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RESEARCH ARTICLE

Sharing photographs on social media enhances recollection of photograph-related details

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Abstract

The ubiquity of social media platforms allows individuals to easily share and curate their personal lives with friends, family, and the world. The selective nature of sharing one's personal life may reinforce the memories and details of the shared experiences while simultaneously inducing the forgetting of related, unshared memories/experiences. This is a well-established psychological phenomenon known as retrieval-induced forgetting (RIF, Anderson *et al.*). To examine this phenomenon in the context of social media, two experiments were conducted using an adapted version of the RIF paradigm in which participants either shared experimenter-contrived (Study 1) or personal photographs (Study 2) on social media platforms. Study 1 revealed that participants had more accurate recall of the details surrounding the shared photographs as well as enhanced recognition of the shared photographs. Study 2 revealed that participants had more consistent recall of event details captured in the shared photographs than details captured or uncaptured in the unshared photographs. These results suggest that selectively sharing photographs on social media may specifically enhance the recollection of event details associated with the shared photographs. The novel and ecologically embedded methods provide fodder for future research to better understand the important role of social media in shaping how individuals remember their personal experiences.

Keywords: captured details; memory; retrieval-induced forgetting; selective sharing; social media

Introduction

Social media have become ubiquitous and efficient means through which individuals communicate and share ideas and photographs with others (see, for example, Hutmacher et al., 2024; Stone, 2024a, 2024b). For example, in the USA, the number of social media users has steadily increased from 2005-2021, with the highest number of users aged 18–29 (84%). As of 2024, some of the most prominent social media platforms are Facebook, with 68 per cent of American users, and Instagram, with 47 per cent of American users (Pew Research Report 2024). Such individuals utilize these platforms for many reasons, such as finding a

community, communicating with family, getting news, or even as a 'picture book' (Alhabash and Ma, 2017; Stone et al., 2022; Mcclain et al., 2023). While many of these platforms may have various uses, researchers from various disciplines (e.g., sociology/communication, Bartoletti, 2011; humanities, Van Dijck, 2008) have researched and speculated about the impact and implications that social media may have on one's memory. Examining how sharing information on social media shapes the way individuals and groups remember the past has also become a burgeoning field in psychology. Although each line of research may have differing views on whether memory is contained in the head or through artefacts in the environment, this current work is most interested in the role social media plays in shaping memory. Both views about the nature of memory would nicely accommodate the current research (see Wang, 2022, for a recent collection of empirical studies; also see Bilgin and Wang, 2023; Fenn et al., 2014; Mickes et al., 2013; Sparrow et al., 2011; Stone et al., 2022; Wang et al., 2017; for a review, see Stone and Wang, 2019).

Against this backdrop, we conducted two studies to examine how selectively sharing personal experiences online impacts how individuals remember and/or forget their personal past. To this end, we attempt to extend a well-established psychological paradigm, RIF, to the context of sharing photographs on social media. In doing so, we extend a theoretically and empirically grounded paradigm to the more ecologically valid context of social media usage. The findings add to the interdisciplinary field of social media studies by revealing the process of remembering and forgetting in a controlled and yet ecologically valid setting that is prominent in the everyday life of people in modern societies.

Sharing personal experiences on social media

While a potential mnemonic consequence of having information (e.g., facts, knowledge) readily available online may result in the so-called 'Google effect' in which people tend to rely on the external sources and not store the information internally (e.g., Sparrow et al., 2011; Wilmer et al., 2017), an additional benefit of sharing personal event information online is to help facilitate rehearsal of the shared information and thus enhance memory (Stone and Wang, 2019). For example, Wang et al. (2017) asked participants to complete a diary for a week and keep a record of whether they shared any of the events online. The researchers found that personal experiences that were selectively shared online were remembered better than experiences left unshared, even after controlling for the importance and emotionality of the experiences. It remains unclear, however, whether these results may extend to sharing personal photographs which are common social media posts, especially among the younger generations.

Indeed, social media platforms have become more visually oriented over time. For example, social media users have shared over 3.2 billion photographs and 720,000 hours of videos per day (Thomson et al., 2020), and photograph-oriented social media sites have become increasingly popular (eMarketer, 2018). Thus, given the frequent sharing of photographs online, it is paramount to better understand how and when such sharing shapes the way individuals remember the shared photographs and the details that surround them. The limited work to date examining how sharing photos on social media might influence memory has shown mixed results. For example, Tamir et al. (2018) had participants document their experiences (i.e., notes about surroundings and photographs) as they went through a walking tour or while watching a TED talk. Some of the participants were told they would curate a Facebook post about their photographs and experiences at the end (but did not actually share the post on social media). The researchers found that participants who believed their experiences and photos would be shared via social media had poorer recall of said experiences than those who merely thought about their experiences. These results suggest that when given the option to share personal information and photographs, one

might not truly encode their personal experiences but offload them to an external source, such as social media (see, e.g., Sparrow et al., 2011; Wilmer et al., 2017).

Alternatively, Johnson and Morley (2021) had participants keep a diary for a week to document personal events. Participants were allowed to also share photos on Snapchat during alternating days. When given a surprise memory test, the researchers found that participants recalled more diary entries and in greater detail for the days that they shared photos on Snapchat. This finding suggests that being able to capture aspects of one's personal life in photographs and share them on social media could improve recall of the details associated with the shared photographs. However, given the nature of Snapchat, which typically deletes the shared information after 24 hours, it is unclear whether the enhanced recall was because the information was shared on social media or because of the temporal limitations of Snapchat necessitating memory (Wang et al., 2017). Furthermore, it is unclear whether participants' enhanced recall was specifically related to the shared photographs. Obviously, additional research is needed to make clear how sharing photographs on social media as a selective endeavour may impact what is remembered and forgotten.

Selective retrieval and retrieval-induced forgetting

When individuals use social media to share or post experiences, they do so selectively. This selectivity may lead to induced forgetting of related, but not shared, experiences. Selectively retrieving memories has been found to routinely induce forgetting of related but not retrieved memories, what is known *as retrieval-induced forgetting* (RIF; Anderson et al., 1994). In the original RIF study, Anderson and his colleagues developed a paradigm that consisted of three phases: (1) a study phase, in which participants studied paired associations of exemplars and categories (e.g., *fruit-apple*, *fruit-banana*, *profession-police*); (2) a retrieval practice phase, in which participants retrieved half of the exemplars for half the categories (e.g., *fruit*-apple); and (3) a final recall, in which they saw all the categories and had to recall all the exemplars. The selective nature of the retrieval practice phase created three types of memories: Rp+, practised items from the practised category (e.g., *fruit* -apple), Rp−, unpractised items from the practised category (e.g., *fruit*- banana), and Nrp, unpractised items from the unpractised category (e.g., *profession*- police). The researchers found that participants recalled more Rp+ items relative to Nrp items and recalled fewer Rp− items relative to Nrp (Rp+ > Nrp > Rp−). Thus, the selective retrieval of practised items induced forgetting of the related, unpractised items relative to the unrelated, unpractised items, what is known as the RIF effect.

The RIF paradigm has since been adapted and expanded to more personally relevant memories and exemplars (Barnier et al., 2004; Stone et al., 2013), trivial knowledge (Bilgin and Wang, 2023), photographs (Ford et al., 2004), and social media (Bilgin and Wang, 2023). For example, Bilgin and Wang (2023) recently adapted the RIF paradigm to viewing information about the COVID vaccine on Twitter and found the standard RIF effect. That is, information that was selectively 'shared online' induced forgetting of related but unshared COVID vaccine information. However, no study to date has examined RIF pertaining to people's selective sharing of personal photographs on social media.

While the applied RIF research suggests that people may show enhanced recall of the shared photographs and, in turn, RIF, the extant research related to photographs and social media suggests a more complicated picture. On the one hand, it is possible that individuals will actively engage with what they share on social media (e.g., engage in meaning making, Wang et al., 2017). Under these conditions, the enhanced recall associated with the shared photographs may be accompanied by induced-forgetting of related, but not shared, photographs, namely, an RIF effect.

On the other hand, it is possible that people share photographs without engaging with them (i.e., not actively retrieving the memory associated with the photographs). Under such conditions, there may be enhanced recall of the shared photographs but no induced-forgetting of related but not shared photographs, given that retrieval (or attempts to retrieve; Storm et al., 2006) is a necessary condition to induce forgetting. These competing possibilities need to be empirically tested.

The present studies

We utilized the RIF paradigm and conducted two studies to examine the mnemonic consequences associated with selectively sharing photographs on the social media platforms Instagram and Facebook. Specifically, we examined what was remembered or forgotten from selectively sharing experimenter-contrived photographs and event details on Instagram (Study 1) and participant-derived photographs and event details on Facebook (Study 2). We chose these two platforms because of their popularity among social media users. Although users may have different motives in using either platform (i.e., information sharing, social connectedness, etc; Alhabash and Ma, 2017), the platforms offer similar functionality for sharing photographs and narratives pertinent to our research question. We aimed at testing the generalizability of the findings across different to-be-remembered materials and different social media platforms. Additionally, since Americans aged 18–29 have the highest social media usage (Pew Research, 2024), we chose to examine this population at a Northeastern, USA college for both studies.

By using the RIF paradigm, we focused on testing (1) the mnemonic trajectory (i.e., improved or impaired recall) of the shared photographs and associated event details and (2) whether sharing photographs on social media would induce forgetting of related yet unshared photographs and relevant event details. In Study 1, the experimenter provided participants with photographs and event details to study and selectively share on Instagram. In Study 2, the ecological validity was further improved in which participants kept a diary of their personal experiences and photographs for a week and then selectively shared some of the photographs on Facebook. Although extant literature suggests competing possibilities, given the robust findings in the RIF literature, we hypothesized that the standard RIF effect would occur: Event details surrounding shared photographs would have more accurate (Study 1) and consistent (Study 2) recall than the unshared and unrelated photograph details, followed by the unshared but related photograph details.

Transparency and openness

All unidentifiable data, analysis code, and research materials are available on OSF. Study 1 can be accessed at https://osf.io/egzwq/, and Study 2 at https://osf.io/byv6f/. Participants' individualized recall tests for Study 2 are not publicly available, as they contain personal and potentially traceable photographs. For confidentiality purposes and compliance with IRB approval, only an example of the questions asked at recall is publicly available in the provided materials on OSF. Data for both studies were analysed using IBM SPSS Statistics for Macintosh, Version 27.0. The study designs and analyses were not pre-registered. However, partial data for Study 2 was analysed for a master's thesis in spring 2020 and declared in an open-ended registration on OSF. It can be accessed at https://osf.io/kf3uv/; additional data analyses are provided in the supplemental materials.

We report how we determined our sample size, all data exclusions, all manipulations, and all measures in the studies per the Journal Article Reporting Standards (JARS) (Kazak, 2018). We recruited a large sample size due to the unforeseen effects of the COVID-19 pandemic and general attrition rates (Study 1's attrition rates were high due to some participants

feeling uncomfortable posting the experimenter-contrived photographs and details on Day 2 and Study 2's attrition rates were mainly due to the length of the study and the presumption that participants might have forgot they were still participating in a study for 14 days. Additionally, given the timing of both studies having participants recruited during the pandemic, they might otherwise be preoccupied with health and safety concerns.) related to the duration and demands of these types of studies (Stone and Wang, 2019).

Study 1: The Instagram study

Method

Participants

We conducted an *a priori* power analysis using G*Power3 (Faul et al., 2007). It indicated that a sample size of 36 afforded us 80 per cent power to detect a medium effect size (f = .25) (we used 80% power as it is a standard rule of thumb for conducting a power analysis; Baker et al., 2021; VanVoorhis and Morgan, 2007). We recruited a large sample size due to the unforeseen effects of the COVID-19 pandemic and general attrition rates related to the duration and demands of these types of studies (Stone and Wang, 2019). A total of 109 undergraduate psychology students signed up through an urban American Northeast college's online recruitment platform. However, 51 participants were excluded, including 35 who failed to complete the entire study and 16 who failed at least three of the four final recall attention checks. Thus, the final sample consisted of 58 participants: 23 male (*M* age = 21.82 yrs), 48 female (*M* age = 19.79 yrs), and two non-binary people (*M* age = 24.58 yrs.); 39.6 per cent identified as Hispanic, 18.97 per cent as African American, 17.24 per cent as Caucasian, 15.52 per cent as Asian, and 12.07 per cent as Other. Based on the Social Media Questionnaire (see OSF), 98.28 per cent of participants reported they use social media moderately to very often, 1.72 per cent barely use social media, 39.66 per cent moderately/often post on social media, and 60.34 per cent barely post on social media.

Procedure and materials

The experimental design consisted of a 3 × 3 repeated-measures ANOVA with the within-subject factors of Retrieval (Rp+, Rp−, Nrp) and Details (Completely Wrong, Gist, and Completely Right). The dependent variable was the proportion of details recalled associated with the photographed events. Please see Figure 1 below for summarized timeline and procedures.

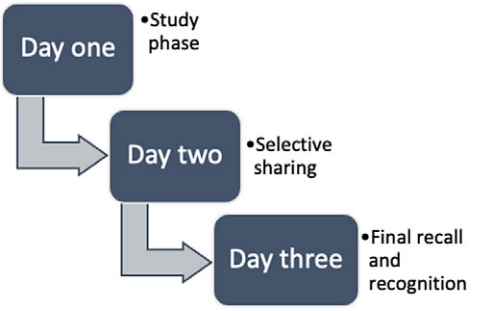

Figure 1. Study 1 timeline and summarized procedure.

Phase one: Study phase (Day 1). On Day 1, the participants came into the lab (or online) (Due to the COVID-19 pandemic) we stopped collecting in-person data in the laboratory on days 1 and 3 for Study 1 and days 1 and 14 for Study 2 and transitioned to completely online data collection. For Study 1, there were only 2 out of the 5 participants who completed the study pre-COVID-19 (laboratory and online) and all scores (except for one for Rp+CR) were within one standard deviation of the mean. For Study 2, there was no significant difference between recall from participants' scores who were in the lab versus online pre and post COVID-19, $t(88) = -1.62$, $p = .109$, $d = .24$, $95\%CI_{\text{mean differences}}[-.24, .02]$.) and provided informed consent. They were then assigned an identifier code (e.g., JJ-01) written on their consent forms to ensure their privacy throughout the data collection. The participants who were in person were informed of the study's overall procedure and provided verbal and written instructions. The online participants received an email with a Qualtrics link to Phase One, which included identical information as those who came in person. Both in-person and online participants were then instructed to study and remember 24 experimenter-contrived photographs and descriptions one at a time. Participants were given 30 seconds to study each photograph and description associated with it. Preliminary pilot work among fellow lab members indicated that 30 seconds was a sufficient amount of time to effectively learn the photographs and descriptions. The descriptions, on average, were six to seven sentences long with two hashtags. These descriptions had details that related to the photograph, such as a photograph of three women laughing on yoga mats and description details relating to a workout session with friends (see two examples of photographs and descriptions in Figure 2 with the coding scheme).

Four different stock photos that did not have any overlap with one another were associated with each category: Food, Family, Work, College, Friends, and Weather (see OSF for further examples). The second author chose these six categories and exemplars anecdotally based on her Instagram experience when viewing what other individuals have chosen to share. Similarly, in choosing the photographs and details, we made no effort to ensure the photographs and details mirrored the experiences of our participants. In doing so, we are hopeful that our results will speak more to the mnemonic impact of sharing photographs and details on social media and less so to any individual differences that may make some photographs more or less memorable to our participants (e.g., a photograph related to an activity the participant(s) frequently engage in). The slideshow displayed the Food category first and the Weather category last, as they were fillers to control for any unforeseen influences associated with primacy and recency effects (Anderson et al., 1994). Thus, only the photographs and descriptions in Family, Friends, College, and Work were analysed. The four categories and the photographs within each category were also randomised.

After studying the photographs and descriptions in the slideshow, the experimenter provided participants with instructions on how to complete Phase 2, that is, how to selectively share their photographs on Day 2. Participants then provided their contact information to the experimenter so that participants would receive reminder text messages and emails with the selected photographs and descriptions to share on Instagram. Additionally, participants provided their Instagram handles to the experimenter so that the experimenter could verify that the participants correctly followed instructions during the selective sharing phase. Participants who completed Phase One online had their Instagram handle recorded via Qualtrics. In total, Phase One (informed consent, the slideshow, and before and after instructions) lasted about 30 minutes.

Phase two: Selective sharing phase (Day 2). On Day 2, the experimenter used the app *Textedly* to send reminder texts to participants. The texts instructed participants to check their emails for the photographs and descriptions and reminded them to share them on their Instagram accounts. The experimenter chose which photographs/categories to share on Instagram, the selection of which was counterbalanced across participants. For example, a participant would receive instructions to share two photographs and descriptions each from the

Original Description
"My friends and I love to do different things when we hangout. We decided to have two outings a month. We wanted to be more active, so my friend found a hot yoga place to try out. It turned out to be great! We learned new poses and did some meditation, all while breaking a sweat. Afterwards we tried a vegan spot and had some healthy smoothies. #Fitness #GirlsDay"
= 8 possible points

Participant #1 Response:	**Participant #2 Response:**	**Participant #3 Response:**
"They love to do different things so they found out a hot yoga place and it turned out to be great. They learned new poses and did some mediation." **= 4 Completely Right points**	"They were talking about fitness or yoga." **= 1 Gist point**	"This is an activity she does to relax, when she has time." **= 1 Completely Wrong point**

Original Description
"My job has the best holiday parties! This year there was an open bar, food, a toy drive, and a raffle that gave 10 people extravagant gifts. We had a photo booth and Santa hats to wear for the night. It is always nice to see my coworkers and bosses let loose, and not be in work mode. It was a great night full of fun and stimulating conversation. #HolidayParty#MyJobIsTheBest"
= 7 possible points

Participant #1 Response:	**Participant #2 Response:**	**Participant #3 Response:**
"My jobs/offices Christmas parties are the best. It is a place where they have fun and relax. They had games and raffles for prizes (I think 10 prizes). " **= 3 Completely Right points and 1 Completely Wrong point**	"They are celebrating a holiday**"** **= 1 Gist point**	"New years day" **= 1 Completely Wrong point**

Figure 2. Coding examples from the 'Friends' category and 'Work' category.

'Family' and 'Friends' categories. These four photographs, along with the original description from the study phase slideshow, were attached to the email participants received. By selectively sharing half of their pictures from half of the categories, three recall conditions were created: shared (Rp+; e.g., half of the Family and Friends photographs and descriptions), related but not shared (Rp−; e.g., the other Family and Friends photographs and descriptions), and unrelated and not shared (Nrp; e.g., all the Work and College photographs and descriptions).

Along with sharing the photographs and the original descriptions from the study phase, participants also included #jjsocialsd in their post. The inclusion of this hashtag allowed the experimenter to find participants posts on Instagram and monitor the participants' posts and social interactions and ensure they completed Phase Two. Participants were informed to

reply 'done' to the email after completing the task. After sharing on Instagram, the email instructed participants to delete the pictures from their phones so they could not further rehearse outside of the confines of Instagram. Participants were instructed to view 'likes' and reply to comments on their Instagram posts just as they normally do. It was hoped that this activity would increase the ecological validity of the procedure (however, some participants' comments consisted of their followers asking if the participants were hacked or going along with the charade).

Phase three: Final recognition and recall (Day 3). On Day 3, participants returned to the lab or received a Qualtrics link via email. The experimenter gave in-person participants verbal and written instructions about the final recognition and recall test. Online participants received instructions via email as well as the Qualtrics link. During the recognition and recall test, participants were presented with the 24 photos they saw during Phase One. Four of those photographs had been shared on Instagram in Phase Two from the categories: Family, Work, College, and Friends. In addition to these repeated photographs, participants also saw six randomly presented lure photographs (i.e., category related stock photographs not previously seen by the participants). As a result, they saw a total of 30 photographs. The presentation of the photographs was blocked by category, with participants viewing the six categories in the same order they received during the study phase. They were shown a photograph and asked if the photograph was 'old' (seen on Day 1) or 'new' (never seen before). If 'old', they typed as many details as they could remember from the description. If 'new', they typed 'NA' (i.e., not applicable). There were four attention checks (e.g., *What is 5 + 5?* and *Select the word old.*) randomly presented throughout the final recall and recognition phase to ensure participants paid attention.

After finishing the recognition and recall tests, participants read and completed 22 questions concerning social media use, two questions that measured posting and usage frequency (e.g., 'How often do you post on social media?'), and additional questions from the POMMS (Stone et al., 2022; Wang, 2022), which measured the motivation (self, social, directive, therapeutic) behind sharing personal experiences on social media (The results from these scales are provided in supplemental materials but are not directly relevant to the research question and, thus, are not considered further.). Participants selected answers (e.g., 'To document my personal experiences', 'To get attention', etc.) on a scale from 1 (*Not at all*) to 5 (*Exactly my reasons/Often*). After completing the questionnaires, participants provided demographic information which included questions about age, gender, and race. Once participants finished the demographics form, they were given a debriefing form summarizing the study and thanking them for their time. After finishing the study, the experimenter awarded participants research credits. In total, Phase Three (recognition/recall test, social media questionnaire, and demographics) lasted about 60 minutes.

Coding

For Study 1, the photograph descriptions included seven to eight important narrative details. The accuracy of participants' responses about each detail was evaluated and categorized into three categories: Completely Right (CR), Gist (G), or Completely Wrong (CW). Only one category could be assigned to each detail, thus allowing participants responses to include combinations of CR, G, and CW depending on how much detail they recalled/included in their description. Omissions of other details were not coded; only the details participants recalled received these scores. Thus, a score of one was given for Completely Right if the detail provided by the participant matched the original detail verbatim. A score of one was given for G if the detail provided by the participant was similar but not verbatim to the original detail. A score of one was given for CW if the detail provided

by the participant did not match the original detail at all. For further explanation, see the coding scheme in OSF and Figure 2 below.

The proportional response (These proportional averages are conditional, meaning that only photographs that were correctly recognised were then shown for the recall test. That is, the number of details in the denominator related to the number of details in the photo descriptions of a correctly recognised photo) score of Rp+, Rp−, and Nrp was calculated by dividing the number of details scored (i.e., Completely Right, Gist, and Completely Wrong) by the total number of possible responses (i.e., seven or eight). These scores were then averaged to create a total mean score for each proportional retrieval score (e.g., Total Rp+Completely Right), resulting in nine scores from each of the 58 participants. The results were analysed and reported based on the proportional retrieval score and the sharing status of the photographs and their descriptions.

Twenty-nine percent of the participants' data were dual coded using the percent agreement method (Syed and Nelson, 2015), resulting in an interrater reliability score of .94. However, there were some disagreements among the coders regarding when to assign a point for G or CR. These disagreements often reflected concerns about whether answers could be considered explicitly correct or incorrect versus if answers could be similar but incorrect (see OSF for an example). The coders went through each disagreement explaining their own rationale for the points and came to an agreement. After dual coding, the second author coded the remaining 71 per cent of the responses.

Results

Recognition

In the recognition test, participants identified whether the photographs were 'new' (i.e., not seen on Day 1) or 'old' (i.e., seen on Day 1). The participants correctly recognised on average 89.7 percent of Rp+ photographs, 63.4 percent of Rp− photographs, and 63.1 percent of Nrp photographs as 'old'. A chi-square test of independence was performed to assess the relationship between retrieval type and recognition accuracy. There was a significant relationship between the two variables, $X^2(2,934) = 52.32$, $p < .001$, suggesting that the participants had better recognition of the shared photographs compared to all other unshared photographs.

Retrieval and details

To examine whether RIF occurred in Study 1, we ran a 3 (Retrieval: Rp+, Rp−, and Nrp) × 3 (Details: Completely Wrong, Gist, and Completely Right) repeated-measures ANOVA, using averaged proportional scores of recalled photograph-related details as the dependent variable on correctly identified previous photographs from the recognition test. Higher scores indicated better accuracy in the CR category, whereas higher scores in CW indicated worse accuracy. The results, with a Huynh-Feldt correction, revealed a significant main effect for retrieval, $F(1.598, 91.066) = 5.935$, $\eta p^2 = .094$, $p = .007$, and with a Greenhouse-Geisser correction, a significant main effect for details $F(1.44, 82.327) = 6.053$, $\eta p^2 = .096$, $p = .008$, and a significant interaction between retrieval and details, $F(2.489, 141.875) = 8.146$, $\eta p^2 = .125$, $p > .001$ (These corrections were used because our assumption of sphericity was violated with this sample i.e., Mauchly's Test of Sphericity was significant. This means Type 1 error for the repeated measures test was too liberal, so we corrected to get a more accurate F ratio. See https://statistics.laerd.com/statistical-guides/sphericity-statistical-guide.php.).

Planned pairwise *t*-tests revealed that the main effect for retrieval was driven by the fact that Rp+ ($M = .093$, $SD = .05$) had higher proportional details recalled (accurate or otherwise) compared to Rp− ($M = .081$, $SD = .03$), $t(57) = 2.4$, $p = .028$, $d = .29$, 95 per cent

$CI_{mean\ differences}$[.001, .023] and Nrp (M = .078, SD = .03), $t(57)$ = 3, p = .004, d = .36, 95 per cent $CI_{mean\ differences}$[.005, .025]. The comparisons also revealed that participants had more instances of CW details (M = .082, SD = .06) and CR details (M = .112, SD = .10) relative to G details (M = .058, SD = .05), $t(57)$ = 2.4, p = .024, d = .43, 95 per cent $CI_{mean\ differences}$[.003, .044] and $t(57)$ = 3.375, p = .002, d = .68, 95 per cent $CI_{mean\ differences}$[.087, .021], respectively.

We also conducted planned pairwise t-tests to examine the interaction between retrieval and details (see Figure 3 for means). The analyses revealed that Rp+ Completely Right details (M = .15, SD = .15) had significantly higher recall when compared to Rp+ Completely Wrong (M = .06, SD = .08), Rp− Completely Wrong (M = .09, SD = .08), and Nrp Completely Wrong (M = .09, SD = .07) (p's < .01) as well as several other significant comparisons that show Nrp Gist (M = .05, SD = .06) had the worst recall in each respective comparison (all t -test interaction comparisons are available in the supplemental materials).

Furthermore, the number of 'likes' and comments for each shared photograph was collected and analysed. Six participants received between 50 and 113 'likes' on their posts and 0–15 comments, while the other 52 participants received 0–47 'likes' on their posts and 0–15 comments. We conducted a correlational analysis between the number of 'likes' participants received and their aggregated scores for Rp+ Completely Right, Rp+ Gist, and Rp+ CW and found no significant relationships (all p's > .05, see table in Supplemental materials). As a result, the mnemonic influence of 'likes' and comments associated with social endorsement (Sherman et al., 2016) did not seem to explain the enhanced recall of the photographs and details shared on social media (see Limitations and Future directions for further rationale).

Discussion

The results of Study 1 partially support our hypothesis: sharing photographs and details on Instagram enhanced later recognition of the photos themselves and enhanced recall of the details surrounding the shared photos. These results provide additional support for the work of Johnson and Morley (2021), Mickes et al. (2013) and Wang et al. (2017) who all found sharing information on social media enhances memory of the shared information. Although

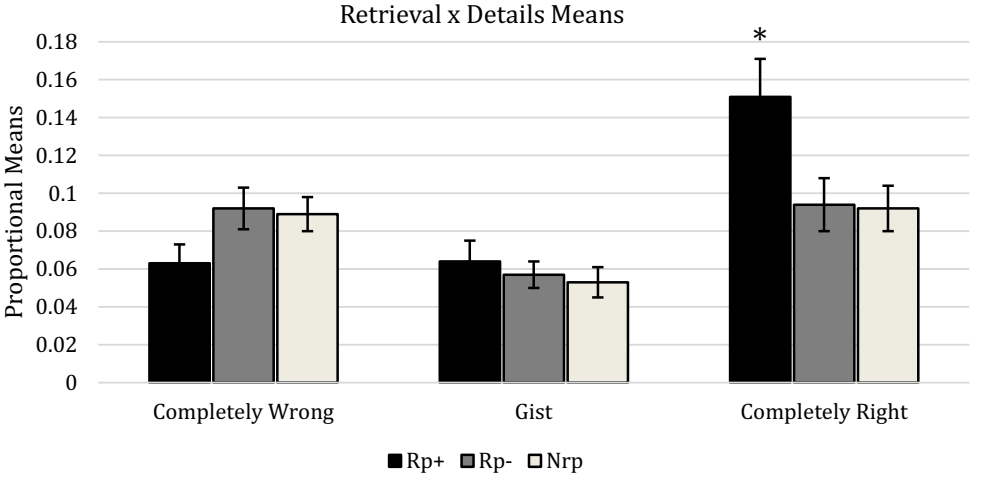

Figure 3. Interaction effects from mean proportional differences of retrieval type and details in Study 1.
Note: Mean proportional scores for the Completely Wrong, Gist, and Completely Right surrounding details of the photographs that were either shared (Rp+), related but not shared (Rp−), or unrelated and not shared (Nrp) online. Higher scores in the Completely Right category indicate better accuracy, whereas higher scores in Completely Wrong indicate worse accuracy. *= Rp+ Completely Right had significantly better accuracy of the photograph – related details compared to other groups.

the participants did not write the descriptions personally, the descriptions mimicked the personal anecdotes one might provide when sharing their own personal photographs on social media.

Additionally, the results support the findings from Bilgin and Wang (2023) that information that was shared and seen on social media was more memorable. However, this enhanced memorability for the Twitter study (Bilgin and Wang, 2023) also led to induced forgetting (i.e., shared information was remembered with more accuracy while unshared but related information was remembered with less). We did not find a similar effect. This discrepancy may have occurred because of methodological differences between the studies: providing participants with social media information (Bilgin and Wang, 2023) as opposed to participants sharing the information on social media (e.g., participants may not actively retrieve the information when sharing it on social media; more on this in the General Discussion).

Although this study extended psychological research to sharing photographs on social media, the photographs and descriptions were experimenter-contrived and thus lacked ecological validity with respect to the material individuals typically shared on social media. Additionally, while the participants saw the information on Day 1 and were tested on it during Day 3, we have no way of knowing if the to-be-remembered information was truly encoded on Day 1. As such, it is unclear whether the results of Study 1 are due to poor(-er) encoding or retrieval processes. In other words, we assume the results of Study 1 are due to the retrieval process, but it is also possible that encoding processes (or lack thereof) influenced our results. The combination of the non-meaningful nature of the material and not controlling for encoding issues may also explain the overall low memory performance (i.e., 15% accurate recall of Rp+ items). Taken together, we found that in Study 1 participants had better recognition of the photos that were shared to social media and recalled more correct details relating to the photos shared on social media, but this enhanced recall did not induce forgetting of the unshared details from related categories.

We therefore sought to expand the findings in Study 2, in which we controlled and examined mnemonic differences between details captured and not captured in photographs and whether the photographs were shared on social media or not (Fawns, 2014; Soares and Storm, 2018; Berry, 2019). The goals of Study 2 were to use more ecologically valid material and provide a baseline to ensure our results are due to our manipulation of retrieval conditions and not to any encoding issues. Specifically, Study 2 included personally experienced photographs and had a pre- and a post- memory test about the captured and uncaptured details in these photos. Although the Study 1 results indicated that sharing photographs and event details on Instagram enhanced recall and recognition, we want to explore whether the results generalized to other social media. Hence, in Study 2, we used Facebook. Additionally, given that Study 2 used participants' own photographs, we considered the visual perspective captured by the photographs (i.e., details captured within a photograph versus not captured but still essential to the experience). This is especially important given recent research showing that the third-person perspective adopted in photographs can alter one's memories of the experience (Berry, 2019).

Study 2: The Facebook study

Method

Participants

An *a priori* power analysis using G*Power3 (Faul et al., 2007) indicated that a sample size of 36 afforded us 80 per cent power to detect a medium effect size (f = .25). We recruited 92 undergraduate psychology students through the same online recruitment platform as Study 1. We excluded 53 participants, including one who did not meet the inclusion criteria

of having a Facebook account, 10 who failed to complete the recall test, 20 who dropped out within the first six days of the study, and 13 who did not follow the instructions (i.e., not including extra pictures, not creating a Facebook post, or including pictures of themselves). Thus, the final sample of Study 2 consisted of 39 participants (M_{age} = 19.26, 69% female).

Procedure and materials

The study had a 3 × 2 within-subjects design with repeated measures of Retrieval (Rp+, Rp−, Nrp) and Details (captured, uncaptured), that is details either captured directly within the photos or inferred from the photos and details that are not captured within the photos (further distinction is in the coding section). Unlike Study 1, here we focused on consistency between a pre- and post- measurements. Thus, the dependent variable was the aggregated consistency of recalled details related to the photographed events. Please see Figure 4 below for summarized timeline and procedures.

Phase one: Information and diary setup (Day 1). Phase One was dedicated to obtaining informed consent, instructions, assigning participant identification numbers, and agreeing on a method of communication (i.e., email or phone) to set up the online diaries. Participants came into the lab (or online) and provided informed consent. In-person participants filled out a brief questionnaire in the lab wherein participants verified whether their Facebook profile was public, used Facebook, had daily internet access, and had a device to upload photographs. They also provided a preferred email or phone number to receive the online surveys via email or text message for the remainder of the study. This questionnaire also included demographic questions such as age, sex, and education level. Online participants filled out this questionnaire online through Qualtrics once consent was obtained. The experimenters gave the in-person participants verbal and written instructions (on completing the remaining phases of the study) while the online participants were given written online instructions through the same Qualtrics link.

These instructions stipulated that the participants would be sent an online diary for six days straight, which would require them to take photographs and answer various questions about the photographs. Most importantly, in accordance with our IRB protocol, all participants

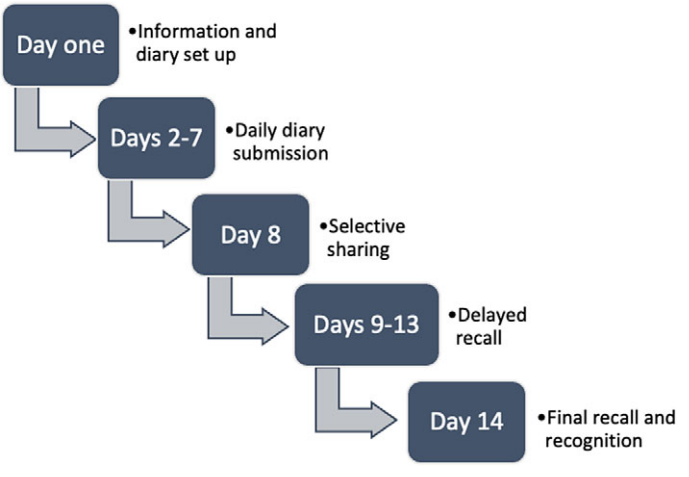

Figure 4. Study 2 timeline and summarized procedure.

were instructed not to upload any photographs with identifiable information, such as 'selfies' or photos with family and friends, to the Qualtrics daily diaries. They were further instructed to save all submitted photographs so that they may share some of them on their Facebook account during Phase Three. In total, Phase One (informed consent, before and after instructions, obtaining contact information, and demographics) lasted about 30 minutes.

Phase two: Daily diary submission (Days 2–7). Phase Two consisted of participants receiving either an email or a text message (depending on which method of communication they selected during Phase One) with a link to submit their daily diaries. In this diary, participants submitted photographs of an event or experience in their personal life related to six categories: Food, Weather, Work, College, Professional Relationships, and Personal Relationships, with one photo per category each day. For each photograph participants took, they answered 15–18 questions (The variation in the number of questions is due to a skip logic applied to 3 questions per photo (i.e., if they answered one question in a certain way, they would receive a follow-up question or move on to the next question). For example, the question 'Who was with you at the time of the picture?', if they answered 'no one', they skipped to the next question; if they answered 'friends', 'family', 'colleagues', or 'significant other', they had the follow up question 'Did they take pictures as well?'.) (e.g., multiple choice, slider scale, and free response) about the captured and uncaptured details in these photos. For example, captured detail questions include 'What is the environment surrounding this photo?' or 'Is the location of this photo something you typically see/encounter on a day to day basis?', while uncaptured detail questions include questions such as 'At the moment this photo was taken, what colour best describes what you were wearing on the top half of your body' or 'Did anything significant happen to you at the time of this photo?'. By the end of day seven, participants had submitted 36 photographs and answered 15–18 questions per photograph. In total, uploading photographs and answering the detailed questions about each photograph took about 30 minutes per day.

Phase three: Selective sharing (Day 8). During Phase Three, participants received either an email or a text message (depending on which method of communication they selected during Phase One) with a link and instructions for selectively sharing half of the photographs from half of the categories they took during Phase Two to their Facebook page. Food and Weather were not categories of interest since they were used for primacy and recency effects in the recall tests (Anderson et al., 1994). Thus, the only categories of interest used in this phase were College, Work, Personal Relationships, and Professional Relationships. All photographs and categories of interest were counterbalanced across participants. Participants received instructions such as, 'Please create one Facebook post with the 1st three photos you submitted in the *personal relationships* category and the last three photos you submitted in the *work* category. Please use the hashtag #JJSocialMediaCog and copy and paste your Facebook URL link in the space below'. By selectively sharing half of their photographs from half of the categories, three recall conditions were created: shared (Rp+; e.g., half of the work and personal relationship photographs), related but not shared (Rp−; e.g., the other work and personal relationships photographs), and unrelated and not shared (Nrp; e.g., all the college and professional relationship photographs).

Phase four: Delayed recall (Days 9–13). Participants were instructed to interact with their Facebook account as they normally would, including the photographs shared for this study (i.e., respond to comments or look back at their posts when they receive any 'likes'). During this phase, participants were not required to do anything for the study.

Phase five: Final recognition and recall test (Day 14). In this last phase, participants returned to the lab (or online) to complete a recognition and recall test based on the information they provided during Phases Two and Three. These tests were individualized with their photographs, so each participant had a different recall test based on their personal experiences. The only constant in each recall test was that their Food and Weather photographs were presented first and last (for primacy and recency effects). In contrast, the remaining four categories were randomly presented in the middle. During the recognition and recall test, participants were presented with the 36 photos they submitted during Phase Two. Six of those photographs had been shared on Facebook in Phase Three from the categories: Work, College, Professional Relationships, and Personal Relationships. In addition to these repeated photographs, participants also saw 12 randomly presented lure photographs (i.e., category related stock photographs not previously seen by the participants). As a result, they saw a total of 48 photographs. We included the lure photographs as a check to ensure that participants could differentiate between the photos they took and stock photos. It was also a manipulation check to ensure participants took the protocol seriously. They were asked, 'Have you seen this photograph before?' for each photo (There was a concern that because participants took photos during the pandemic, there may not be much variation between the categories and days if they were confined to their homes. However, when looking at the photos, there was adequate variation in the categories and days.). If they answered 'yes', they were tasked with answering the same questions per each photo they saw during Phase Two. Once participants finished the recognition and recall test, they were given a debriefing form summarising the study, thanked for their time, and awarded credit for their participation. In total, Phase Five (recognition/recall test and debriefing) lasted about 60 minutes.

Coding

In Study 2, participants' answers were coded with change scores (scores representing the number of items remembered either completely right, gist, or completely wrong). That is, participants saw the same questions for each category from each photograph during Phase Two (daily diary) and again during Phase Five (recognition and recall test). We did not code the three free-response (These questions included 'if anything significant happened please describe', 'why did you choose this picture for this category', and 'provide any additional information'. Of the few participants who answered these questions, they included *because that's the category (x)*, or *this is a picture of category (x).* So, we did not code or include these answers in the analyses.) questions, so the 15 multiple-choice and slider scale response questions (i.e., those relating to the captured and uncaptured details in each photo) were the only ones included in the analyses. Thus, the present data were coded as follows: for every answer to a question that matched perfectly between the diary and final recall, they received a score of 0; for every answer that did not match perfectly but was similar (e.g., casual shorts versus athletic shorts; 56 degrees versus 58 degrees; sweater versus sweatshirt) they received a score of 1; and for every answer that did not match at all (e.g., jeans versus a dress, indoors versus outdoors, morning versus evening) they received a score of 2. Note: as a result of this coding scheme, scores closer to 0 equate with better consistency, while scores closer to 2 equate with worse consistency.

After all the questions were coded, the first author then organized the questions in terms of whether they were associated with the shared (Rp+), related but not shared (Rp−), or unrelated and not shared (Nrp) photographs. We also noted how many 'likes' and comments were received on their Facebook post from Phase Three. We then aggregated the participants' scores for each question to get one score per question per retrieval group (i.e., 15 Rp+, 15 Rp−, and 15 Nrp scores per participant).

As indicated above, we asked 15 questions about each photograph, which fell into two classes: those that involved details captured by the photographs and those that involved details that could not be observed in the photograph but were relevant to the taking of the photograph, such as what the photographer was wearing. We thus coded these details accordingly to examine whether mnemonic differences emerged (or not) across the various retrieval conditions. Again, although the photographs only took a snapshot of an experience (Fawns 2014), the details participants answered about the event in the diary contained both items that could potentially be captured in the photograph (e.g., *what is the environment surrounding this picture?)* or integral to the experience but not captured in the photograph (e.g., *what colour were you wearing on the bottom half of your body?).* With this distinction in mind, we further divided the averages associated with the three retrieval types, Rp+, Rp−, and Nrp, into six classifications: Rp+ captured, Rp+_uncaptured, Rp− _ captured, Rp− _uncaptured, Nrp_captured, and Nrp_uncaptured. We then averaged the participants' scores to get one score per retrieval and detail group, leaving us with six scores from each of our 39 participants.

Twenty percent of the participants' data were dual coded using the percent agreement method (Syed and Nelson, 2015), resulting in an interrater reliability score of .86. There were disagreements, mainly around confusion as whether to code a 1 or 2. To resolve this confusion, we used the rationale of whether answers could explicitly be correct or incorrect versus if answers could be similar but incorrect. For example, when asked what the approximate temperature is, an initial answer of '58 degrees' and a final recall answer of '56 degrees' are similar but incorrect or gist (coded as a 1). Whereas, when asked about the surrounding environment, an initial answer of 'outdoors' and a final recall answer of 'indoors' are completely wrong (could not be coded as a 1).

Therefore, we decided that any question that had 5 or fewer multiple-choice answers was explicit and should only be coded as either completely right (0) or completely wrong (2). For example, when asked about the environment surrounding the photo, there are only 3 options (indoors, outdoors, combination of both) so a participants' answer either matched what they initially wrote or did not match, making it either completely right or completely wrong. Any question that was a slider scale or multiple-choice with six or more answers was not explicit and could be coded as completely right (0), gist (1), or completely wrong (2). For example, when approximating how long it took one to travel from their residence to the place where the photo was taken, they could slide the scale from 0 to 100 minutes, thus allowing for a participants' answer to be close to their initial answer, making it a gist. Once the dual coders agreed on the coding scheme, the first author coded the remaining 80 percent of the responses.

Results

Recognition

Photo recognition was measured during the final recognition and recall test, in which participants were asked, 'Have you seen this photo before' and answered 'yes/no' before proceeding to the following questions. Participants correctly recognised on average 97 percent of Rp+, 96 percent of Rp−, and 94 percent of Nrp photos when they reported 'yes', indicating they recognised them from their daily diaries. A chi-square test of independence was performed to assess the relationship between retrieval type and recognition accuracy. There was not a significant relationship between the two variables, $X^2(2,724) = 2.22$, $p = .33$ suggesting participants recognised their photographs regardless of whether they were shared or unshared.

Retrieval and details

To examine if RIF occurred in Study 2, we ran a 3 (Retrieval: Rp+, Rp−, and Nrp) × 2 (Details: captured and uncaptured) repeated measures ANOVA, using averaged proportional scores of recalled items as the dependent variable on correctly identified previous photographs from the recognition test. Unlike Study 1, however, lower scores indicate higher consistency (i.e., less changes in memory from diary and recall test) in Study 2. The results revealed a significant main effect of details for recalled items, $F(1,38) = 62.267$, $\eta_p^2 = .621$, $p < .001$, which reflects the fact that participants, overall, recalled captured details ($M = .46$, $SD = .30$) with higher consistency than uncaptured details ($M = .81$, $SD = .33$). There was no significant main effect of retrieval for recalled items, $F(2,76) = 1.132$, $\eta_p^2 = .029$, $p = .328$, and with a Huynh-Feldt correction, there was no significant interaction between retrieval and details for recalled items, $F(1.726, 65.652) = 2.752$, $\eta_p^2 = .068$, $p = .079$.

Although the interaction was not significant, we performed planned pairwise *t*-tests (see Figure 5 for all means; again, note that lower scores indicate higher consistency). The analyses revealed Rp+ captured details ($M = .40$, $SD = .29$) had significantly better consistency when compared to Rp+ Uncaptured details ($M = .82$, $SD = .33$), Rp-Uncaptured details ($M = .82$, $SD = .32$), Nrp Captured details ($M = .50$, $SD = .33$), and Nrp Uncaptured details($M = .80$, $SD = .33$) (p's < .01), while uncaptured details (regardless of retrieval type) had the worst consistency (i.e., more changes in memory from diary to recall test) in each respective comparison. (All *t*-test interaction comparisons are available in the supplemental materials).

Furthermore, the number of 'likes' and comments for each shared photograph was collected and analysed. Six participants received between 5 and 10 'likes' on their posts and 2–4 comments, while the other 33 participants received 0–4 'likes' on their posts and 0 comments. We conducted a correlational analysis between the number of 'likes' participants received and their aggregated scores for Rp+ Captured details and Rp+ Uncaptured details and found no significant relationships (all p's > .05, see table in Supplemental materials). As a result, the mnemonic influence of 'likes' and comments associated with social endorsement (Sherman et al., 2016) did not seem to explain the enhanced recall

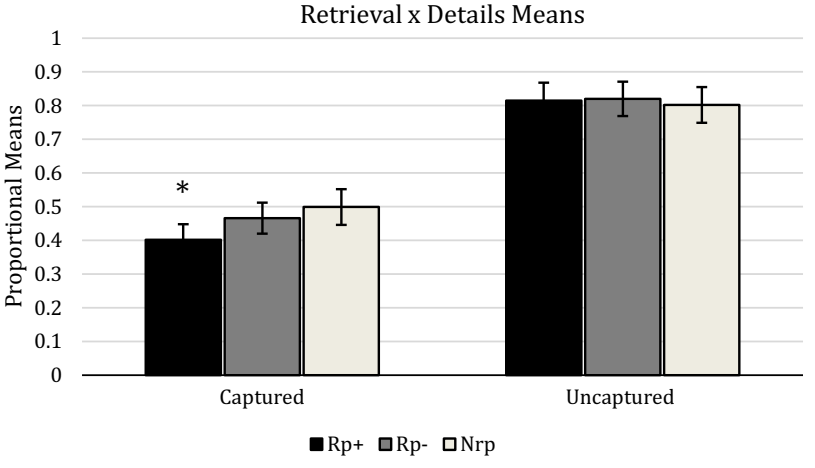

Figure 5. Interaction effects from mean proportional differences of retrieval type and details in Study 2.
Note: Mean consistency scores for the captured and uncaptured details in the photographs that were either shared (Rp+), related but not shared (Rp−), or unrelated and not shared (Nrp) online. Lower scores indicate better consistency (i.e., less changes in memory from diary to recall test). *= Rp+ captured had significantly better consistency compared to other groups.

of the photographs and details shared on social media (see Limitations and Future Research for further rationale).

Discussion

Participants remembered the captured details of the shared photographs (Rp+) more consistently relative to all other conditions, and, overall, participants remembered captured details more consistently than non-captured details (Sutton, 2010; Barasch et al., 2017; McCarroll, 2019). These results support prior research demonstrating improved recall of personal information shared on social media (Wang et al., 2017; Bilgin and Wang, 2023). However, unlike Wang and colleagues, again, counter to our hypothesis, they did not find any evidence of induced forgetting of related but unshared information (RIF effect; Bilgin and Wang, 2023). It is possible that this lack of RIF may be the result of individuals not *actively* retrieving the memories when they share personal photographs on social media. Rather, individuals *passively* share memories in a more ritualistic manner (see Hoskins and Halstead, 2021; and more on this in the General Discussion). Taken together, we found that in Study 2 participants had nearly perfect recognition of all of the photos, regardless of if they were shared on social media or not, and had more consistent memories of the captured details from the photos shared on social media. This enhanced consistency, however, did not induce forgetting of the unshared details (captured or uncaptured) from related categories.

General discussion

The primary goal of the present studies was to examine whether selectively sharing photographs on social media facilitates or impairs the recall of the details from the shared photographs and/or induces forgetting of the details surrounding related but unshared photographs. Study 1 revealed that sharing experimenter-contrived photographs on Instagram improved accurate recall of the details surrounding the shared photographs as well as enhanced recognition of the photographs that were shared online. These results were further supported and refined in Study 2, in which sharing personal photographs on Facebook suggested more consistent recall of the captured details relative to the uncaptured details and nearly perfect recognition of all personal photographs, regardless of whether they were shared or not.

Photographs and social media

The present results are consistent with prior research indicating enhanced recall for information shared on social media (Mickes et al., 2013; Wang et al., 2017; Johnson and Morley, 2021; Bilgin and Wang, 2023). For example, Johnson and Morley (2021) found that when social media (Snapchat) usage was available, participants had better recall of the central event elements captured in their daily diaries compared with when they were asked to refrain from using social media. In our study, however, we expanded these findings by using Instagram and Facebook, which have more permanent postings than the temporality of Snapchat. Similarly, Wang et al. (2017) found that participants recalled more information about events shared on social media and rated those shared events as more important. In our study, we expand these findings by reducing selection bias in terms of what was shared, in favour of a more controlled user experience (i.e., not having participants potentially self-select photographs that might be more memorable). Lastly, Bilgin and Wang (2023) found that participants had the best recall for information shared on social media (Twitter), and this enhanced recall induced forgetting of the unshared information. In our study, however, we expanded these findings by having users move away from merely consuming social

media to producing social media content as well as sharing more personal content (see Stone and Wang, 2019). Although these studies show better overall recall generally when sharing information on social media, the results of our studies suggest that the enhanced recollection associated with sharing information on social media is limited to the photograph-related details in the shared photographs relative to the uncaptured details.

Enhanced recall of photograph-related details

Our results first suggest it was not just the mere act of taking photographs and attending to the details that enhances consistency; rather, it was the photographs (Study 1 and 2) and the details relating to those shared experiences (in the captions for Study 1 and in the diary for Study 2) on social media itself that led to more consistent recall (Stone and Wang, 2019; Johnson and Morley, 2021). While Standing et al. (1970) suggest photographs in general are more memorable, what is captured within these photographs may be more readily available to us compared to the details that were uncaptured or 'out of view' (Barasch et al., 2017). Therefore, it is possible that selectively capturing events in a photograph (Sutton, 2010; McCarroll, 2019), selectively sharing the photograph on social media (Mickes et al., 2013; Wang et al., 2017), as well as the mnemonic benefits of revisiting the post on social media (Stone and Wang, 2019), could enhance recall of captured details (relating to the practice effect found in the RIF paradigm; Anderson et al., 1994); however, this enhanced memorability is not enough to suppress unshared but related details (i.e., lack of RIF).

Lack of RIF

Stone and Wang (2019) suggest that selectively sharing a memory and selectively retrieving a memory might have the same underlying process. That is, the selectivity might improve recall of the selectively shared and retrieved information and, in turn, induce forgetting of related information. However, while both sharing and retrieving might lead to the same *mnemonic benefit*, the present results suggest that sharing a photograph on social media does not induce forgetting of related photographs/details. The exact reason as to why remains unclear; however, it is possible that sharing a photograph does not equate with active retrieval (Hoskins and Halstead, 2021). Indeed, as the name of the paradigm implies (*retrieval*-induced forgetting), 'retrieval' is a necessary component. If an individual does not actively retrieve a memory, one would not expect induced forgetting. However, in studies like Cuc et al. (2007), active retrieval might not be necessary when one is monitoring for fluidity of the remembered event (however, this relates more to socially shared retrieval-induced forgetting (SSRIF), which requires rehearsal of another person's memories.

Since participants saw the photographs in the recognition test before proceeding to the recall tests in both studies, it is possible they did not need to retrieve the memories actively but merely recognize the photos and recall the photograph-related details within the photos (at least for Study 2), indicating no differences across retrieval groups. However, because participants were more exposed to the photograph-related details captured in their shared photographs, presumably it is possible that the frequency of exposure, rather than the frequency of retrieval, enhanced the recall of those specific details (Stone and Wang, 2019). Although participants did have better memory for the photograph-related details associated with the shared photographs, perhaps the association formed through sharing was not strong enough to induce forgetting of similar unshared photos' details or RIF.

Additionally, most RIF studies utilize repeated practice and retrieval of items in order to form this association (for example, Barnier et al., 2004; Karpicke and Roediger, 2007; Stone et al., 2013); however, in our studies we assumed that when participants checked 'likes' or comments on their post, this would equate to repeated exposure, although we have no way

of knowing how many times participants *actually* looked at their posts (more discussion on this in Limitations and Future Research). Alternatively, perhaps our design of partially cued recall (in Study 2 at least) allowed the details and categories to blur across retrieval groups, where the photographs and details perhaps did not compete for retrieval, facilitating interconnected components resistant to RIF (Anderson and McCulloch, 1999; Stone and Wang, 2019). Regardless, further research is necessary to examine if/when selectively sharing personal photographs/information on social media may or may not lead to induced forgetting of related but unshared photographs/ information.

Limitations and future research

While these studies are the first of their kind to extend RIF to sharing photographs and details (experimenter-contrived and personally experienced) to social media, they are not without their limitations. First, both studies started during the onset of the COVID-19 pandemic. Despite being in a pandemic, we were able to recruit an adequate sample; however, attrition rates were high due to the demands of the study and likely health and wellness concerns of individuals during a time of uncertainty. Additionally, the length of the study/recall tests and the dynamic change from physically going to the lab to entirely online may have led to further forgetfulness of participation or increased distraction during the study. Thus, many participants did not complete the study or incorrectly uploaded photographs and descriptions to Instagram and Facebook. Based on the attention checks and lure results in Study 1, it is possible that participants did not pay attention during the final recognition and recall test. As a result, there is a lingering concern of a selection bias on the part of the participants who completed the study (since demographic information was recorded at the end of Study 1 and was not saved for those who did not complete Study 2, we cannot provide formal analyses to inform these differences). Future studies should consider other participation incentives and shorter durations to ensure participants stay motivated and interested or collect demographics at the beginning of the study to examine possible differences in those who did and did not complete the studies.

Second, although we had data on the number of 'likes' and comments participants received on each Instagram and Facebook post, we did not examine whether they moderated our results (but see Sherman et al., 2016). We did not examine their impact for two reasons: (1) the number of 'likes' and comments were minimal, and (2) we did not have data on how many Instagram and Facebook friends each participant had, which made it difficult to ascertain whether a particular number of 'likes' or comments was meaningful from one participant to another. Additionally, we conflated the amount of 'likes' and comments participants received with frequency of usage (at least for Study 2) and rehearsal but have no way of knowing if they were indeed avid social media users. Future studies should consider measuring if there is a connection between social endorsement, subjective and objective usage frequency, and enhanced recall. Relatedly, the present set of studies solely recruited American participants. Future cross-cultural research is needed to examine whether these methodological issues and results extrapolate to other nations/cultures, especially with factors such as social endorsement or social media laws.

Third, the heart of our study examined how social media itself shapes how individuals remember the past. However, our results may not have anything to do with social media. It is possible that simply being re-exposed to the shared photographs and details drove our results. Relatedly, we did not have control conditions for each study. Study 1 had participants post photos and descriptions but did not include controls of just posting photos or details. Study 2 had participants post photos but did not include controls of just looking at the photos (as mentioned above) or only posting the details. Future studies should include

relative control conditions to see if having text and photos acts as an 'anchor' for retrieval alone or should include another condition whereby individuals are selectively re-exposed to the photographs but do not share them on social media to better ascertain the extent to which our results are due to sharing photographs on social media or merely being re-exposed to the photographs (Stone and Wang, 2019; Grange and Lian, 2022).

Fourth, the photographs shared via Instagram and Facebook were randomly selected by the researchers, not the participants. Additionally, the photographs did not include any photographs of the participants or their friends. This was done to solely measure the mnemonic consequences of social media use and control for any self-selection bias or visual cues that may enhance recall above and beyond just the act of sharing to social media. However, this also decreased our ecological validity since people often, but not always, share photographs that include some reference to their personal life (e.g., themselves, friends, etc.) and, naturally, self-select the photographs shared (Wang et al., 2017). Future research should include sharing personal, self-selected photos that might have included more personal details to get at a more ecologically valid methodology.

Lastly, in favour of this more specific recall separating captured versus uncaptured details in photographs of experiences, we may not be able to ascertain if the details that were captured were remembered better because they were captured in the photograph or because they were 'central' to the experience, which might be driving the results. Since the photos were only a snapshot of an experience, we cannot truly know if the elements mentioned in the diary were captured because they were central to the scene or were central to the scene but uncaptured in the photo. We tried to combat this by including questions in the diary to allow participants to explain why they took that photograph or to add any more details regarding the scene; however, of the few participants who did answer these questions, they did not include meaningful information. Future studies should consider asking detailed questions about the centrality of the scenes or include more free recall questions to get at the whole 'picture' of one's memories of their experiences from shared photographs and events.

Conclusion

Overall, the results from the present studies suggest that sharing photographs on social media enhances recall of photograph-related details and photograph recognition (Study 1) as well as enhances memory consistency of captured details (Study 2) above and beyond any mnemonic consequences associated with simply taking a photograph. The present attempt to conduct research with social media highlights the struggle between controlled settings to better explain cause and effect and real-world experiences to better understand ecological uses. These results add to the growing social media literature and demonstrate that the selective nature of sharing (or not) personal information via social media may have important implications for how individuals remember or forget aspects from their personal past.

Supplementary material. The supplementary material for this article can be found at http://doi.org/10.1017/mem.2025.3.

Data availability statement. The data that support the findings of these study are openly available in OSF at [https://osf.io/egzwq/] for study 1, and [https://osf.io/byv6f/] for study 2.

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Competing interest. Angelina N. Vasquez, Shayla J. Dockery, Jessica M. Karanian, Qi Wang & Charles B. Stone declare none.

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