Does Taking Photographs Impair Your Memory?

The Role of Attentional Disengagement

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Abstract

The photo-taking-impairment effect refers to the detrimental impact photo taking has on one's memory for the photographed object. We explored the role of two mechanisms that have been said to underlie the effect, namely offloading and attentional disengagement. In this online study 107 undergraduate students were shown 3x5 paintings and were instructed to simply observe them, take a picture that would be available for later usage, or take a picture and delete it. Afterwards, they were presented with a visual details multiple-choice test. It was expected that if attentional disengagement was the mechanism underlying the photo-taking-impairment effect, then the effect would not be present in the current study. This expectation was due to the non-distracting nature of the photo taking task that was used in the study. The results were in line with the expectations and did not indicate the presence of the photo-taking-impairment effect. Consequentially, it supported the hypothesis that attentional disengagement, rather than offloading, is the mechanism underlying this effect.

Keywords: photo-taking-impairment; offloading hypothesis; attentional disengagement hypothesis.

Introduction

The ubiquity of social media usage can hardly be denied. Picture posting is a popular activity on social media. More than 240,000 photos are for instance being uploaded on Facebook every minute (Statista Research Department, 2021). These impressive numbers might make one wonder if there is some kind of personal incentive for photo taking and photo sharing, for it to be this frequent. This might indeed be the case. Taking photos seems to have a beneficial effect on one's mental state. For instance, it has been observed that taking photos can improve one's mood (Chen et al., 2016; Kurtz, 2015). In addition, people who take more photos during their holidays report higher levels of positive emotions as well as higher life satisfaction (Gillet et al., 2013; see also Lee et al., 2020). Moreover, taking photos enhances one's enjoyment of a positive experience (Diehl et al., 2016; see also Diehl & Zauberman, 2022). A natural question to ask is whether photo taking also affects our memory for the events or objects that we photograph.

Henkel (2014) was the first to examine the relationship between photo taking and memory. Henkel's study involved students going to a museum and observing some paintings, while photographing others. Afterwards, they were tested on the paintings' details. Interestingly, participants performed worse on the memory test for the paintings they photographed than for the paintings they simply observed. This phenomenon was named the photo-taking-impairment effect. Since then, it has been replicated multiple times (e.g., Niforatos et al. 2017; Tamir et al., 2018; but see Barasch et al., 2017, for the opposite finding).

Soares and Storm (2018) created a laboratory version of Henkel's (2014) study that allows the photo-taking-impairment effect to be studied under controlled conditions. It employs a within-subjects design that has participants either observe or photograph paintings that are displayed on a computer screen and afterwards subjects them to a multiple-choice test to assess their memory of the paintings' visual details. Participants are led to believe they will have access to their photographs during the test, but right before its start, they are told that they will have to complete the visual details test without them. The photo-taking-impairment effect reliably presents under these circumstances (e.g., Lurie & Westerman, 2021; Soares & Storm, 2018, 2022). The paradigm also allows for the underlying mechanism(s) of the effect to be carefully investigated. Soares and Storm (2018) proposed two possible mechanisms underlying the photo-taking-impairment effect: the offloading and the attentional disengagement hypotheses.

Offloading refers to a person's reliance on an external environment to reduce cognitive demands (Hu et al., 2019). In the current context, it refers to the idea that to reduce the cognitive load experienced by a vast amount of visual information, people rely on their (smartphone) camera to remember the photographed objects for them. However, this in turn decreases the likelihood of recall of the photographed objects because they are saved in the prosthetic memory of the camera instead of the organic memory of the person taking the picture (Soares & Storm, 2018; Storm & Stone, 2014). Therefore, the offloading hypothesis predicts that participants' memory for the objects that they photograph will be more negatively impacted compared to their memory for the objects that they merely observe. However, it also predicts that deleting the photograph after it was taken would not have such a negative impact on memory because then participants cannot rely on their phone's prosthetic memory to remember for them. To test these predictions, Soares and Storm (2018) carried out two experiments.

Experiment 1 involved three conditions (Observe vs Camera vs Snapchat). The first two conditions, namely Camera and Observe, were meant to test the photo-taking-impairment effect, whereas the third, the Snapchat condition, was included to test the offloading hypothesis. In the Observe condition participants simply observed paintings for 15 seconds each, whereas in the Camera condition participants took a picture of the paintings with a mobile phone and then continued to observe each painting for what remained of 15s. In the Snapchat condition participants used the Snapchat application to take photos of the paintings and send them to a contact person in that app. In this condition too they were allowed to observe each painting for what remained of 15s after these actions. Snapchat is a popular social media app which is designed for picture and video taking and exchange (Vaterlaus et al., 2016). However, in contrast to other social media apps, media sent via Snapchat is only available for a limited amount of time. The receiver can view a picture or a video once and then it becomes permanently inaccessible. The sender no longer has access to the picture or video once they sent it. The Snapchat condition thus allows participants to understand that the photos they take will not be accessible to them in the future. Therefore, if the offloading hypothesis is true, and people remember photographed objects worse after taking pictures solely because they believe they will have access to them later, the Snapchat condition should yield similar results to the Observe condition. This is the case because after taking pictures via Snapchat, participants cannot gain access to them in the future, and thus, should not expect to be able to offload the memory of the photographed object onto the phone. This is what Soares and Storm (2018) expected to find in their first experiment. However, while they successfully replicated the photo-taking-impairment effect, the offloading hypothesis was not supported by the evidence. Specifically, the photo-taking-impairment effect was observed through participants' significantly better performance on the visual details test in the Observe condition compared to the Camera condition. The offloading hypothesis was <u>not</u> supported because performance in the Observe condition was also significantly better than in the Snapchat condition. Interestingly, performance in the Snapchat condition was even significantly worse than in the Camera condition.

Soares and Storm (2018) considered that the inaccessibility of photos after they are taken might not have been sufficiently obvious in the Snapchat condition and therefore introduced the Delete condition instead of the Snapchat condition in their second experiment. In the Delete condition participants took a photo of a painting and then immediately deleted it. Soares and Storm also equated the viewing times in the different conditions by allowing participants in the Camera and Delete conditions to observe each painting for another 15 seconds once they finished photographing it. Despite these changes, the results of Experiment 1 were replicated in Experiment 2. The photo-taking-impairment effect was once more found. However, participants' performance in the Observe condition was significantly better compared to the performance in the Camera as well as the Delete condition. Because the offloading hypothesis predicts that memory of the photographed object is offloaded onto the camera, taking a picture and immediately deleting it, as was done in the Delete condition, should have prevented participants from offloading. This in turn should have resulted in significantly better recall of paintings encountered in the Delete compared to the Camera condition. However, this was not the case. Therefore, Soares and Storm's second experiment also failed to support the offloading hypothesis.

Soares and Storm (2018) introduced an alternative explanation to account for their findings: the attentional disengagement hypothesis, which refers to the shift of one's attention away from a certain stimulus (Wirz & Schwabe, 2020). This hypothesis is built on the idea that people have limited attentional capacity and when there are multiple competing sources of information, a person prioritizes its allocation (Chun & Turk-Browne, 2007; Sears et al., 2010). In the context of the photo-taking-impairment effect, attentional disengagement relates to the process of redirecting one's attention from the stimulus to one's (smartphone) camera to take a picture. This shift is required because a person cannot at the same time focus on the observation of the stimulus and the action of taking a photograph (Wang & Tchernev, 2012). Such an attention shift from stimulus to device could potentially explain why in Soares and Storm (2018) participants remembered the details of paintings worse when they had to photograph them, regardless of whether they believed these photographs would later be available or not. Their attention would have been focused on the camera in the Camera conditions, and on picture taking and sending or deleting the photographs in the Snapchat condition of Experiment 1 and the Delete condition of Experiment 2, respectively. This would disengage them from the observation of the paintings, presumably even more in the Snapchat and Delete conditions than in the Camera conditions, because the former actions are more involved (see Niforatos et al., 2017, for a related argument). The attentional disengagement hypothesis thus also explains why participants' performance on the visual details multiple-choice test was worse in the Snapchat condition than in the Camera condition of Experiment 1.[1] Note that the presence of the photo-taking-impairment effect, despite the fact that viewing time was equated in Experiment 2, indicates that it is not merely due to participants being distracted while photo taking. It suggests that photo taking even distorts the encoding of the stimuli once the camera has been put down.

The present study aimed to further investigate the mechanisms underlying the photo-taking-impairment effect through a follow-up of Experiment 2 in Soares and Storm (2018). We hypothesized that if attentional disengagement is responsible for the effect, then there should be no significant difference between the Observe condition on the one hand and the Camera and Delete conditions on the other if the photo taking is made to require minimal attention. Specifically, it was expected that if photo taking would occur through a simple button press, it would require less attention than the handling of a physical camera, which in turn would minimize the photo-taking-impairment effect. In a way, this manipulation constitutes the opposite of that in Soares and Storm (2018) where complicating the photo taking process was found to increase the photo-taking-impairment effect in their Experiment 1. Here we contend that simplifying this process should reduce the effect if attentional disengagement is responsible for it. That is, if the photo-taking-impairment effect could be eliminated by minimizing the attentional burden imposed by the act of photo taking, this would further support the attentional disengagement hypothesis.

Method

The experiment was pre-registered (https://osf.io/s8vmy). It employed the materials and procedure of Experiment 2 from Soares and Storm (2018) with the exception that it was conducted online, included a different filler task, and had participants click an icon on their screen to take a photograph of the paintings instead of using a physical camera.

Participants

An a priori power analysis indicated that a total of 104 participants was needed to detect the photo-taking-impairment effect with a power of .90 and an α of .05. The sample size was determined using G*power (Faul et al., 2007) with a d_z = .32 obtained by Soares and Storm (2018) when comparing the Camera and Observe conditions in their Experiment 2 using a two-tailed paired sample t-test.

A total of 233 undergraduate students at Erasmus University Rotterdam participated voluntarily or for partial course credit. After the pre-registered exclusion criteria were applied, a total of 126 participants were excluded from the analysis. Specifically, 38 participants did not finish the study completely, 29 participants took the study on a phone instead of a computer, 18 participants indicated having a visual impairment, 15 participants indicated having been diagnosed with a neurological disorder that might affect their memory performance, 7 participants incorrectly answered the question regarding which icon corresponds to which photo taking action, 6 participants indicated having an English language reading proficiency lower than CEFR level B2, 7 participants reported having knowledge about the photo-taking-impairment effect, 5 participants indicated having an arts related degree, and 1 participant was consider to be an outlier following the 1.5 x IQR rule. The final sample included a total of N = 107 participants (n = 86 female, n = 19 male, n = 2 non-binary), which just exceeds the targeted N of 104. The participants' age ranged from 18 to 36 years (M = 21.10, SD = 2.73).

Materials

The experiment was conducted online through the April 2022 version of Qualtrics (Qualtrics, Provo, UT) and took approximately 30 minutes to complete. As it used visual stimuli that had to be seen in their entirety and had to be large enough to notice certain visual details, participants were required to take the experiment on a computer or a tablet.

The experiment included images of 15 figurative paintings by artists such as André Derain, Claude Monet, Henri Matisse, and others. Although these artists are known, the paintings themselves were unknown to most of our participants. The images' size was set to 65% of the screen size. The images were thus adapted to every participant's device such that each participant saw the whole painting without having to scroll down or to the side. The title of the painting and the name of the artist were displayed above each painting in a black font (28-point text, font: Qualtrics Default, title: italics).

A visual details multiple-choice test including 30 questions was administered at the end of the experiment. The questions related to the paintings participants were shown earlier in the experiment. They inquired about different details of the paintings presented earlier and referred to the painting title and name of the artist. For example: "How many houses are visible in The Poppy Field by Claude Monet?" The correct answer (one) and three other alternative answers (none, two, three) were presented below the question. There were two questions per painting, which were always presented together.

Design

The experiment used a within-subjects design with three conditions: Observe, Camera, and Delete. In the Observe condition, participants were presented with five images of different paintings and were asked to look at them for 15 seconds. After the time was up, the screen auto-advanced to a new painting and participants had to observe this new

[1] Soares and Storm (2018) did not find a significant difference between the Delete and the Camera condition in Experiment 2.

painting for 15 seconds. In the Camera condition participants were also presented with five images of paintings but they were asked to first take a screen capture of the painting by clicking on an icon of a camera with save indication below the painting. This icon can be found on the left in Figure 1. The participants were informed that by pressing the camera button both the painting as well as the title of the painting and the name of the artist would be saved, and that they would have access to these saved screen captures in the final test. However, because this study targeted memory of participants regarding the objects they were presented with, the participants did not actually gain access to the screen captures during the final test. It was necessary to deceive the participants about this to test the offloading hypothesis of the photo-taking-impairment effect. If under these attentionally undemanding photo taking conditions, participants' memory for the paintings would nevertheless be impaired compared to the Observe condition, this would constitute strong evidence for the offloading hypothesis. In the Delete condition, similar to the Camera condition, participants were also presented with five paintings and had to press a camera icon. However, in this condition the camera icon was accompanied by a delete indication, and participants were informed that after pressing this icon a screen capture would be taken, but that it would not be accessible during the final visual details test. The icon can be seen on the right in Figure 1.

Figure 1: Icons used to represent the Camera condition (left) and the Delete condition (right)

The 15 paintings were organized into three different blocks with five paintings each. The order of the blocks and the paintings was the same for all participants, but the condition-specific instructions that preceded a block were counterbalanced using a Latin square.

Procedure

To start the experiment, participants provided informed consent. They were then informed in more detail about the procedure, namely that they would be presented with paintings and in certain cases could photograph them for future use, while in other cases they would only observe or photograph the paintings without saving them (meaning they wouldn't have access to them in the future). Participants were informed at the onset of the experiment that their memory of all paintings (regardless of the action taken) would be tested using a visual details multiple-choice test.

After these initial instructions, participants were presented with a control item which tested if they read and understood the instructions carefully. Specifically, this question asked them to identify which of the icons from Figure 1 (left or right) was responsible for taking a picture but not storing it for future use. Incorrect answers to this question were later used to identify and exclude the data of participants who did not pay attention and/or misunderstood the instructions. After answering this question, participants were presented with a practice item in which they observed a painting and answered a multiple-choice question about it. This aimed to familiarize them with the procedure and to make them aware of the (nature of the) visual details test that would be presented later.

After finishing the practice trial, participants entered the study phase in which they were presented with the 15 paintings. Before every condition, participants were presented with the instructions that explained exactly what they had to do. Depending on the condition, the paintings were presented with either a camera + save icon, a camera + delete icon, or nothing below it. If there was an icon below the painting, participants had to first press that icon and then press an arrow at the bottom of the page to proceed. After pressing the arrow, participants were presented with an identical image which they had to observe for 15 seconds. This step equated the painting viewing time across conditions. In the Observe condition, no icons had to be pressed. All paintings were simply presented for 15 seconds and auto advanced to the next painting after the time was up.

After finishing the study phase, participants were presented with an unrelated filler task in which they assessed the strength of 40 similarity-based inferences about animals. Specifically, participants were asked to indicate how likely they thought it was that a certain animal possessed a specific feature given that two other animals possessed that same exact feature (see Douven et al., 2023, for examples and treatment).

When participants finished the filler task, they were presented with the visual details multiple-choice test (i.e., the test phase). This test consisted of 15 pairs of questions, which were presented in a random order. Participants had 10 minutes to answer all test questions. After finishing the test or after 10 minutes (whichever came first), participants provided demographic information, indicated whether they had encountered any of the paintings prior to the experiment, and were debriefed. During the debriefing, specific attention was paid to the reasons for the deception participants experienced (i.e., the Camera condition instructions which had participants mistakenly believe that the camera button would save the painting and that they would gain access to the saved pictures during the final test).

Results

The statistical analyses were carried out using IBM SPSS Statistics 25. An α of .05 was used throughout the pre-registered and exploratory analyses. Correct answers on the visual details multiple-choice test were scored as 1 and incorrect answers were scored as 0. There were two questions for each of the five paintings in each of the three conditions, meaning the participants could score a maximum of 10 in each of the three conditions. A preliminary analysis indicated that participants scored overall above the chance level of 25% (for multiple-choice questions with four alternatives). A pre-registered repeated-measures ANOVA was run to investigate differences in test performance between the three conditions. As shown in Figure 2, the ANOVA revealed no significant differences between the Observe, Camera, and Delete conditions, $F(2, 212) = .112$, $p = .894$, $\eta^2_p = .002$. We then investigated differences between the conditions using post-hoc analyses with Bonferroni adjusted α. We did not find a photo-taking-impairment effect. There was no difference in correctly answered questions between the Observe ($M = 5.70$, $SD = 2.04$) and Camera ($M = 5.79$, $SD = 1.92$) condition, $p = 1.000$. There was no support for the cognitive offloading hypothesis either as the difference in correctly answered questions between the Camera ($M = 5.79$, $SD = 1.92$) and Delete ($M = 5.79$, $SD = 2.10$) condition was not significant, $p = 1.000$. There was also no difference between the Observe ($M = 5.70$, $SD = 2.04$) and Delete ($M = 5.79$, $SD = 2.10$) condition, $p = 1.000$. These results are consistent with our hypothesis and in line with the attentional disengagement account in that making photograph taking attentionally undemanding appears to eliminate the photo-taking-impairment effect.

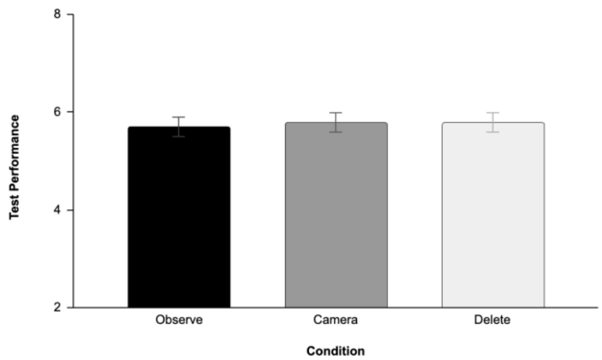

Figure 2: Mean performance on the visual details multiple-choice test as a function of condition (error bars show standard error of the mean)

To establish the robustness of the above findings, it was decided to run several exploratory follow-up analyses. First, a repeated-measures ANOVA was performed on the data without any exclusions, except cases where no data was available. With a sample size of $N = 161$, no significant differences were found between the three conditions, $F(2, 320) = .704$, $p = .495$, $\eta^2_p = .004$. Second, a separate repeated measures ANOVA was run for each of the three different orders of conditions ($N_A = 36$, $N_B = 40$, $N_C = 31$) to see if this order had an effect on the results. A repeated-measures ANOVA conducted on order A (Delete; Camera; Observe) revealed a significant main effect of condition, $F(2, 70) = 6.36$, $p = .003$, $\eta^2_p = .154$. Post-hoc analyses with Bonferroni adjusted α indicated that there was a significant difference between the Observe ($M = 5.11$, $SD = 2.16$) and the Delete ($M = 6.33$, $SD = 1.82$) conditions, $p = .003$. No other differences were significant in order A. Order B (Camera; Observe; Delete) revealed no significant main effect of condition, $F(2, 78) = 1.74$, $p = .177$, $\eta^2_p = .043$. Similarly, order C (Observe; Delete; Camera) also revealed no significant main effect of condition, $F(2, 60) = 1.53$, $p = .225$, $\eta^2_p = .049$. Third, a little less than half of the participants ($N = 52$) recognized at least one painting in the study. A repeated-measures ANOVA with participants who did not recognize any of the 15 paintings ($N = 55$) revealed no significant main effect of condition, $F(2, 108) = .281$, $p = .756$, $\eta^2_p = .005$.

In conclusion, the null result persisted in a larger and more heterogenous sample. Neither of the condition orders revealed a photo-taking-impairment effect, although a photo-taking-benefit was found in order A when the photo was said to be deleted afterwards. Finally, when the analysis was conducted on the data of participants who did not recognize any of the paintings, still no effect of photo taking was found. Together, these analyses show that when photo taking is made attentionally undemanding, the photo-taking-impairment effect is consistently absent across various samples and manipulation orders.

Discussion

The present experiment pertained the mechanisms underlying the photo-taking-impairment effect (Henkel, 2014; Lurie & Westerman, 2021; Soares & Storm, 2018, 2022; Tamir et al., 2018), specifically the role of offloading and attentional disengagement therein. In contrast to earlier studies, participants in this experiment took photographs using a simple button press instead of using an actual (smartphone) camera. This change allowed for the minimization of distractions during photo taking, which, in turn, resulted in the elimination of the photo-taking-impairment effect. Whereas participants in Soares and Storm (2018) recalled significantly fewer details of paintings they photographed than of paintings they simply observed, participants in our experiment did not show such a recall difference, while the only major difference between the experiments comprised the way photos were taken (using a camera phone vs button press, respectively). It thus seems that photo taking has a detrimental effect on the memory for the photographed object only if the process of taking a photograph is distracting. However, if the process is not distracting, one's memory is not negatively impacted. Because minimizing the distractions during the process of photographing an object appears to eliminate the photo-taking-impairment effect, it seems warranted to propose that the mechanism underlying the photo-taking-impairment effect is attentional disengagement rather than offloading. This conclusion is supported by the lack of significant differences between the Camera and Observe, as well as Camera and Delete conditions in our experiment.

The results of the present experiment are in line with those by Niforatos et al. (2017) who aimed to investigate the impact of non-physical camera interaction on the photo-taking-impairment effect. They compared recall scores for visual details encountered during a campus tour among participants in an active Camera condition (who manually took either an unlimited number or a fixed number of pictures with their smartphones) and a passive Camera condition (in which participants were equipped with a camera automatically capturing pictures of the campus tour). Participants in all photo conditions (active and passive) were told that pictures would be available during the final memory test but were informed just prior to the test that they wouldn't. A mere Observe condition was also included for comparison. Participants only showed impaired recall for objects after actively taking pictures but not when picture taking was automated (passive Camera condition). The latter result is comparable to the elimination of the photo-taking-impairment effect we observed when the photo taking process was reduced to a simple button press. Like us, Niforatos et al. (2017) concluded that being distracted by manually operating a camera underlies the photo-taking-impairment effect.

While finding no significant difference in recall between the three conditions of our experiment is in line with our predictions based on the attentional disengagement hypothesis, one of course needs to be careful to draw overly strong conclusions based on a null result and entertain the possibility that it actually constitutes a type II error, despite the fact that we set up the experiment to have a power of .90 to establish the photo-taking-impairment effect.[2] Our experiment did not include a conventional photo taking condition that could help ensure that no other element of the design is responsible for the absence of the oft replicated photo-taking-impairment effect. It is also important to recognize the other limitations of the present experiment.

First, the experiment was conducted online and not in the laboratory. Because of this there was no experimenter present to ensure that participants were engaging with the task and conforming to the rules of the experiment (e.g., not using the internet for answers during the visual details test). While we recognize that this is a limitation, some of the potential effects of participants completing the experiment in uncontrolled circumstances should have been alleviated by the within-subjects nature of the experiment. It is also insightful to find that the recall performance of participants in our experiment was comparable to participants' performance in the Observe conditions in Soares and Storm (2018). Their performance was also well above chance, yet far from perfect, with participants getting just under 6 out of 10 visual detail multiple-choice questions with 4 answer alternatives right per condition. Our null result thus does not seem to reflect a floor or ceiling effect.

Second, to reduce attentional disengagement, participants in our experiment took pictures by pressing a button on the screen instead of using an actual camera. The action of pressing a button might not have been convincing enough for people to believe that they would have the paintings available during the final test. If participants did not believe the cover story, they might have treated each condition as an Observe condition.

Third, conducting the experiment online, explicitly instructing the participants to remember information for a later test, and not featuring physical camera interaction can be criticized as limiting the ecological validity. One could argue that the study design does not resemble everyday camera usage. While this is true, taking screen captures and taking pictures of lecture slides are not uncommon either. It is a strategy used by many students, like the ones in our sample, to save lecture content in online or physical classroom settings (Ditta et al., 2023). Interestingly, under these circumstances a photo-taking-benefit has been shown. Ditta et al. (2023) showed that students had better memory for the content of slides they photographed than of slides they did not photograph, whereas Barasch et al. (2017) found that participants who took photographs during a virtual museum tour remembered more visual information than participants who did not. Notably, both studies were conducted online and in Barasch et al. participants took photos using a button press. This leads us to expect that the motivations behind photo taking warrant further investigation. Both in Ditta et al. and Barasch et al. participants were free to choose what to photograph, which might have prompted participants to photograph that what they found to be salient/interesting/important, which could explain why they also remembered it better, although it needs to be acknowledged that Ditta et al. also found the photo-taking-benefit when participants were told what to photograph.

Keeping these limitations in mind, a natural follow-up to the current experiment would be one in which the attentional demands of photo taking are increased rather than minimized, for instance by having participants use a professional camera as opposed to a smartphone camera or by having them use a professional photo taking app instead of their regular photo taking application. According to the attentional disengagement hypothesis, the increased attentional demand that this manipulation imposes should increase the photo-taking-impairment effect in the more difficult photo taking circumstances (i.e., professional camera or app). Evidence for the attentional disengagement account would then be based on significant differences between conditions rather than on a null finding. It would also be recommended to conduct such an experiment in the lab under the supervision of an experimenter who could ensure participants follow the instructions and potentially volitional photo taking could be included as well.

To conclude, the current experiment did not find the photo-taking-impairment effect that was reported in previous literature. Whether participants observed or photographed paintings, and whether they believed they would or would not have access to their photographs, did not affect participants' performance in the final visual details test. These findings are in line with the attentional disengagement hypothesis in that the photo taking was made so attentionally undemanding it would not require participants to shift their attention from the photographed object to the action of photo taking.

[2] For comparison, our study involved 107 participants, while Soares and Storm (2018) included 42 (Experiment 1) and 41 (Experiment 2) participants.

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SV conceptualized the study. SB, RV, and SV collected the data. SB and MC independently analyzed the data. The paper is based on the bachelor thesis by RV and the master thesis by MC. SB and SV provided critical revisions. All authors discussed the findings thoroughly, read, and approved the final version of the manuscript. They would like to thank Julia Soares for providing the necessary materials and Muhammet Sahan for feedback on an earlier draft.

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