0.14	0.54	0.20	0.29	0.00	0.00	0.00	0.00
Neither list nor partner	0.17	0.05	0.11	0.11	0.45	0.58	0.32	0.45

Note: High, high credibility; Low, low credibility; Uninfo, uninformed.

working with a low credibility partner ($M = 0.42$, $p = .04$, $d = 0.82$). Additionally, participants uninformed about their partner's credibility ($M = 0.71$) made more source misattribution errors than did participants who worked with a low credibility partner ($p = .004$, $d = 1.07$), performing similarly to participants in the high credibility condition ($p = .71$, $d = 0.30$).

Group differences in the tendency to attribute suggested items to both the partner and the studied list emerged, $F(2, 42) = 7.53$, $MS_e = 0.05$, $p = .002$, $\eta^2 = .27$. Specifically, relative to participants in the low credibility condition ($M = 0.26$), participants in the high credibility ($M = 0.48$, $p = .02$, $d = 0.93$) and uninformed ($M = 0.56$, $p = .002$, $d = 1.46$) conditions were more likely to report that contagion items were not only mentioned by their partner but also appeared in the studied lists. There were no differences in these reports among participants in the high credibility and uninformed conditions ($p = .59$, $d = 0.36$). An examination of source monitoring accuracy for contagion items (i.e., attributing falsely suggested items to only the partner) revealed differences among the three credibility conditions, $F(2, 42) = 13.89$, $MS_e = 0.05$, $p < .001$, $\eta^2 = .40$. Tukey post-hoc comparisons showed that participants in the low credibility condition ($M = 0.54$) were more accurate in their source judgments for falsely suggested items than were participants in the high credibility ($M = 0.14$, $p < .001$, $d = 1.78$) and uninformed conditions ($M = 0.20$, $p < .001$, $d = 1.33$). Source monitoring accuracy for contagion items did not differ for participants in the high credibility and uninformed conditions ($p = .77$, $d = 0.31$). A one-way ANOVA obtained no differences among the three conditions for list item source accuracy, $F(2, 42) = 0.62$, $MS_e = 0.02$, $p = .55$, $\eta^2 = .03$: Participants showed correct source judgments for a mean proportion of 0.65 list items if they worked with a high credibility partner, 0.70 items with a low credibility partner, and 0.67 items when uninformed about their partner's credibility.

Summary

In line with previous findings, participants demonstrated social contagion effects and exhibited greater contagion with high-expectancy compared with low-expectancy contagion items. Importantly, partner credibility moderated these effects. Relative to participants in the high credibility and uninformed conditions, participants who worked with a low credibility partner were less likely to recall, provide remember judgments, and provide inaccurate source judgments for erroneous items provided by their partner. Contagion also led to benefits for participants who worked with the high credibility partner, as they often relied on the *accurate* information she provided during the collaborative recall.

These results indicate that expectations about credibility based on experiences with a partner can influence social contagion and that this influence may be driven by more careful monitoring (as exemplified by remember judgments and source monitoring performance) for information provided by a low credibility partner. Given the contrast for these findings with respect to more general consequences of social contagion, we conducted a second test using a different characteristic known to influence people's interactions with others. In Experiment 2, participants completed the collaborative task with a member of their in-group or out-group. The collaborative partner was now virtual rather than real, as previous work has shown effects of social contagion with even virtual partners. These modifications provided the means for attempting a complementary replication and necessary test of the generalizability of the previous effects.

EXPERIMENT 2

Method

Participants and design

Forty-seven Northwestern University undergraduates participated for \$6 payment. The experiment was a 2 × 2 × 2 mixed design with exposure to social contagion (contagion or no contagion) and expectancy (high-expectancy or low-expectancy) manipulated within subjects. Group membership (in-group or out-group) was manipulated between subjects. We removed seven participants from the analyses based on responses to the manipulation check. Of the 40 remaining participants, 20 were randomly assigned to work with an in-group partner and 20 with an out-group partner. The dependent variables were the same as in Experiment 1.

Materials

The word lists and materials were identical to Experiment 1 with the following additions. We created index cards containing the handwritten recalls of an unseen partner and adapted pictures of 10 paintings (from Google Images) to establish group membership in a minimal group manipulation (modeled after Ashburn-Nardo, Voils, & Monteith, 2001).

Procedure

The procedure from Experiment 1 was modified to include a group membership manipulation rather than a competence manipulation, and a collaborative recall procedure that involved, unbeknownst to the participants, a hypothetical, unseen partner. Each participant worked individually and was informed the purpose of the experiment was to determine the relationship between perceptual processing and artistic preference. To begin, participants each viewed five pairs of paintings presented on a computer screen, one pair at a time. They were asked to determine which of the two paintings in each pair they preferred, with the knowledge that two artists (named Xanthie and Quan) had painted them, but no knowledge as to which artist was responsible for which painting. After making their five judgments, each participant was informed of their artist preference. In actuality, this information was not based on judgments but on the condition to which the participant was randomly assigned. Assigned preference for a particular artist was used to establish group membership for the recall portion of the experiment.

The experimenter informed participants a second time which artist they preferred and then described what this preference revealed about their perceptual processing style. All participants were (falsely) informed that prior research has shown individuals who favor their preferred artist process perceptual information in a bottom–up manner. Participants were also (falsely) informed that individuals who favored the other artist process perceptual information in a top–down manner. We counterbalanced whether participants were told they preferred work by Xanthie or Quan, but all participants were identified as members of the bottom–up processing group. This information was intended to establish membership in an artist group associated with a particular processing style and to emphasize the difference between that group and an opposing group (Ashburn-Nardo et al., 2001).

After group assignment, and as in Experiment 1, participants completed a study phase, filler task, collaborative recall, individual recall, and recognition source-monitoring test. They were informed they would complete a collaborative recall with a partner who preferred the same artist or the other artist. Participants were told that their partner had completed the experiment previously and written their recalls for each word list on index cards (Meade & Roediger, 2002). In actuality, the recalls were prepared earlier as part of the experimental conditions. During the collaborative recall, the experimenter verbally named the list to be recalled in the same order as during study and handed participants a stack of their hypothetical partner's index cards corresponding with that list. The participant began by recalling an item that had appeared in the list and then turning over a card to read the item their partner had recalled on that card. For each list, this continued in six turns, with participants naming an item and then reading their partner's item from a card. The experimenter recorded each item the participant recalled. As in Experiment 1, for three of the six lists, the partner's recalls presented two contagion items, one high-expectancy and one low-expectancy.[1]

At the conclusion of the experiment, each participant completed three manipulation check items to evaluate the minimal group procedure. The first stated, 'I believe that I preferred the paintings by', the second stated, 'I noticed distinct differences in the styles of the paintings I viewed', and the third stated, 'My perceptual style can best be characterized as'. Participants circled a number from 1 to 7, with 1 representing *Quan*, *strongly disagree*, and *top–down*, and 7 representing *Xanthie*, *strongly agree*, and *bottom–up* for the respective questions (Ashburn-Nardo et al., 2001). Participants were then debriefed and compensated for completing the study.

[1] Because participants could have produced a word that appeared on a card subsequently offered by their partner, we felt it important to count the number of such instances to determine whether they might be a consideration for the comparisons. Participants only did this 22 out of 240 possible times (12 times in the in-group condition and 10 times in the out-group condition), and at similar rates between the critical group conditions, making it an unlikely influence for the differential effects. We additionally reran our analyses after removing these items, and the effects were largely the same.

Results and discussion

Manipulation check

Five participants indicated that they preferred the artist they had *not* been assigned, and two participants indicated a preference for neither artist, so data from these seven participants were excluded from the analyses (as in Ashburn-Nardo et al., 2001). All other participant ratings corresponded with the assigned conditions. Participants assigned to the Quan group reported a preference for Quan ($M = 1.85$), with their ratings below the midpoint on the Likert scale (i.e., 4), $t(19) = 12.90$, $p < .001$, $d = 2.87$. Participants assigned to the Xanthie group reported preferring Xanthie ($M = 6.10$), with their ratings above the midpoint on the scale, $t(19) = 14.66$, $p < .001$, $d = 3.28$. Differences were also observed in preference ratings between participants assigned to the Quan and Xanthie groups, $t(19) = 17.76$, $p < .001$, $d = 3.97$. Participants also reported noticing differences in the paintings ($M = 4.95$), which fell above the midpoint, $t(39) = 5.31$, $p < .001$, $d = 0.84$. Lastly, participant ratings corresponded with the bottom–up processing style they were assigned ($M = 5.80$), above the scale midpoint, $t(39) = 10.44$, $p < .001$, $d = 1.65$.

False recall

The results for false recall are displayed in Table 4. A 2 (contagion or control) × 2 (high-expectancy or low-expectancy) × 2 (in-group or out-group) repeated measures ANOVA revealed a main effect of contagion, $F(1, 38) = 32.76$, $MS_e = 0.05$, $p < .001$, $\eta_p^2 = .46$. Participants overall recalled more contagion items ($M = 0.38$) than control items ($M = 0.18$). There was also a main effect of expectancy, $F(1, 38) = 54.49$, $MS_e = 0.07$, $p < .001$, $\eta_p^2 = .59$, with participants more likely to falsely recall high-expectancy ($M = 0.43$) than low-expectancy ($M = 0.12$) items. The main effect of group was significant, $F(1, 38) = 5.47$, $MS_e = 0.09$, $p = .03$, $\eta_p^2 = .13$, with participants working with an in-group partner ($M = 0.33$) more likely to recall false items than were participants working with an out-group partner ($M = 0.22$).

Table 4. Mean proportion of false recall of high-expectancy and low-expectancy items for in-group and out-group participants

Condition	High expect	Low expect	*M*
In-group			
Contagion	0.60	0.30	0.45
Control	0.37	0.07	0.22
Out-group			
Contagion	0.50	0.12	0.31
Control	0.27	0.00	0.14

The Contagion × Group interaction was not significant, $F(1, 38) = 0.68$, $MS_e = 0.05$, $p = .41$, $\eta^2_p = .02$; however, follow-up simple effects analyses revealed a pattern similar to Experiment 1, with a significant group effect for the contagion condition, $F(1, 38) = 5.85$, $MS_e = 0.03$, $p = .02$, $\eta^2_p = .13$, but not the control condition, $F(1, 38) = 1.91$, $MS_e = 0.04$, $p = .18$, $\eta^2_p = .05$. Participants who worked with an in-group partner ($M = 0.45$) recalled a greater proportion of contagion items than did participants who worked with an out-group partner ($M = 0.31$). The two groups did not differ in their recall of those items when their partner never mentioned them.

Remember/know judgments. The data for remember and know judgments are displayed in Table 5. We conducted separate analyses for the judgments using conditional probabilities. For know judgments, participants were more likely to report knowing falsely recalled contagion ($M = 0.34$) than falsely recalled control items ($M = 0.23$), $F(1, 38) = 6.80$, $MS_e = 0.08$, $p = .01$, $\eta^2_p = .15$. Participants were also more likely to report knowing the falsely recalled high-expectancy ($M = 0.45$) than low-expectancy items ($M = 0.11$), $F(1, 38) = 32.07$, $MS_e = 0.15$, $p < .001$, $\eta^2_p = .46$. The main effect of group was not significant, $F(1, 38) = 1.71$, $MS_e = 0.12$, $p = .20$, $\eta^2_p = .04$. Participants in the in-group condition ($M = 0.32$) were as likely to report knowing falsely recalled items as were participants in the out-group condition ($M = 0.25$). There was no Contagion × Group interaction, $F(1, 38) = 3.10$, $MS_e = 0.08$, $p = .09$, $\eta^2_p = .08$.

Results for remember judgments showed that for false items recalled, participants were equally likely to provide remember judgments for contagion ($M = 0.12$) and control items ($M = 0.08$), $F(1, 38) = 1.68$, $MS_e = 0.04$, $p = .20$, $\eta^2_p = .04$.

Table 5. Mean proportion of remember and know judgments for falsely recalled high-expectancy and low-expectancy items

	In-group		Out-group		
Judgment type	High expect	Low expect	High expect	Low expect	M
Contagion					
Remember	0.23	0.05	0.19	0.00	0.12
Know	0.45	0.23	0.49	0.20	0.34
Control					
Remember	0.09	0.06	0.15	0.00	0.08
Know	0.58	0.03	0.30	0.00	0.23
Difference					
Remember	0.14	−0.01	0.04	0.00	0.04
Know	−0.13	0.20	0.19	0.20	0.12

Participants were more likely to provide remember judgments for falsely recalled high-expectancy ($M = 0.16$) than falsely recalled low-expectancy items ($M = 0.03$), $F(1, 38) = 9.03$, $MS_e = 0.08$, $p = .01$, $\eta^2_p = .19$. The main effect of group was not significant, $F(1, 38) = 0.21$, $MS_e = 0.09$, $p = .65$, $\eta^2_p = .01$, as participants in the in-group ($M = 0.11$) and out-group conditions ($M = 0.08$) were equally likely to report remembering recalled false items. The Contagion × Group interaction was not significant, $F(1, 38) = 0.49$, $MS_e = 0.04$, $p = .49$, $\eta^2_p = .01$.

Correct recall

No differences were observed between the groups for recall accuracy, $t(38) = 1.00$, $p = .32$, $d = 0.30$. Participants working with an in-group partner correctly recalled a mean proportion of 0.42 items, while participants working with an out-group partner correctly recalled a mean proportion of 0.45 items. Unlike Experiment 1, no differences emerged in the uptake of accurate information from the partner, $t(38) = 0.03$, $p = .98$, $d = 0.00$. Participants who worked with an in-group or an out-group partner both recalled a mean proportion of 0.60 of the suggested correct items.

Source monitoring

Table 6 displays participant performance on the recognition source-monitoring test. Unlike in Experiment 1, a 2 (contagion or control) × 2 (in-group or out-group) ANOVA confirmed a contagion effect, $F(1, 38) = 12.85$, $MS_e = 0.04$, $p = .001$, $\eta^2_p = .25$. Participants were more likely to exhibit source misattribution errors for contagion items suggested by the partner ($M = 0.66$) than when those items had not been suggested by the partner ($M = 0.49$). The main effect of group was not significant, $F(1, 38) = 1.13$, $MS_e = 0.10$, $p = .30$, $\eta^2_p = .03$. Participants who worked with an in-group partner made source misattributions for a mean proportion of 0.61 items, while participants who worked with an out-group partner made source misattributions for a mean proportion of 0.54 items.

Similar to Experiment 1, an examination of the nature of the source misattributions showed marginally significant group differences, $t(38) = 1.86$, $p = .07$, $d = 0.66$, with in-group participants ($M = 0.53$) showing a greater tendency to attribute contagion items to both their partner and the previously studied lists than did out-group participants ($M = 0.37$). However, source monitoring accuracy for contagion items did not differ between the two groups, $t(38) = 0.35$, $p = .73$, $d = 0.11$, with in-group participants ($M = 0.26$) and out-group participants ($M = 0.23$) revealing comparable accuracy for source judgments of contagion items. As in Experiment 1,

Table 6. Mean proportion of source judgments for contagion and control items for in-group and out-group participants

	Contagion items			Control items		
	In-group	Out-group	M	In-group	Out-group	M
List only	0.17	0.26	0.22	0.49	0.42	0.46
Both list and partner	0.53	0.37	0.45	0.04	0.03	0.04
Total false recognition	0.69	0.63	0.66	0.53	0.45	0.49
Partner only	0.26	0.23	0.25	0.03	0.01	0.02
Neither list nor partner	0.05	0.14	0.10	0.43	0.54	0.49

no significant differences in source monitoring accuracy for studied list items were obtained between the two groups, $t(38) = 0.55$, $p = .59$, $d = 0.15$. In-group participants showed correct source attributions for a mean proportion of 0.72 list items, while out-group participants showed correct source attributions for a mean proportion of 0.74 list items.

Summary

The results of Experiment 2 confirmed that expectations about a partner's group membership influence social contagion. Overall, participants who worked with an in-group partner falsely recalled more contagion items than did participants who worked with an out-group partner. Participants were also more likely to falsely recall high-expectancy as compared with low-expectancy contagion items, regardless of the group membership of the partner providing the items. Unlike in Experiment 1, the group effects did not carry over to performance on the source monitoring test, instead revealing a general contagion effect.

GENERAL DISCUSSION

Social contagion occurs when members of a group encode and rely upon the productions offered by their partners, even when those productions are incorrect. In the current project, we examined whether individuals, lacking prior familiarity, would generate expectations about their partners that influence the likelihood of social contagion, as well as factors that may drive any observed effects. In Experiment 1, participants completed a collaborative memory task with a co-present confederate partner who exhibited high credibility or low credibility, or provided little insight into her credibility. Overall, participants exhibited traditional patterns of social contagion, recalling contagion items when partners suggested them and recalling more high-expectancy than low-expectancy items. But participants who worked with a partner exhibiting low credibility were *less* likely to recall items suggested by their partner, as compared with participants who worked with a partner exhibiting high credibility or providing no credibility information. In Experiment 2, participants completed a similar task with a virtual partner identified as a member of their in-group or out-group. Participants exhibited social contagion, but this contagion was again moderated by partner characteristics. Specifically, participants working with an out-group as compared with an in-group partner were less likely to falsely recall items suggested by that partner.

Several informative conclusions can be drawn from these results. First, consistent with previous findings, group collaboration can influence an individual's subsequent recall, including beliefs about the acquisition of knowledge (Gabbert, Memon, & Allan, 2003; Meade & Roediger, 2002; Roediger et al., 2001). Participants' recalls included information provided by their partners, despite that information not having been personally experienced. Their remember judgments indicated that participants actually recollected some of the suggested items as having appeared in the studied lists. The findings thus replicate established contagion effects.

Second, the results highlight instances in which these effects can be differentiated based on beliefs about partners as derived from behaviors and descriptions. Individuals' knowledge about their partners influenced the likelihood that those partners' productions would contaminate memory. Interestingly, the results suggest that people may give their partners the benefit of the doubt: In Experiment 1, participants exhibited similar patterns of social contagion when working with credible partners and with partners of indeterminate credibility. This optimistic bias could emerge from greater attention to the task than to partner credibility given the challenge of the activity, a general bias concerning the perceived credibility of partners (and perhaps participants' beliefs about the credibility of fellow Northwestern students), or from the need for obtaining disconfirming evidence as to whether a partner will be suitable for a particular task (e.g., Echterhoff et al., 2005). Expectations about partner credibility and group membership influenced the likelihood of social contagion, indicating important boundary conditions that moderate the encoding of partner productions that have been consistently reported in the literature.

Third, the results indicate that social contagion can at times prove beneficial. In Experiment 1, participants encoded not only false information offered by their credible partner but also correct information from that same partner. This potential benefit did not emerge for participants who worked with the low credibility partner, as they instead rejected both the false and correct information she offered, in line with Echterhoff et al. (2007). Those authors reported that warnings about potential discrepancies between a witnessed event and a post-event narrative could lead to overcorrection such that participants might reject both the true and false information offered in the post-event narrative. In the current study, evidence for the partner's low credibility could have served as a warning for participants to monitor and reject her contributions because of the potential for inaccuracies. A rejection of both false and correct contributions from a low credibility partner can potentially lower overall recall accuracy. Rush and Clark (2013) demonstrated that when freely discussing previously studied information with a partner, participants can be exposed to more correct than incorrect suggestions. Thus, when rejecting contributions from a low credibility partner, an individual may actually reject more correct than incorrect items and thus fail to benefit from items that could boost overall recall. In addition, the beneficial effects of correct suggestions previously observed in Experiment 1 with high credibility partners also did not emerge in Experiment 2 when participants recalled information with a virtual partner from their in-group. Particular types of partner characteristics and interactions might prove differentially important for moderating social contagion. Two untested possibilities are whether face-to-face experiences are more likely than asynchronous interactions to support beneficial contagion and whether credibility offers a stronger cue for encouraging reliance on partner contributions than does membership in an arbitrary group.

In fact, we suspect that some of the discrepancies obtained between the two experiments might relate precisely to these factors. Recall that greater attenuation of social contagion was obtained in Experiment 1 (involving a face-to-face partner) than Experiment 2 (involving a partner who was not co-present). Information exerts a stronger influence when it is encoded during face-to-face social situations versus when it is encoded from non-interactive, textual sources (Gabbert, Memon, Allan, & Wright, 2004; Meade & Roediger, 2002; Paterson & Kemp, 2006). One possibility then is that social contagion was more likely to emerge from the conditions provided in Experiment 1 than Experiment 2. But additionally, the potential utility or relevance of a partner's contributions might be enhanced during face-to-face interactions. By this account, the moderating power of any in-group effects may have been stronger had participants interacted directly with their partner.

Recall also that we observed reductions in social contagion on measures of correct contagion, source monitoring, and remember judgments when credibility was the manipulated partner characteristic, while these reductions were not obtained when group membership was varied. Prior research has shown that when task-relevant source characteristics are salient or relevant to a goal, they are more likely to influence whether a message should be accepted (Maddux & Rogers, 1980). In line with this view, participants may have been influenced by information about competency and confidence because it was directly relevant to the demands of completing a challenging memory task. Information about group membership, as identified by artistic preferences, is likely less relevant for evaluating the utility of a partner's contributions for the memory task. Relatedly, Davis and Meade (2013) recently found reductions in social contagion for both young and older adult participants when false items were suggested by an older but not a young adult confederate. Participants in that study may have focused on the stereotype of poor memory for older adults given the relevance of such beliefs for the recall task and thus influencing the occurrence of social contagion. Another possibility is that participants may have considered credible individuals as part of their in-group and/or individuals who were less credible as part of an out-group. Thus, our partner manipulations may have been stronger in Experiment 1 than Experiment 2 precisely because they involved multiple, interacting characteristics (i.e., credibility and group membership) rather than single attributes linked to group members. These possibilities offer potential extensions to the observed reductions in social contagion, which may prove useful for further identifying the scope of any effects.

What mechanisms might be responsible for social contagion effects and the reductions observed here? According to the source monitoring framework (Johnson et al., 1993), people fall victim to misinformation when they confuse information provided by a source with a personally experienced event. Participants in the current study indicated these kinds of confusions in their source monitoring judgments, often misattributing items that their credible partners had provided as having been something they had personally seen in the previously studied lists. This suggests that social contagion effects may be driven by confusions concerning the actual source of presented information. In Experiment 1, such confusions were less likely when participants worked with a low credibility partner. A reduction in social contagion accompanied by superior sourcing performance when working with a low credibility partner suggests that cues concerning the potential quality of a collaborator's contributions can encourage careful monitoring. In contrast, when working with a partner of high credibility, or when no credibility information is readily available or inferred, monitoring may be less likely and social contagion more likely to emerge.

As evidence for this account, the pattern of participants' source misattributions differed across conditions; relative to participants in the low credibility condition, participants in high credibility and uninformed conditions were more likely to attribute falsely suggested items to *both* their partner and the studied list. Thus, even when these participants correctly attributed misinformation to their partner, this was often accompanied by reports that the information had also appeared in the studied lists. A similar pattern was observed in Experiment 2, as participants in the in-group condition were more likely to attribute the suggested items to their partner and the list than were participants in the out-group condition. In Experiment 1, this pattern was also accompanied by a greater proportion of remember judgments for falsely suggested items among participants in high credibility and uninformed conditions, indicating that they reported conscious recollections of having seen the suggested (but never actually presented) items in the lists. These patterns are consistent with the view that participants in the high credibility and uninformed conditions were less accurate or careful when evaluating their memories, perhaps as a result of less thorough source monitoring. This aligns with results obtained by Echterhoff et al. (2005) who showed that the credibility of a source influenced how accurately, and likely how carefully, individuals assessed their memories. Thus, social contagion effects may emerge precisely because of more or less careful monitoring, and as shown in the current experiments, that monitoring can be encouraged by expectations about the value of sources' contributions for collaborative tasks.

These findings, however, are not consistent with the results of Davis and Meade (2013). While participants in that study showed reduced social contagion when working with an older as compared with a young adult confederate, no corresponding differences in source recognition were reported. One possible explanation for the discrepancy in findings in that work and the current project might involve differences in the task and stimuli. Davis and Meade asked participants to study images of household scenes as compared with the word lists employed in the current experiments. Their images were unbounded, providing a great deal of information and objects to which participants could attend. The nature of the stimuli may have encouraged a kind of focus that instantiated richer representations to which participants may not have coded source characteristics, or may have fostered confabulating rich stimuli characteristics with encoded memories for the unbounded images. While this possibility remains at this point only a conjecture, it does suggest the need for more work examining different sorts of materials to determine the generalizability of findings and for highlighting potential mechanisms involved in experiences that can incur social contagion.

Given the frequency with which individuals engage in group interactions (e.g., in classrooms, in the workplace, on sports teams, in the military, and in research laboratories), they likely rely on inferences and expectations they regularly generate about other people to determine how to handle the contributions offered by members of their participatory groups. An understanding of these effects proves important not just for theoretical considerations but also for practical applications with respect to the consequences of group work. For situations in which credit for producing accurate information is a crucial factor, an awareness of potential concerns about social contagion can inform the development of interventions intended to highlight authorship and attention to source features during initial encoding activities (Sparks & Rapp, 2011). In contrast, for situations in which the emphasis is on productions and increasing reliance on a group's productions rather than individual contributions, such as in team-building exercises, activities designed to enhance affiliations and respect for other group members can prove useful at the initial stages of an activity. These possibilities prove intriguing given that the characteristics of group members exhibit clear effects on memory.

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