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REINFORCED SELF-AFFIRMATION AND REINFORCED FAILURE REDUCE SUSCEPTIBILITY TO MISINFORMATION

The main aim of the present study was to investigate the influence of reinforced self-affirmation and reinforced failure on the memory misinformation effect. The misinformation effect consists in the witness including some incorrect details into their testimony, stemming from sources other than the original event. In the reinforced self-affirmation procedure, participants first recall their greatest achievements in life and are afterwards given a memory task with positive feedback about their performance on it. In a series of previous experiments, reinforced self-affirmation proved to reduce vulnerability to misinformation. The same result was obtained in the present study. Reinforced failure is a procedure not studied before, consisting in the participants recalling their greatest failures in life, connected with negative feedback about performance on a memory task. It was hypothesized that reinforced failure would increase vulnerability to misinformation. The results pointed to the opposite tendency – participants in the reinforced failure group performed better than those in the misled control group. The reduction in susceptibility to misinformation was greater in the reinforced self-affirmation group than in the reinforced failure one. The results are discussed in terms of the possibility of constructing a method of immunizing people to the misinformation effect available in practice for a wide community of professionals dealing with interrogations.

Keywords: misinformation effect, reinforced self-affirmation, reinforced failure, eyewitness testimony, memory.

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INTRODUCTION

The misinformation effect consists in the witness including information in their testimony that is inconsistent with a given event and stems from sources different from this event (Polczyk, 2007). Research into the misinformation effect usually involves some sort of a three-stage paradigm (Loftus, Miller, & Burns, 1978; Pezdek, 1977). In the first stage, the participants are presented with some original material; for example, they watch a video clip (Cohen & Harnick, 1980) or a series of slides (Loftus et al., 1978), listen to an audio recording (Szpitalak & Polczyk, 2010), or read a text (Hertel, Cosden, & Johnson, 1980). In the second phase, the participants are presented with some post-event material relating to the original event, which includes some misleading details about it in the experimental group. The post-event material may take the form of a narrative describing the original event (e.g., Zaragoza & Lane, 1994), questions with false presuppositions (e.g., Loftus et al., 1978), an audio recording (Blank, 1998), a video clip (Itsukushima, Nishi, Maruyama, & Takahashi, 2006), or a conversation with other witnesses (Memon & Wright, 1999). The last stage consists in a memory test concerning the original material. Typically, the number of incorrect answers consistent with misinformation on the final memory test is higher in the misled experimental group compared with the control one.

The main research areas concerning the misinformation effect relate to its mechanisms (e.g., Blank, 1998; McCloskey & Zaragoza, 1985; Lindsay & Johnson, 1989; Polczyk, 2007; Szpitalak & Polczyk, 2011), the correlates of the tendency to yield to misinformation (reviews: Polczyk, 2007; Wright & Loftus, 1998) and the methods of reducing the tendency of witnesses to rely on misinformation (McCloskey & Zaragoza, 2001; Greene, Flynn, & Loftus, 1982; Echterhoff, Hirst & Hussy, 2005; Wright, 1993). The experiment presented in this article relates to the last of these areas. A procedure is presented which may be a basis for constructing methods reducing the influence of misinformation on witness testimony. So far, few such methods have been proposed. They include: warning against misinformation (which was not always effective; see Chambers & Zaragoza, 2001; Greene, Flynn, & Loftus, 1982; Neuschatz, Payne, Lampinen, & Toglia, 2001; Zaragoza & Lane, 1994); using the cognitive interview (also with inconsistent results; Holliday & Albon, 2004; Memon, Meissner, & Fraser, 2010), or collaborative recall (Karns, Irvin, Suranic, & Rivardo, 2009; Ross, Spencer, Blatz, & Restorick, 2008). Given the scarcity of methods available for immunizing witnesses against misinformation and the great importance of the misinformation effect in real forensic situations, research concerning the

question of how to make people less vulnerable to misinformation seems very important. This is the question the present study deals with.

Reinforced Self-Affirmation

As a result of a series of studies by Szpitalak (2012) and Szpitalak and Polczyk (2012c), a method possibly protecting against misinformation was developed, called reinforced self-affirmation. It consists in giving an opportunity to self-affirm coupled with boosting the person's self-esteem. Self-affirmation consisted in the participant writing down their greatest achievements in life. Enhancing self-esteem consisted in the participant performing a short memory task and being given false positive feedback about the results on this task. Thus, the positive self-image activated by recalling great achievements was "objectively" confirmed by positive feedback from an "independent" source. The main premise for such a procedure was the assumption that elevated self-esteem would result in a tendency to rely on one's own judgments and memories, not on information from external sources. As a result of this, enhanced self-esteem should result in less tendency to give in to external influence, including the influence of misinformation. In a series of experiments this procedure indeed proved to reduce vulnerability to various forms of social influence; this effect was called *the effect of reinforced self-affirmation* (RSA); its efficacy was proven in seven experiments concerning the misinformation effect (Szpitalak, 2012; Szpitalak & Polczyk, 2012a; Szpitalak & Polczyk, 2012c), in one study into attitude change (Szpitalak & Polczyk, in press), and in one experiment concerning the door-in-the-face technique (Szpitalak, Polczyk, & Cyganiewicz, under review).

Reinforced Failure

The main reason for doing research concerning RSA is the need for a procedure useful for minimizing the tendency of witnesses to give testimonies distorted as a result of misinformation. The question may arise of what is the reason for researching reinforced failure. Reinforced failure would take place if the self-esteem of the witness were reduced by negative feedback coupled with the activation of a negative self-image. It is possible that such a situation may take place in a real forensic context, at least in two circumstances. First, it may happen that after being a witness to a crime a person may feel "bad," for example because they did not help the victim. At the same time, the person may have

a negative opinion about the quality of their memory. The combination of these two elements is not far from reinforced failure.

Second, some form of reinforced failure may take place on the witness stand. It is easy to imagine that the quality of a witness's memory is being discredited, e.g., by lawyers, while also external "evidence" confirming the "poor quality" of the witness exists, e.g., in the form of better testimony of other witnesses. In all such situations, the questions arise of whether and to what extent the lowered self-esteem could make the witness more vulnerable to misinformation.

Negative feedback, but without the lowering of self-esteem was researched by Szpitalak (2012) as well as Szpitalak and Polczyk (2012b). Before reading the post-event material, participants were engaged in a short memory task and were given negative feedback about their performance. It was assumed that the negative feedback would cause a threat to positive self-image (Moskowitz, 2009; Sedikides & Green, 2000). It was also assumed that, in order to protect their positive self-image, participants would engage intensively in the next part of the experiment in order to obtain good results and to restore the positive self-image in this way (Cianci, Klein, & Seijts, 2010). As this next part of the experiment involved post-event material, engaging in it should result in the better encoding of the material, including better encoding of misinformation. As a final result, negative feedback should lead to greater susceptibility to misinformation. This hypothesis was confirmed in the research by Szpitalak and Polczyk (2012b), but not in that by Szpitalak (2012). The meta-analysis of these results yielded a very small, barely significant effect in the expected direction.

This inconsistency may have been caused by the relatively weak impact of negative feedback. The feedback may have been too weak to impact some participants, for example those with high self-esteem (Kernis, 2003), and not strong enough to make them engage intensively in processing the post-event material. Also, it is worth noting that in the experiments by Szpitalak (2012) and Szpitalak and Polczyk (2012a) positive feedback alone did not produce any significant effect; it only did so in combination with self-affirmation. It is possible that the same is the case with negative feedback – perhaps it is to weak alone, but may become efficient in combination with some other factors. Verifying this assumption was one of the aims of the present research.

Apart from concentration on the post-event material, the second reason for higher susceptibility to misinformation may be lowered self-esteem resulting from negative feedback. This may be so because lower self-esteem may make the participants subjected to the reinforced failure procedure rely on external sources rather than on their own memory. Doubting in one's memory was shown by

Blank (1998) to be one of the main reasons for yielding to misinformation in subjects who actually remembered the correct information but did not trust their own memory. Van Bergen, Horselenberg, Merckelbach, Jelicic, and Beckers (2010) also demonstrated that the participants who were not confident about their memory tended to rely on external cues – that is, on the post-event material.

HYPOTHESES

To sum up, the following hypotheses were formulated:

1. The misinformation effect will occur: the number of answers consistent with misinformation will be higher in the misled group, compared with the control one. This hypothesis was based on existing results indicating that the misinformation effect is quite a powerful and replicable phenomenon.

2. Reinforced self-affirmation effect will occur: the number of answers consistent with misinformation will be lower in the misled group in which RSA is applied than in the misled group without RSA. The main premise for this hypothesis has been described above: RSA should enhance self-esteem, which in turn should increase the tendency to rely on one's own memory, not on the post-event material, and therefore reduce vulnerability to the misinformation included in that material.

3. Reinforced failure will result in a greater misinformation effect: The number of answers consistent with misinformation will be greater in the misled group in which the reinforced failure procedure is applied than in the misled group not subjected to this procedure. This was expected on the basis of the assumption that reinforced failure would lower self-esteem and would therefore increase the tendency to rely on external sources – in this case, on post-event material containing misinformation.

METHOD

Participants

One hundred and sixty-two participants (99 women and 63 men), students of high schools in Cracow, took part in the experiment. Their mean age was 17.19 (SD = 1.00). The experiment was performed during school classes. The students were asked if they were willing to take part in a study concerning the influence

of an audio recording on the quality of information processing. No financial gratification was given for participation.

Materials

The following materials were used in the experiment:

Materials concerning the misinformation effect:

1. The original material: a six-minute audio recording on a historical event (details of the burial of Pharaohs in ancient Egypt).

2. The post-event material: a narrative describing the original audio recording; in the experimental group it contained eleven details inconsistent with the original material (details changed or added).

3. A memory test, consisting of eleven critical questions relating to the items that the misleading concerned and eight filler questions.

Materials concerning reinforced self-affirmation and reinforced failure:

1. A list of 60 nouns to memorize.

2. A form for writing down the nouns remembered. In the experimental group, the form had numbered entries that allowed the participant to realize how many nouns they remembered, so that they could compare their results with the feedback provided by the experimenter. In the control group, the form did not contain numbered entries but just space for writing down the nouns remembered.

PROCEDURE

The experiment took place during school classes in high schools. The experimenter introduced herself as a scientist from the Jagiellonian University in Cracow, doing research on the influence of audio material on information processing.

At the beginning, participants were asked to listen to an audio recording about the history of ancient Egypt. Next, they were engaged in a ten-minute filler questionnaire. After ten minutes, one third of the participants were asked to describe in detail the route from their homes to school. The second third of the participants were asked to write down their greatest failures in life; the remaining third were asked to write down their greatest achievements in life. The instructions were given to participants in a written form. After three minutes, participants were asked to do a short memory task, which consisted in trying to memorize as many items as possible from a list of 60 nouns. After three minutes, the lists were taken away and the forms for writing down the nouns remembered

were distributed. After that, the experimenter gave participants feedback about the results on the memory task; depending on the condition, the feedback was positive, negative, or none at all. Positive feedback consisted in informing the participants about a "typical mean number of nouns remembered"; in the positive feedback condition, the "typical mean number" was largely underestimated (compared to the results from the pilot study), so that most participants had results above the mean number. In the negative feedback condition, the actual typical mean number was overestimated. No feedback was given in the control condition.

Next, participants were asked to read the post-event material and, finally, they were given a memory test concerning the original material. At the end, all participants were debriefed.

RESULTS

The experiment was based on a 2 (misinformation: present vs. absent) × 3 (reinforced self-affirmation vs. reinforced failure vs. control condition) design. A two-factor analysis of variance was applied to analyze the data. First, descriptive statistics regarding the mean numbers of answers consistent with misinformation were computed and presented in Table 1.

Table 1
Descriptive Statistics for the Mean Number of Answers Consistent With Misinformation Across Experimental Conditions

Factor or interaction	Level of factor		*N*	*M*	*SD*	95% *CI* – lower bound	95% *CI* – upper bound
Misinformation	present		85	12.76	2.36	12.25	13.27
	absent		77	9.64	1.65	9.26	10.01
Manipulation	reinforcement		63	10.62	1.96	10.12	11.11
	absent		42	12.40	2.78	11.54	13.27
	failure		57	11.18	2.79	10.43	11.92
Misinformation × manipulation		reinforcement	35	11.31	2.07	10.60	12.03
	present	absent	22	14.36	1.76	13.58	15.14
		failure	28	13.32	2.11	12.50	14.14
		reinforcement	28	9.75	1.43	9.20	10.30
	absent	absent	20	10.25	1.97	9.33	11.17
		failure	29	9.10	1.50	8.53	9.67

Next, a between-groups two-factor ANOVA was performed. The main effect of the misinformation was significant ($F(1, 156) = 127.17$; $p < .001$; $\eta^2 = .45$). Thus, the first hypothesis concerning the misinformation effect was confirmed. Also, the main effect of the self-affirmation and reinforced failure proved to be significant ($F(1, 156) = 11.78$; $p < .001$; $\eta^2 = .13$). The HSD post-hoc Tukey test revealed that the participants from the reinforced self-affirmation group had a lower mean number of answers consistent with misinformation than the control group ($p < .001$), but the group with reinforced self-affirmation did not differ from the group with reinforced failure ($p = .219$). The latter had a lower mean number of answers consistent with misinformation than the control group ($p < .001$).

The interaction between misinformation and self-affirmation was significant ($F(1, 156) = 9.72$; $p < .001$; $\eta^2 = .11$). It is illustrated in Figure 1.

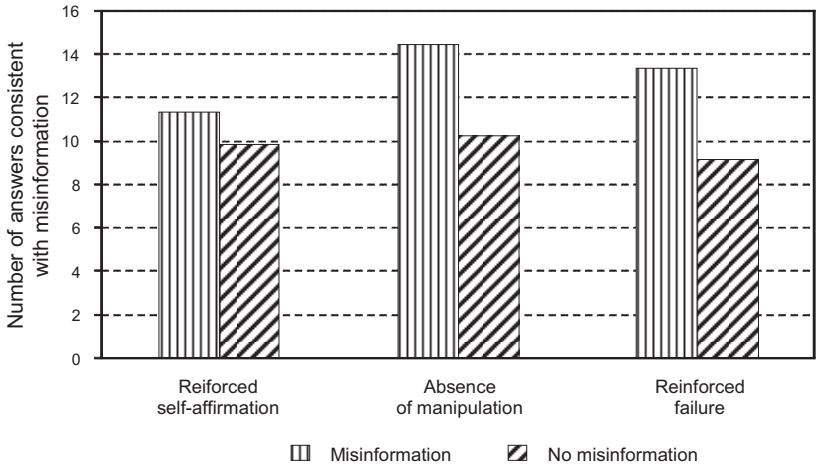

Figure 1. Mean number of answers consistent with misinformation as a function of misinformation and self-affirmation manipulations.

The planned comparisons analysis proved that in the misled group participants from the group with reinforced self-affirmation were less vulnerable to misinformation than the participants from the group with reinforced failure ($F(1, 156) = 18.71$; $p < .001$; $\eta^2 = .11$), and from the control group ($F(1, 156) = = 37.51$; $p < .001$; $\eta^2 = .19$). This last effect confirms Hypothesis 2. However, the participants from the reinforced failure group were more resistant to misinforma-

tion than those from the control group ($F(1, 156) = 4.00$; $p = .047$; $\eta^2 = .02$). This effect is the reverse of the one postulated in Hypothesis 3.

In the case of non-misled participants, no significant differences between the groups with reinforced self-affirmation and the control group were detected ($F(1, 156) = .87$; $p = .352$; $\eta^2 = .01$). Similarly, there were no significant differences between the reinforced failure and reinforced self-affirmation groups ($F(1, 156) = 1.78$; $p = .184$; $\eta^2 = .01$). The group with reinforced failure was less susceptible to misinformation than the control one ($F(1, 156) = 4.65$; $p = .033$; $\eta^2 = .03$).

Finally, the difference between the misled and non-misled groups proved to be significant in the group with reinforced self-affirmation ($F(1, 156) = 11.37$; $p < .001$; $\eta^2 = .07$), in the group with reinforced failure ($F(1, 156) = 75.68$; $p < .001$; $\eta^2 = .33$), and in the group without feedback ($F(1, 156) = 52.94$; $p < .001$; $\eta^2 = .25$).

DISCUSSION

In this experiment, two of the three hypotheses were confirmed. In the case of the third one, the result was statistically significant but the effect had the opposite direction than expected. First of all, the misinformation effect was replicated. This effect is repeatedly replicated in most research (for a review, see Polczyk, 2007). Its good replicability may suggest that the testimony of witnesses may be distorted in many cases. This is obviously relevant for any forensic context, especially because eyewitness testimony remains a very important kind of evidence in contemporary courts (Wells, Memon, & Penrod, 2006). It is therefore of vital importance to be aware of this effect and of ways to protect against it.

As was mentioned in the Introduction, there are not many documented methods of protecting against the misinformation effect. One of them is reinforced self-affirmation. In accordance with Hypothesis 2, it was confirmed that enhancing a person's self-confidence and self-esteem lessens vulnerability to misinformation. This confirms the existing findings (e.g., Szpitalak, 2012; Szpitalak & Polczyk, 2012a). It is worth stressing that in the present experiment different materials were used than in the previous ones, in which the original material was personally relevant for participants. In the present study, the original material was completely irrelevant for the subjects, as it concerned ancient history.

Contrary to expectations, making participants recall their greatest failures in life and giving them negative feedback about the quality of their memory did not increase their susceptibility to misinformation. In contrast, as a result of these

manipulations they became less suggestible compared with the control group. The reduction of vulnerability to misinformation was less pronounced than in the group with reinforced self-affirmation, but remained significant when compared with the control group.

There are various possible interpretations of this effect. First of all, the reinforced failure procedure might have activated negative self-image. The participants who remembered their failures were also given negative feedback about their memory. Carver, Blaney, and Scheier (1979) distinguish between two reactions to a failure. The first one is passive defense of the Self and consists in withdrawing from activity, giving in, and reluctance to undertake further activity. The second one is active and involves increased efforts and will to overcome problems. It is possible that some of the participants in the present study chose the first reaction – they refused to engage in reading the post-event material, and thus, paradoxically, became less vulnerable to the misinformation included in it than the participants from the group in which no recalling of failures and no negative feedback took place. Put simply, if someone refused to read the post-event material carefully, they may have overlooked the misinformation and may not have relied on it while doing the final memory test concerning the original material.

It is also possible that some participants chose the second possible reaction to failure – that is, they engaged intensively in reading the post-event material in order to improve their results. But this may have resulted in becoming more aware of the discrepancies between the original and post-event materials. It is well known that such discrepancy detection reduces the tendency to answer in accordance with the misinformation (Tousignant, Hall, & Loftus, 1986). Both these groups of participants – those restraining from reading the post-event material and those becoming more aware of the discrepancies as a result of reading it intensively – may have contributed to the smaller misinformation effect in the group with reinforced failure.

The procedure applied in the present study does not allow to draw a clear-cut conclusion on whether the mechanisms postulated above really took place and whether some of the participants were really aware of the discrepancies between the original and post-event materials. To determine this, a four-stage procedure akin to that devised by Blank (1998) or Polczyk (2007) would be needed.

In the light of the present results, the reinforced failure effect does not seem to be a great danger from the perspective of applied forensic psychology. As mentioned in the Introduction, the witness may face a situation when their failures will be obvious and receive some sort of negative feedback, too. This,

however, according to the present results, would not lead to increased tendency to rely on misinformation while giving testimony. Of course, the question of whether lowered self-esteem may cause other distortions of memory, apart from the misinformation effect, remains open (e.g., Kensinger, Garoff-Eaton, & Schacter, 2006).

In sum, reinforced self-affirmation seems to be a promising basis for constructing methods of reducing vulnerability to misinformation applicable in forensic practice, even by the police. Developing such a method is the most important future direction in this research area.

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