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Interrogative Suggestibility Revisited: An Analysis of Its Mechanisms, Correlates, and Methods of Reduction

Abstract: Three experiments investigated the mechanisms, correlates, and methods of immunization against interrogative suggestibility (IS). IS involves reliance in memory reports on suggestions contained in misleading questions (Yield) and the tendency to change answers under negative feedback about the quality of previous testimony (Shift). All three studies found that the milder version of the tool used in the studies (GSS) resulted in lower Yield and Shift. In analyses considering the memory states of the participants, IS was found to be highest when participants mistakenly attributed the information contained in the suggestive questions to the original material. However, significant percentages of the participants succumbed to suggestions and changed answers even when they were aware of the discrepancy between the original material and the information contained in the questions. The warning against suggestions was found to lower Yield and Shift, and this was especially true when participants were aware of discrepancies between original material and suggestions. Enhancing self-esteem and inducing mindfulness did not reduce IS. The correlations between IS, including IS in individual mindfulness states, with the Big Five personality traits, anxiety, susceptibility to influence, and self-esteem were inconsistent.

Keywords: *interrogative suggestibility; mild suggestions; source identification errors; reducing interrogative suggestibility; warning; correlates of interrogative suggestibility*

INTRODUCTION

Aims of the Study

Human testimony remains one of the most important sources of information during legal proceedings, despite the development of forensic technology (Brewer & Wells, 2011). It is also well known that mistaken eyewitness evidence can lead to wrongful convictions. In fact, erroneous eyewitness testimony has been linked to about 75% of DNA exoneration cases, surpassing all other factors (Garrett, 2011). Given this, it is extremely important to study factors contributing to wrongful testimonies. One of them is the interrogative suggestibility. The present work is devoted to the empirical analysis of the mechanisms and correlates of interrogative suggest-

ibility, and to examining the effectiveness of methods aimed at reducing it.

Interrogative suggestibility (IS) is defined as 'the extent to which, within a closed social interaction, people come to accept messages communicated during formal questioning, as a result of which their subsequent behavioural response is affected' (Gudjonsson & Clark, 1986, p. 84). It includes two factors: Yield - the tendency to include in answers details congruent with suggestions contained in misleading questions, and Shift - the tendency to change answers as a result of negative feedback concerning the quality of answers given so far (Gudjonsson, 1997). The procedure for measuring it (Gudjonsson Suggestibility Scales, GSS; a detailed description is provided below in the 'Procedure' section) basically



consists of the participant listening to a story and after some time answering questions about it, some of which contain false premises (e.g. 'Did the woman's glasses break in the struggle?', while nothing about broken glasses was mentioned in the story). The number of responses consistent with false premises gives the index Yield. The participant is then told that they have made a lot of mistakes, and they should try harder, and all the questions are asked again. The number of distinct response changes gives the index Shift.

This work concerns four issues related to IS. First, comparing the standard procedure for measuring IS (GSS, Gudjonsson, 1997), which contains rather 'aggressive' suggestions with a milder version of it (Baxter et al., 2006). Second, the mechanisms that may mediate responding to suggestions, namely the role of awareness of the discrepancy between what one has heard oneself and what misleading questions have suggested. Third, the effectiveness of three methods of immunizing against IS was examined: warning, boosting self-confidence, and mindfulness. Fourth, analyses were presented regarding possible individual traits correlated with IS, most frequently described in the literature on the subject.

Minimally Leading Questions

This aim is linked to the fact that the primary tool used to assess IS, namely the Gudjonsson Suggestibility Scales (GSS, Gudjonsson, 1997), primarily addresses susceptibility to rather 'strong' suggestions that are unlikely or inappropriate in actual interview settings (Baxter et al., 2006). In most legal jurisdictions, suggesting information to a witness while they are testifying is considered impermissible and may lead to the testimony being contested (with exceptions such as cross-examination in court or when a party interrogates a hostile witness, an adverse party, or a witness identified with an adverse party, as outlined in the US Federal Rules of Evidence, Rule 611 (c) 1, 2). This poses an issue regarding the ecological validity of measurements conducted using the GSS. It may be limited as it relates to sensitivity to different - stronger - suggestions than those normally made to a real witness. Preliminary data concerning such a modified version of the GSS are presented. Also, the three methods aiming at reducing IS are analysed separately with the standard and mild versions of the GSS. The general hypothesis connected with this aim is that Yield and Shift will be lower in the mild version of the GSS compared to the standard one.

Memory States in the Context of Interrogative Suggestibility

The concept of memory states was presented by Blank (1998) in the context of another paradigm related to the susceptibility of memory reports to suggestion, namely, the memory misinformation paradigm. Here, the participants are first presented with some original material (most often a video clip or a series of slides). After some time, they are presented with some post-event material summarizing the original material, containing details

inconsistent with it. Afterwards they answer questions about the original material. It is now well known that a substantial part of the answers are consistent with misinformation rather than the original content (seminal research: Loftus et al., 1978; for a review see Zaragoza et al., 2007). Blank (1998) analysed the impact of the content of memory on the answers concerning details about which the participants were misled. The most important result of this analysis was the fact that in many cases (up to 40%) answers were consistent with misinformation *despite* the fact that the participants correctly remembered the content of the original material regarding a given misled detail. In other words, the content of memory was correct, but the answers were still wrong. This finding was replicated many times (e.g. Higham et al., 2017; Polczyk, 2017; Szpitalak & Polczyk, 2015a).

We are aware of only two studies in which a similar approach was applied in the context of IS. In the first one, Mastroberardino and Marucci (2013) analysed whether answers consistent with misleading cues are due to the 'internalization of the misleading cues', as they put it, or they are just caused by compliance with the interrogator. In this study an additional procedure was applied after the standard GSS: a 'source identification questionnaire'. It contained the questions from the GSS, and the participants were to indicate where they encountered a specific piece of information necessary to answer a given question: in the original story, in the questions, or they did not know where. Two scores were computed: source identification errors: when participants gave an answer consistent with suggestion (or, in the case of Shift, changed an answer) and attributed the suggested information to the story, and compliant responses: when a suggestive answer was given (or answer was changed) but information was attributed to the *correct* source - the questions. Mastroberardino and Marucci (2013) considered source identification errors as internalization of suggested information. Depending on experimental conditions, the proportion of compliant answers consistent with suggestive questions, that is, when the participants knew that relevant information was only present in the questions, not in the story, was up to about 12% for Yield and 13% for Shift. This confirmed that in the procedure measuring IS it is possible for participants to remember well but still to answer incorrectly, that is, to give an answer consistent with misleading cues despite knowing that relevant information was not present in the story.

In the second study looking at memory states in the context of IS (Polczyk et al., 2024) a modification of the procedure used by Mastroberardino and Marucci (2013) was applied. It turned out that in up to 34% of the cases in which participants were aware that relevant information was not present in the story, they still answered in accordance with suggestive cues.

The aim of the present study related to memory states was to replicate and extend these results in three experiments. A procedure identical to this one used by Polczyk et al. (2024) was applied (described below) and the same hypotheses were tested. Justification of these hypotheses is rooted in the theory of interrogative

suggestibility by Gudjonsson and Clark (1986) and is an extension of it. According to this theory, three elements are necessary for IS to emerge: uncertainty, interpersonal trust, and expectations. Uncertainty arises from the interviewee's lack of certainty regarding the correct response to a question. Interpersonal trust entails the witness sensing the interviewer's sincerity in their intentions. Expectations of success involve the interviewee's confidence in their ability to provide accurate answers to the questions. Thus, if the witness is not certain what is the correct answer, trusts the interviewer, and believes that they should be able to provide a correct answer, they may be vulnerable to the suggestive cues provided by the interviewer. If, in contrast, the witness has no doubts about the answer, and/or does not trust the interviewer, and/or does not assume that giving a correct answer is always possible, their suggestibility will most likely be very small.

Very interestingly, Gudjonsson recently extended his theory by including the quality of source monitoring into it (Gudjonsson, 2022; Gudjonsson & Young, 2021). The new assumption was that 'The main mechanism of interrogative suggestibility is poor 'source monitoring', or more specifically 'source confusion [...]' (Gudjonsson et al., 2022, p. 2). In other words, suggestible answers, that is, answers consistent with suggestive cues arise from the fact that the witness mistakenly believes that a given piece of information, which actually was only included in suggestive questions, was 'indeed' present during a given original event. In addition, Gudjonsson et al. (2022) as well as Gudjonsson and Young (2021) argue that non-suggestible answers ('resistant behavioural responses', RBRs) are different according to the results of source monitoring. Namely, 'direct' explanation (e.g. 'It wasn't mentioned in the story') is a result of correct source monitoring, whereas 'don't know' answers mean that the participant was not able to detect discrepancies between the original story and the information included in the misleading questions.

It seems that the biggest problem with this approach is the assumption that a correct source monitoring assures a non-suggestible answer (precludes a suggestible one). In the present work, one of the key hypotheses is that it is possible for a participant to correctly ascribe information to its sources, therefore, to correctly detect discrepancies between what the misleading question suggested and what was actually mentioned in the original story, and *still* give an answer consistent with what was in the misleading question. This is possible for at least one reason: the person may not trust their own memory as regards the original material and assume that the information included in the question is correct. After all, the participant does not know that some questions are deliberately created so that they contain misinformation.

As mentioned above, in the memory misinformation paradigm it is now commonly assumed that it is possible to correctly detect discrepancies between the original material and the postevent information and still give answers consistent with misinformation (Blank, 1998; Higham et al., 2017; Polczyk, 2017; Szpitalak & Polczyk, 2015a). Given this, and given the results obtained by Mastrober-

ardino and Marucci (2013) and Polczyk et al. (2024), mentioned above, one of the key hypotheses put forward in this study was that interrogative suggestibility will be present even when the participants knew that a certain information was only present in the questions but not in the original story. A special procedure, described below, called the Source Identification Questionnaire (SIQ), allowed for detecting three memory states: (1) source identification error (SIE) – the participant believed that a given detail was mentioned in the story, while in reality it was only suggested by the question; (2) discrepancy detection - the participant knew that a given detail was not mentioned in the story (giving an answer consistent with the suggestion was considered to be conformity, 'C'), and (3) the participant did not know where relevant information was mentioned (DK). Correspondingly, the following indices were scored and analysed: Yield-SIE and Shift-SIE: yielding to suggestions and changing answers in the 'memory alteration' situation – when source identification errors were committed; Yield-C and Shift-C – when suggestive answers and changing answers took place while the participant was aware that a given information was not present in the story ('conformity'), and Yield-DK and Shift-DK: yielding and shifting when the participant did not know where relevant information was (apparently 'filling memory gaps' was present).

Reducing Interrogative Suggestibility

Given the importance of human testimony in real forensic settings and the possible consequences of the impact of suggestions on it, an important part of research on IS should be aimed at reducing the vulnerability of eyewitnesses to it. Surprisingly, little research of this kind in the context of IS was performed. In a few experiments (described below), warning against suggestions and enhancing self-esteem were successfully applied. Apart from this, it is difficult to locate any research of this kind. Rossi-Arnaud et al. (2019) found that Yield, but not Shift, was reduced when there were pairs of participants collaborating while being administered the GSS. Wagstaff et al. (2011) found that focused meditation – a sort of relaxation procedure involving deep breathing and relax – reduced both Yield and Shift.

Given the scarcity of research exploring methods for reducing IS we decided to perform our own, applying three methods: warning, enhancing self-esteem, and inducing mindfulness.

Warning

In one of their experiments, Boon and Baxter (2000) explored the effects of warning against 'misleading questions' issued before the first set of questions and repeated before the second set. Compared to non-warned groups, both Yield and Shift were lower in the warned group. These results were extended in another study (Bain et al., 2004) in which the effects of warning were analyzed in the context of the interviewer's demeanour: Friendly versus Abrupt. It turned out that warning lowered Yield, but as regards Shift, an important interaction with the

interviewer's demeanour emerged: warning even *increased* the number of changed answers in the Friendly condition but lowered it in the Abrupt one. In yet another experiment (Baxter et al., 2006) in which the 'mild' version of the GSS was applied, warning was again analyzed in the context of friendly vs. firm behaviour of the experimenter. Yield was not scored in this study, but Shift was the highest in the 'Firm-Unwarned' group and the lowest in the 'Friendly-Warned' one.

In the studies described above warning was applied before suggestive questions were asked. In contrast, Wachi et al. (2019) first administered the GSS and after two days told the participants in one subgroup that the false feedback from the first session was false. In general, yielding to suggestions was higher after two days than on the first session, but this increase was smaller in the warned group compared to the non-warned one.

The warning was also examined in the context of the three-step misinformation paradigm described above. A metaanalysis of this research (Blank & Launay, 2014) indicated that warning was generally effective although this efficacy varied considerably among experiments.

Taken all the results described above together, warning seems to be a promising method for reducing IS. In the present study an additional hypothesis was put forward, namely, it was assumed that the warning would be efficient when the participants were aware of the discrepancies between the content of the story and the information suggested by the questions. It should be so because without such awareness warning simply has no chance to be effective. If someone is warned that he may encounter some false information but does not know which information is false, the warning is of little use. In the area of IS we are not aware of any research linking warning and discrepancy detections, but in the context of the misinformation paradigm such research exists and confirms that warning is less effective when the participants are not aware of the inconsistencies between the original and postevent materials (Blank, 1998; Higham et al., 2017; Polczyk, 2017).

Enhancing Self-Esteem

The second method hypothesized to reduce IS in the present study was enhancing self-esteem by means of reinforced self-affirmation (RSA; Szpitalak, 2012). Technically, this technique consists of two components: self-affirmation consisting of making the participants aware of their greatest life achievements, and reinforcement: a mock positive feedback about their performance in a memory task. RSA was devised as a method of reducing vulnerability to misinformation in the three-stage misinformation paradigm. The hypothesis about its effectiveness was based on the assumption that at least some of the participants are aware of the discrepancies between the original and postevent material and therefore experience contradictions. In such a situation, some participants will think that they are wrong and that the postevent material must be 'right', and will give an answer consistent with the misinformation. Another part of the participants may believe that their memory is correct and will answer in accordance with their

own memory, not with misinformation. The hypothesis about the effectiveness of RSA was based on the assumption that higher self-esteem will result in a greater tendency to rely on one's own memories, therefore increasing it situationally will result in greater resistance to misinformation. In accordance with these assumptions, RSA effectively reduced vulnerability to misinformation in a number of experiments (Szpitalak, 2012, 2022; Szpitalak & Polczyk, 2015a, 2019a, 2019b, 2020, but see also Kękuś et al., 2023). What's more, in two experiments RSA effectively reduced IS (Szpitalak & Polczyk, 2016, 2020).

Based on similar reasoning (and existing results), it was assumed that RSA would reduce IS. It was also assumed that it would be particularly effective when participants detect discrepancies between the content of the original story and the information contained in the questions. Only then can increased self-confidence result in relying on one's own memory of the story. Interestingly, the assumption that RSA is more effective when there is discrepancy detection has already been confirmed in the case of the misinformation paradigm (Szpitalak & Polczyk, 2015a).

Mindfulness

The third method analyzed in the present study as a means to reduce IS was mindfulness. The concept of mindfulness/mindlessness was introduced and developed by Langer (Langer, 1989; Langer et al., 1978; Langer & Moldoveanu, 2000). In one well-known study (Langer et al., 1978), people waiting in a queue to a copy machine were asked to let another person (the experimenter) to copy without queuing. The request was either easy or more difficult, and three versions of it were manipulated: a logical reason, a placebo one ('because I want to make copies'), or no request. Langer et al. (1978) found that when the request was easy, the placebo reason was as effective as the logical one and interpreted this as result of activating a mindless state of the mind.

In the area of IS (or the misinformation paradigm) we were not able to locate any research linking mindfulness with IS. However, interesting and potentially relevant experiments were presented by Maciuszek and Garlicka (2017). They induced the state of mindfulness in the experimental group (by generating many ideas to a question or analyzing a problem from different perspectives) and analyzed reactions to highly suggestive questions containing presuppositions, e.g. 'Would you like to perform an additional task on the computer right away or after a short break?' or 'Did Moses take into the ark: his immediate family, or further relatives?' (in fact, of course, Noe did, not Moses). Maciuszek and Garlicka (2017) found a consistent increase in resistance to the contents suggested in presuppositions due to mindfulness.

We hypothesized that a mindful state of mind would reduce the thoughtless acceptance of suggestions included in the questions and therefore reduce IS. As in the case of warning and increasing self-esteem, we expected mindfulness to be particularly effective when the participants realized the discrepancies between the original story and

the suggestive cues. In such situations a thoughtful reflection about the situation should help to take a decision that one's own memory is correct. Also, when the participants did not know if relevant information was present in the story, mindfulness should help them to restrain from reporting a given detail. In the cases, however, when the participants believed that a given detail was included in the story, we did not expect mindfulness to be effective in preventing IS.

Correlates of Interrogative Suggestibility

An important part of the research on IS is studying the personal traits correlated with it. Despite many analyses of this kind, the results are far from conclusive. As for demographic differences, gender differences were rarely reported in research about IS. When they were, the results generally indicated no consistent gender differences (Gudjonsson et al., 2016; Pollard et al., 2004; Roma et al., 2011; Zangrossi et al., 2020). As for age, most research indicates that IS diminishes with age, and children have elevated IS compared with adults (e.g. Frumkin et al., 2012; Danielsdottir et al., 1993; Gudjonsson et al., 2016; Lee, 2004; Zangrossi, 2020) but exceptions exist (e.g. Hünefeldt et al., 2008). Some studies looked at IS in the elderly age, usually finding elevated IS scores in the elderly compared to younger adults (e.g. Biondi et al., 2020; Dukała & Polczyk, 2013; Polczyk et al., 2004).

Two traits that seem to be related to IS most consistently (and negatively) are memory quality and general intelligence. In most research recall scores of the GSS were applied as the index of memory (e.g. Candel et al., 2000; Danielsdottir, 1993; Gudjonsson, 1983; 1988; Richardson & Kelly, 1995; Sharrock & Gudjonsson, 1993; Singh & Gudjonsson, 1992), but independent measures of memory were applied as well (Biondi et al., 2020; Drake et al., 2013; Polczyk et al., 2004, 2024; Zangrossi et al., 2020). General intelligence was a negative predictor of IS in most research, somewhat more often with Yield than Shift (e.g. Bianco & Curci, 2015; Biondi et al., 2020; Candel et al., 2000; Frumkin et al., 2012; Gudjonsson, 1983, 1988; Lee, 2004; Polczyk, 2005; Singh & Gudjonsson, 1992).

Apart from memory and intelligence, the correlations of various traits with IS were much less consistent. Self-esteem was quite often studied, and Hooper et al. (2016) presented a systematic review of research on the relationship between it and IS. Among nine studies that met their criteria, five found self-esteem to be related to at least one aspect of suggestibility, and four found no significant relationships.. Hooper et al. (2016) concluded that firm conclusions were difficult given the diversity of definitions and operationalizations of self-esteem in this research.

Some studies found a positive correlation between anxiety and IS (e.g. Gudjonsson et al., 1995; Hansdottir et al., 1990; Wolfradt & Meyer, 1998) but many more did not confirm this (e.g. Bianco & Curci, 2015; Drake, 2014; Malinoski & Lynn, 1999; Maras & Bowler, 2012; North et al., 2008; Polczyk, 2005).

As for primary personality traits the results were also mixed, with the majority of studies founding no consistent

relationships with IS. Liebman et al. (2002) presented results of a comprehensive research in which they used, among others, the NEO-PI R (Costa & McCrae, 1992) and the MPQ questionnaire (Tellegen, 1982). None of the Big Five dimensions correlated with IS; just two facets out of 30 were significantly negatively related to IS: activity from the dimension Extraversion with Yield, and competence from Consciousness with Shift. From the 14 traits from the MPQ none was related to Shift and Traditionalism was positively correlated with Yield. Malinoski and Lynn (1999) and Polczyk (2005) found no significant relationship between the Big Five traits and IS. Bianco and Curci (2005), and Haraldsson (1985) found no significant relationships between neuroticism, extraversion, and psychoticism from the EPQ-R (Eysenck & Eysenck, 1991) and IS. In contrast, Drake (2010a, b) and Gudjonsson (1983) found some correlations of neuroticism with IS.

In the present research an analysis of correlates of personality with IS was performed, under the following premises:

- a sample large enough to assure adequate power to detect correlations of at least reasonable size (see power analysis below). Some of the results reported in the literature were seriously underpowered (e.g. Maras & Bowler, 2012: *n* from 29 to 31);
- a reasonably diverse sample as regards age and education, but not children nor elderly people;
- an analysis separately for Yield and Shift, without taking into account the Total Suggestibility (the sum of both indices). Yield and Shift are really different phenomena and summing them up makes little sense apart of clinical diagnosis of general suggestibility. It is not rare in the literature to report significant effects for Total Suggestibility but for one of the indices in the same time. It even happened that neither Yield nor Shift were significant but the sum of them was, probably due to a broader range of results (Gudjonsson, 1983, results for neuroticism);
- analyses including memory states: yielding to suggestions and shifting answers while thinking that information was present in the story (SIE), knowing that it was not (C) and not knowing at all where relevant information was (DK).

Following individual traits were measured and used in correlational analyses: immediate and delayed memory of the story from the GSS (Recall 1 and Recall 2), big-five dimensions of personality, susceptibility to social influence and compliance, anxiety, and self esteem. Anxiety, neuroticism, and susceptibility to influence should correlate with IS positively because they may be related negatively with subjective confidence in one's memories, and lower confidence should result in higher IS. Self-esteem should correlate with IS negatively because it should enhance subjective confidence in one's memories. This also means that the correlations should be more pronounced in the case of Shift, as this is a phenomenon closely related to social influence – in the form of negative feedback. Yield may be more connected with memory processes; therefore, we expected it to be correlated

negatively with memory scores rather. Extraversion, openness, agreeableness, and consciousness were included for exploratory reasons.

As usually in this project, hypotheses relating to Yield and Shift in the context of memory states are more important:

- Anxiety, neuroticism, susceptibility to influence, and self-esteem will be more related to Yield-C than Yield-SIE, while memory quality will be more related to Yield-SIE than Yield-C.
- Anxiety, neuroticism, susceptibility to influence and self-esteem will be more related to Shift-C than Shift-SIE, while memory quality will be more related to Shift-SIE than Shift-C.

The ‘C’ condition means that a participant was aware of the discrepancies between the story and the information included in the questions. In such a situation, the participants have two options: to rely on their own memory, or on external sources. Our general hypothesis in this project is that those who are anxious, have low self-confidence and self-esteem, and are prone to influence, would rely on external sources rather than their own memories. But if memory failures take place, such individual traits are of less importance.

Summary of Hypotheses

The following detailed hypotheses were tested in the present study:

Comparison of the Standard and Mild Versions

Hypothesis 1. Yield will be lower in the case of the mild version of the GSS than the standard one.

Hypothesis 2. Shift will be lower in the case of the mild version of the GSS than in the standard one.

Memory States

Hypothesis 3. Yield-SIE will be higher than Yield-C and Yield-DK.

Hypothesis 4. Shift-SIE will be lower than Shift-C and Shift-DK.

Reducing Interrogative Suggestibility

Hypothesis 5a. Warning will reduce Yield

Hypothesis 5b. Warning will reduce Shift.

Hypothesis 6a. Warning will reduce Yield-C but not Yield-SIE.

Hypothesis 6b. Warning will reduce Shift-C but not Shift-SIE.

Hypothesis 7a. RSA will reduce Yield.

Hypothesis 7b. RSA will reduce Shift.

Hypothesis 8a. RSA will reduce Yield-C but not Yield-SIE.

Hypothesis 8b. RSA will reduce Shift-C but not Shift-SIE.

Hypothesis 9a. Mindfulness will reduce Yield.

Hypothesis 9b. Mindfulness will reduce Shift.

Hypothesis 10a. Mindfulness will reduce Yield-C but not Yield-SIE.

Hypothesis 10b. Mindfulness will reduce Shift-C but not Shift-SIE.

Correlates of Interrogative Suggestibility

Hypothesis 11a. Anxiety, neuroticism, and susceptibility to influence will be positively related to Yield and Shift. Self-esteem will be positively related to Yield and Shift.

Hypothesis 11b. Memory scores will be negatively related more to Yield than Shift.

Hypothesis 11c. Personality traits will be related more to Shift than Yield.

Hypothesis 12a. Anxiety, neuroticism, susceptibility to influence, and self-esteem will be more related to Yield-C than Yield-SIE, while memory quality will be more related to Yield-SIE than Yield-C.

Hypothesis 12b. Anxiety, neuroticism, susceptibility to influence and self-esteem will be more related to Shift-C than Shift-SIE, while memory quality will be more related to Shift-SIE than Shift-C.

In all analyses, Yield and Shift were analyzed separately. Total suggestibility was omitted because, as described above, it is a combination of two rather separate factors. Three experiments were performed. In Experiment 1, warning against suggestions was analyzed. In Experiment 2, enhancing self-esteem was explored. Experiment 3 was about inducing mindfulness. Finally, correlational analyses were performed.

Power Analysis

A priori power analyses were performed to determine the sample sizes needed to detect small, medium, and large effects, for the three main methods of analysis applied in the present research: 2×2 between-subjects ANOVA, repeated measures ANOVA, and Pearson *r* correlations. Analyses were performed by means of the G*Power software (Faul et al., 2007). Power of 90% was assumed. As for the between-subjects ANOVA, the samples needed to detect small, medium, and large effects ($f = .10, .25, \text{ and } .40$) were 1053, 171, and 68, respectively. For a repeated-measures ANOVA with three levels, the required samples were 213, 36, and 15. For correlations ($r = .10, .30, \text{ and } .50$) the samples were 1047, 113, and 38. Given the organizational and financial constraints (the research was supported by a grant), sample sizes in each of the three experiments of about 190-200 participants were assumed, and 145 were available for the correlational analyses. Such samples assured reasonable power to detect medium and large, but not small, effects.

EXPERIMENT 1 – WARNING

In this and in the following experiments, a positive opinion from the Research Ethics Committee (Jagiellonian University, Department of Philosophy, Kraków, Poland) in the higher education institution in Cracow, Poland was obtained (Opinion No. 221.0042.39). Written signed informed consent was obtained from all participants.

Participants

One hundred and ninety-five participants took part in the experiment (143 women); mean age: 25.1 years, $SD = 6.9$, range: 18 – 50), recruited from the general

population through advertisements in the mass media and on the Internet. They were paid 30 PLN (about 8 €) for participation.

Tools

Gudjonsson Suggestibility Scale (GSS 2; Gudjonsson, 1997; Polish adaptation: Polczyk, 2005) comprises a spoken narrative and 20 questions about the narrative. The participant is told that the procedure is about memory, and listens to the recording of the story. The story has to be recalled, giving the immediate recall score, with a range of 0 to 40 chunks of information. After 50 minutes, the story has to be recalled again. Afterwards, 20 questions are asked, 15 of which contain misleading cues (e.g. ‘Did the woman’s glasses break in the fight’, while the story did not mention any glasses). The remaining five questions are buffers. The number of answers in which a given suggestion was clearly accepted gives the index called Yield 1 – the tendency to include in the answers misleading suggestions included in the questions, with a range from 0 to 15. The participant is then told in a firm way: ‘*You have made a number of errors. It is therefore necessary to go through the questions once more, and this time try to be more accurate*’, and all the 20 questions are asked again. Any clear change in answers is scored one point, giving the index called Shift – the tendency for changing answers after negative feedback (range: 0 – 20). There are two versions of the GSS which are identical in the procedure but contain different stories and questions. In the present research, version GSS 2 was used.

The mild version of the GSS 2 was a direct translation of the questions used by Baxter et al. (2006). The mild version contained revised questions, while the story content and negative feedback were the same as in the standard version. In the present research, the internal consistency (Chronbach’s alphas) for Yield 1 and Shift were .78 and .71 for the standard version, and .66 and .60 for the mild one. Yield 2 – the number of answers accepting suggestions after negative feedback, and Total Suggestibility – the sum of Yield 1 and Shift can also be scored but were not used in the present study.

The Source Identification Questionnaire (SIQ) was based on the procedure presented by Mastroberardino and Marucci (2013). After the standard procedure for the GSS, it was explained to the participants that their suggestibility rather than memory was tested. They were then presented with all the 20 questions from the GSS again and asked to indicate what information was in the story with respect to any question, choosing from four options: (1) “Information was present in the story” – this means that the participant committed a source identification error (SIE); (2) “Information was not present in the story” – the participant was aware of the discrepancy between suggestion included in misleading questions and the story. In other words, the participant knew that relevant information was not included in the original story. Suggestible answers were treated as compliance (C); (3) “I don’t know whether information was present in

the study” (DK), and (4) “Other response”. In the present research, ‘other’ responses were not analyzed.

Following indexes were computed from the SIQ: Yield-SIE: the proportion of answers accepting suggestions from questions in which SIE was committed; Yield-C: the proportion of answers accepting suggestions in questions in the case of which the participant knew that relevant information was only present in the questions, not in the story; and Yield-DK: the proportion of answers accepting suggestions from questions in the case of which the participant did not know where relevant information was. The same indexes were calculated for Shift, giving scores: Shift-SIE, Shift-C, and Shift-DK.

Filler Questionnaires

The 50-minutes break which is a part of the GSS procedure was filled with various questionnaires, which were then used in the correlational analyses. They are described below in the section “Analyses of correlations”.

Procedure

The experiment was performed in a laboratory (not online). The participants were tested individually. Upon arrival, they were told that the research was about memory and various traits of personality. The GSS 2 was then applied: the participants listened to a recording of the story and gave free recall of it. Next, they were filling various questionnaires for 50 minutes. After this, the participants recalled the story again. Next, in the experimental group they were told: ‘I am going to ask you some questions about the story. Try to be as accurate as you can. I warn you that some of the questions may be misleading and actually suggesting you a given answer. Be careful not to rely on the cues and suggestions included in the questions’. In the control group, no warning was issued. The 20 questions were then asked. Afterwards, all participants in both group were given the negative feedback; they were told: ‘You have made a number of errors. It is therefore necessary to go through the questions once more, and this time try to be more accurate’. All 20 questions were then asked again. After that, the SIQ was applied, as described above. Finally, the participants were fully debriefed.

RESULTS

An analysis of variance with two between-subjects factors: the mild vs. the standard version of the GSS, and the warned vs. not warned group was performed. The main effect of the version was significant for both Yield and Shift (ANOVAs, respectively: $F(1, 191) = 7.06, p = .009, \eta^2 = .04$; $F(1, 191) = 5.96, p = .016, \eta^2 = .03$). In both cases, suggestibility was lower in the mild version of the GSS than in the standard one (see Table 1). This confirms Hypotheses 1 and 2.

As for the warning analyzed as the main effect (not taking into account the version), it significantly reduced Yield ($F(1, 191) = 8.85, p = .003, \eta^2 = .04$) but not Shift ($F(1, 191) = 1.88, p = .172, \eta^2 = .01$). However, significant interactions of warning and version were present for both

indices (Yield: $F(1, 191) = 4.89, p = .028, \eta^2 = .02$; Shift: $F(1, 191) = 4.05, p = .046, \eta^2 = .02$). In the case of Yield, the effect of warning was significant in the group with the standard version of the GSS, $p < .001$ but not the mild one, $p = .585$. Similar results were present in the case of Shift (ps , respectively: $.019$ and $.647$). In general, these results confirm Hypotheses 5a and 5b.

The next analyses concerned the impact of memory states on suggestibility. The mean proportions of answers consistent with misleading cues and changes of answers after negative feedback for three conditions of memory states were calculated. Repeated measures ANOVA was based on a sample of 130 participants who had results in all three conditions (SIE, C, and DK). In cases when the sphericity assumption was not met, as indicated by the Mauchly test, the Greenhouse-Geisser correction of the

degrees of freedom was applied; such analyses were marked as ' F_{GG} '. As for the Yield, significant differences between the three conditions were present, $F_{GG}(1.61, 208.21) = 243.28, p < .001, \eta^2 = .65$. Subsequent analyses of simple effects revealed that yielding to suggestions was higher in the case of Yield-SIE than Yield-C and Yield-DK, as well as Yield-C was lower than Yield-DK, all $ps < .001$ (respective means and standard deviations: Table 1). This confirms Hypothesis 3. Importantly, when participants knew that relevant information was only present in the questions but not in the text, they still gave answers consistent with this (mis)information in 10% of the cases.

As for the Shift, the means in the three conditions were statistically significantly different, $F_{GG}(1.90, 244.45) = 28.95, p < .001, \eta^2 = .18$. Analyses of simple effects revealed that shifting answers was less common in

Table 1 Means and Standard Deviations for the Standard and Mild Versions in the Groups With and Without Warning for All Dependent Variables

		Not warned		Warned		Total		Not warned	Warned	Total
		M	SD	M	SD	M	SD	<i>n</i>	<i>n</i>	<i>n</i>
Yield	Mild	3.30	2.17	3.02	1.81	3.16	1.99	50	50	100
	Standard	5.09	2.99	3.18	3.09	4.11	3.17	46	49	95
	Total	4.16	2.73	3.10	2.52	3.62	2.67	96	99	195
Shift	Mild	3.90	3.00	4.18	3.14	4.04	3.06	50	50	100
	Standard	5.85	3.30	4.37	2.76	5.08	3.11	46	49	95
	Total	4.83	3.28	4.27	2.94	4.55	3.12	96	99	195
Yield SIE	Mild	.82	.27	.82	.29	.82	.28	48	47	95
	Standard	.79	.30	.69	.35	.74	.33	36	37	73
	Total	.81	.28	.76	.33	.78	.30	84	84	168
Yield C	Mild	.07	.11	.05	.08	.06	.10	49	49	98
	Standard	.21	.18	.09	.15	.15	.18	46	49	95
	Total	.14	.16	.07	.12	.10	.15	95	98	193
Yield DK	Mild	.25	.31	.22	.26	.23	.28	37	45	82
	Standard	.38	.32	.32	.36	.35	.34	35	38	73
	Total	.31	.32	.27	.32	.29	.32	72	83	155
Shift SIE	Mild	.15	.25	.22	.30	.18	.28	48	47	95
	Standard	.37	.38	.19	.26	.28	.34	36	37	73
	Total	.24	.33	.21	.28	.22	.31	84	84	168
Shift C	Mild	.19	.23	.16	.19	.17	.21	49	49	98
	Standard	.32	.25	.25	.21	.28	.23	46	49	95
	Total	.25	.25	.20	.20	.23	.23	95	98	193
Shift DK	Mild	.41	.32	.43	.37	.42	.34	37	45	82
	Standard	.48	.27	.48	.37	.48	.32	35	38	73
	Total	.44	.29	.45	.37	.45	.34	72	83	155

the Shift-SIE condition than Shift-DK, as well Shift-C was lower than Shift-DK (both $ps < .001$), whereas Shift-SIE and Shift-C did not differ significantly, $p = .769$. Again, realizing the discrepancies between the information contained in the story and in the questions did not prevent from changing the answers after negative feedback. In general, these results confirm Hypothesis 4 only partially as we expected that Shift-SIE would be lower than Shift-C.

The next analyses concerned the efficacy of warning in SIE, C, and DK conditions. It was hypothesized that warning would be effective in the case of Yield-C and Shift-C, but not Yield-SIE and Shift-SIE. This hypothesis was fully supported in the case of Yield. When the participants attributed the misinformation to the original story (the SIE condition), the warning had no effect on Yield, neither as the main effect, $F(1, 164) = 1.34$, $p = .249$, $\eta^2 = .01$, nor in interaction with the version (standard vs. mild), $F(1, 164) = 1.25$, $p = .265$, $\eta^2 = .01$. When the participants knew that relevant information was only present in the questions (the C condition), warning effectively reduced the Yield as the main effect, $F(1, 189) = 11.98$, $p = .001$, $\eta^2 = .06$. In the analysis including the version as factor it turned out that the interaction was significant, $F(1, 189) = 5.50$, $p = .020$, $\eta^2 = .03$, and warning was effective in the standard version of the GSS, $p < .001$ but not the mild one, $p = .428$. When the participants did not know where the relevant information was (the Yield-DK condition), warning was not effective, neither as the main effect, $F(1, 151) = 0.79$, $p = .376$, $\eta^2 = .01$, nor in interaction with the version, $F(1, 151) = 0.09$, $p = .760$, $\eta^2 < .01$. In sum, Hypothesis 6a was confirmed.

Similar analyses were performed for Shift. As for Shift-SIE, the main effect of warning proved insignificant, $F(1, 164) = 1.16$, $p = .282$, $\eta^2 = .01$. Warning was however significant in interaction with the version, $F(1, 164) = 6.84$, $p = .010$, $\eta^2 = .04$. In the light of simple effects, warning was not effective in the mild version, $p = .245$, but it did reduce Shift in the case of the standard one, $p = .015$. In contrast, Shift-C and Shift-DK were neither significant as the main effects, $F(1, 189) = 2.83$, $p = .094$, $\eta^2 = .01$ and $F(1, 151) = 0.03$, $p = .859$, $\eta^2 < .01$, nor in interaction with the version, $F(1, 189) = 0.61$, $p = .437$, $\eta^2 < .001$ and $F(1, 151) = 0.05$, $p = .827$, $\eta^2 < .01$, respectively. Hypothesis 6b was not confirmed.

Discussion of Results - Experiment 1

Results on the Yield were lower in the mild version than in the standard one, in accordance with Hypothesis 1. This means that the suggestive influence of misleading questions was indeed lower when most "aggressive" suggestions (especially closed alternatives) were removed and replaced. The results on Shift were also lower in the case of the mild version, compared to the standard one, confirming Hypothesis 2. It is possible that the uncertainty of the participants was somewhat higher in the case of the standard (more 'aggressive') version of the suggestive questions, compared to the mild version. Higher uncertainty might have resulted in the negative feedback regarding the quality of answers more effective.

Hypotheses relating to the impact of memory states on interrogative suggestibility were confirmed in the case of Yield: it was the highest, when the participants thought that relevant information was present in the story (in fact, it was only present in the misleading questions). In such cases, the participants probably did not experience any discrepancies between the sources of information and succumbed to the misinformation. Yielding to it was much lower when participants realized that relevant information was only present in the questions themselves. What is crucially important however is the fact that even in such situation yielding to suggestions was not trivial: in about 10% of such cases the answer was still consistent with misinformation. This means that correct detection of discrepancies between the misleading questions and the original material coupled with a correct identification of sources of information does not guarantee a correct answer, not consistent with misinformation.

Interestingly, things were different in the case of Shift. Changing answers after a negative feedback was most often when the participants did not know where relevant information was – in the original story or the questions. This result is congruent with the hypothesis stating that in such situations the uncertainty on the part of the participants was the highest and therefore their vulnerability to feedback stating that many answers were wrong was the highest as well. Changing answers in the SIE situation, that is, when the participants thought that appropriate information was in the story, was low – this is understandable because in such cases the participants probably believed that their answers are correct and are not the ones to which the negative feedback referred. However, changing answers was generally low also in the situation in which the participants knew that relevant information was only included in the questions. In any case, in the C condition, that is, when participants discovered discrepancies between the story and the premises included in the questions, in about 23% of the cases they still changed their answers after negative feedback.

Warning successfully reduced Yield when the participants correctly detected discrepancies between the story and the questions but not when they thought that relevant information was included in the story. Again, this is congruent with the hypothesis: when a participant did not detect any discrepancies between the original story and the misinformation included in the misleading questions, warning simply has no chance to be effective. When one is warned against misinformation but does not realize where this misinformation is, the warning is of little use. As for the Shift however, warning was only effective in the SIE situation – when the participants thought that appropriate information was in the story, thus no discrepancies were detected.

EXPERIMENT 2 – ENHANCING SELF-ESTEEM

Participants

One hundred and ninety-nine persons recruited from the general population through advertisements in the mass media and on the Internet took part in this experiment

(137 women, 61 men); their mean age was 26.5 years ($SD = 9.5$). They were paid 30 PLN (about 8 €) for participation.

Tools and Procedure

The procedure and the tools were identical to Experiment, but instead of warning, RSA was applied before the first set of questions. It consisted of two parts. In the first part, self-affirmation was induced by means of making the participants in the experimental group aware of their greatest life achievements: they were writing these achievements down. In the control group, the participants were describing their route from home to the laboratory. Next, in the RSA group false positive feedback about the quality of memory was performed: the participants had to memorize 60 nouns for 5 minutes, and afterwards, to write down as many of them as they could remember. They were then told that their results were good. Participants in the control group were performing the same memory task, but were given no feedback. The remaining procedure was the same as in Experiment 1.

RESULTS

Table 2 presents descriptive data for all dependent variables across experimental conditions. At first, the impact of the factors 'version' and 'RSA' on interrogative suggestibility was analyzed by means of a two-factor ANOVA. The main effect of version was significant for both Yield and Shift – suggestibility was lower in the case of the mild version than the standard one ($F(1, 194) = 18.89, p < .001, \eta^2 = .10$ and $F(1, 194) = 11.00, p = .001, \eta^2 = .10$, respectively), again confirming Hypotheses 1 and 2. As for RSA, its effects on Yield and Shift were not significant, neither as the main effect ($F(1, 194) = 0.18, p = .673, \eta^2 < .01$ and $F(1, 194) = 2.21, p = .139, \eta^2 = .01$, respectively) nor in interaction with the version ($F(1, 194) = 1.50, p = .222, \eta^2 = .01$ and $F(1, 194) = 0.02, p = .888, \eta^2 < .01$, respectively). This left Hypotheses 7a and 7b without confirmation.

Similarly to Experiment 1, next analyses concerned interrogative suggestibility analyzed in the context of memory states. At first, SIE, C, and DK conditions were

Table 2. Means and Standard Deviations for the Standard and Mild Versions in the Groups With and Without RSA for All Dependent Variables

		No RSA		RSA		Total		No RSA	RSA	Total
		M	SD	M	SD	M	SD	<i>n</i>	<i>n</i>	<i>n</i>
Yield 1	Mild	3.63	2.40	3.98	2.36	3.80	2.37	49	48	97
	Standard	6.04	3.31	5.33	3.79	5.69	3.55	52	49	101
	Total	4.87	3.14	4.66	3.22	4.77	3.17	101	97	198
Shift	Mild	3.71	2.62	4.29	2.74	4.00	2.68	49	48	97
	Standard	5.08	3.37	5.78	3.24	5.42	3.31	52	49	101
	Total	4.42	3.09	5.04	3.08	4.72	3.09	101	97	198
Yield 1 SIE	Mild	0.77	0.27	0.78	0.29	0.78	0.28	45	43	88
	Standard	0.81	0.31	0.74	0.36	0.77	0.34	40	40	80
	Total	0.79	0.29	0.76	0.32	0.78	0.31	85	83	168
Yield 1 C	Mild	0.11	0.14	0.14	0.17	0.12	0.15	48	48	96
	Standard	0.30	0.24	0.30	0.29	0.30	0.26	50	48	98
	Total	0.20	0.22	0.22	0.25	0.21	0.23	98	96	194
Yield 1 DK	Mild	0.27	0.32	0.29	0.32	0.28	0.32	42	39	81
	Standard	0.45	0.36	0.42	0.36	0.43	0.36	44	36	80
	Total	0.36	0.35	0.35	0.34	0.36	0.35	86	75	161
Shift SIE	Mild	0.19	0.24	0.19	0.26	0.19	0.25	45	43	88
	Standard	0.25	0.32	0.30	0.34	0.27	0.33	40	40	80
	Total	0.22	0.28	0.24	0.30	0.23	0.29	85	83	168
Shift C	Mild	.19	.21	.22	.21	0.20	.21	48	48	96
	Standard	.31	.27	.31	.25	0.31	.26	50	48	98
	Total	.25	.25	.26	.24	0.26	.24	98	96	194
Shift DK	Mild	0.26	0.29	0.44	0.37	0.35	0.34	42	39	81
	Standard	0.39	0.38	0.56	0.33	0.46	0.37	44	36	80
	Total	0.32	0.34	0.50	0.35	0.41	0.36	86	75	161

compared. It turned out that the differences among the three conditions as regards Yield were statistically significant, $F_{GG}(1.91, 257.80) = 154.56, p < .001, \eta^2 = .53$. Yield-SIE was significantly higher than Yield-C, $p < .001$. Also, Yield-SIE was significantly higher than Yield-DK, $p < 0.001$. Finally, Yield-C was lower than Yield-DK, $p < .001$. This confirms Hypothesis 3. Importantly, in the light of the results for Yield-C it can be concluded that in about 21% of the cases in which the participants knew that relevant information was only present in the questions but not in the story, the answers were still consistent with this (mis)information included in the questions.

Similar analyses for the Shift revealed that the means for Shift-SIE and Shift-C ($M = 0.24, SD = 0.24$) were significantly lower than Shift-DK ($M = 0.41, SD = 0.36$, both $ps < .001$). However, Shift-SIE and Shift-C did not differ significantly ($p = .646$). Therefore, Hypothesis 4 was confirmed only partially.

The next analyses concerned hypotheses relating to the efficacy of RSA in SIE, C, and DK conditions. It was hypothesized that RSA would be effective in the case of YIELD-C and SHIFT-C, but not YIELD-SIE and SHIFT-SIE. Such analyses are still possible despite the lack of general efficacy of RSA in the case of Yield and Shift, as it is possible that RSA is only effective in the case of some memory states. In particular, it was hypothesized that RSA would be effective when the participants were aware of the discrepancies between the original story and the information suggested by the questions, but not when they thought that relevant information was included in the story. This hypothesis was not confirmed. RSA as the main effect was indeed inefficient in the case of both Yield-SIE and Shift SIE ($F(1, 164) = 0.32, p = .571, \eta^2 < .01$ and $F(1, 164) = 0.16, p = .687, \eta^2 < .01$, respectively), as well as in interaction with the version ($F(1, 164) = 0.65, p = .422, \eta^2 < .01$ and $F(1, 164) = 0.39, p = .536, \eta^2 < .01$). However, RSA was also insignificant in the case of Yield-C and Shift-C (main effects: $F(1, 190) = 0.32, p = .574, \eta^2 < .01$ and $F(1, 190) = 0.17, p = .679, \eta^2 < .01$; interaction with the version: $F(1, 190) = 0.19, p = .664, \eta^2 < .01$ and $F(1, 190) = 0.18, p = .673, \eta^2 < .01$, respectively). In addition, RSA did not influence Yield-DK as the main effect $F(1, 157) = 0.01, p = .948, \eta^2 < .01$ nor in interaction with the version $F(1, 157) = 0.23, p = .631, \eta^2 < .01$. RSA did even increase Shift-DK as the main effect $F(1, 157) = 10.81, p = .001, \eta^2 = .06$, without significant interaction with the version $F(1, 157) = 0.03, p = .874, \eta^2 < .01$. In sum, these results leave Hypotheses 8a and 8b without confirmation.

Discussion of Experiment 2

As in Experiment 1, the results on the Yield were lower in the mild version than in the standard one, which again confirms Hypothesis 1. Also similarly to Experiment 1, the mean Shift was lower in the mild version than in the standard one, confirming Hypothesis 2.

Results concerning memory states closely resembled those from Experiment 1. Mean proportion on Yield-SIE was the highest, next was Yield-DK, and Yield-C was the lowest. Thus, giving in to suggestive questions was the

easiest when participants assumed that information necessary for a given question was included in the original story (while it was only present in the misleading questions). Very importantly, and similarly to results from Experiment 1, Yield-C was far from zero: in about 21% of cases in which discrepancies between false premises included in questions and the real content of the story were detected, answers were still consistent with misinformation.

The pattern of results concerning Shift was also very similar to the results from Experiment 1: changing answers after a negative feedback was most often in the case of Shift-DK, that is, when the participants did not know where relevant information was – in the original story or the questions. Probably, their uncertainty was the highest in this case. Shift-SIE was much lower: when participants believed the information to be included in the story, they probably saw no good reasons to change the answers. Strangely, however (and similarly to the results from Experiment 1), Shift-C was also low and did not differ from Shift-SIE. Thus, when the participants knew that the story did not include information necessary for the answer, changing these answers was also low but still, it was present in about 26% of the cases.

Reinforced self-affirmation was not effective in reducing neither Yield, nor the Shift. Given that the materials and procedures were identical to Experiment 1, in which warning was effective, this result cannot be interpreted in terms of different original materials and different suggestions to be susceptible to immunization in different ways. The lack of significant reduction of interrogative suggestibility by means of RSA is a little bit surprising as this method already proved effective in two experiments using GSS (Szpitalak & Polczyk, 2016, 2020). It should be noted however that in these experiments the effect sizes for RSA were rather low (η^2 between .02-.04). That means that the effects of RSA, even when significant, were rather small. Small effect sizes may not reproduce in every experiment due to the power issues. In fact, the observed power in the present research for RSA was .07 for the Yield and .32 for Shift as the main effect, and .23 and .05 in interaction with the version, respectively. This is rather a low power and the chances to detect a significant effect for RSA were limited.

Notably, RSA was not significantly related to interrogative suggestibility in the context of memory states. In particular, the Hypothesis 8a and 8b stating that RSA will be effective in the case of C but SIE were not confirmed. Therefore, no confirmation was obtained for the assumption that RSA would be particularly effective when the participants are aware of the discrepancies between the original story and the premises included in the questions.

EXPERIMENT 3 – MINDFULNESS

Participants

One hundred and eighty participants were tested (133 women, 47 men; mean age: 26.4 years, $SD = 9.5$). They were recruited from the general population through

advertisements in the mass media and on the Internet. They were paid 30 PLN (about 8 €) for participation.

Tools and Procedure

The procedure and the tools were the same as in Experiments 1 and 2, but instead of warning or RSA, induction of mindfulness was applied. A simplified version of the procedure described by Djikic et al. (2008) was used. In the high mindfulness group, the participants were sorting photographs of people four times, based on the looking of the people on the photographs, according to four self-generated categories (e.g. warmth, intelligence, aggression and so on). In the control low-mindfulness group, the participants were sorting the photographs according to one category assigned by the experimenter. The remaining procedure was the same as in Experiments 1 and 2.

RESULTS

As in the previous experiments, at first differences between the mild and standard versions of the GSS were analyzed. Again, suggestibility was lower (see Table 3) in

the case of the mild version, compared to the strong one: for Yield: $F(1, 176) = 36.10, p < .001, \eta^2 = .$, and Shift: $F(1, 176) = 4.49, p = .036, \eta^2 = .02$. Hypotheses 1 and 2 were again confirmed.

Turning to the memory states, Yield-SIE, Yield-C, and Yield-DK differed significantly, $F_{GG}(1.81, 240.90) = 202.66, p < .001, \eta^2 = .61$. Yield-SIE was higher than Yield-C and Yield-DK, whereas Yield-C was lower than Yield-DK, all $ps < .001$. Again, correctly identifying the source of misinformation did not fully protect against it: in 28% of cases, the participants still yielded to misleading cues. Hypothesis 3 was again confirmed.

Shift-SIE, Shift-C, and Shift-DK differed significantly as well, $F_{GG}(1.90, 252.05) = 29.71, p < .001, \eta^2 = .18$. The results for Shift-SIE were lower than for Shift-DK ($p < .001$), while Shift-DK was higher than Shift-C ($p < .001$). Shift-SIE and Shift-C did not differ significantly ($p = .564$). In about 22% of cases in which the participants knew that there was no relevant information in the story, they still changed their answers after negative feedback. Hypothesis 4 was confirmed partially.

Table 3. Means and Standard Deviations for the Standard and Mild Versions in the Groups With and Without Mindfulness for All Dependent Variables

		No Mindfulness		Mindfulness		Total		No Mind.	Mind.	Total
		M	SD	M	SD	M	SD	<i>n</i>	<i>n</i>	<i>n</i>
Yield	Mild	3.80	3.84	3.82	2.13	2.58	2.35	46	45	91
	Standard	6.32	6.60	6.47	3.49	3.38	3.41	41	48	89
	Total	4.99	5.27	5.13	3.10	3.31	3.20	87	93	180
Shift	Mild	4.07	2.27	3.82	2.47	3.95	2.36	46	45	91
	Standard	4.59	3.03	4.94	2.55	4.78	2.77	41	48	89
	Total	4.31	2.66	4.40	2.56	4.36	2.60	87	93	180
Yield SIE	Mild	0.80	0.26	0.87	0.24	0.83	0.25	42	42	84
	Standard	0.89	0.15	0.87	0.29	0.88	0.24	37	47	84
	Total	0.84	0.22	0.87	0.26	0.86	0.24	79	89	168
Yield C	Mild	0.11	0.16	0.12	0.16	0.11	0.16	46	45	91
	Standard	0.28	0.27	0.29	0.27	0.28	0.27	39	47	86
	Total	0.19	0.23	0.21	0.24	0.20	0.23	85	92	177
Yield DK	Mild	0.26	0.30	0.39	0.39	0.32	0.35	39	36	75
	Standard	0.38	0.39	0.40	0.35	0.39	0.37	30	41	71
	Total	0.31	0.35	0.40	0.37	0.36	0.36	69	77	146
Shift SIE	Mild	0.24	0.30	0.14	0.23	0.19	0.27	42	42	84
	Standard	0.19	0.21	0.24	0.34	0.22	0.29	37	47	84
	Total	0.21	0.26	0.19	0.30	0.20	0.28	79	89	168
Shift C	Mild	0.17	0.17	0.17	0.18	0.17	0.17	46	45	91
	Standard	0.25	0.23	0.29	0.26	0.27	0.24	39	47	86
	Total	0.21	0.20	0.23	0.23	0.22	0.22	85	92	177
Shift DK	Mild	0.48	0.34	0.40	0.36	0.44	0.35	39	36	75
	Standard	0.38	0.35	0.48	0.38	0.44	0.37	30	41	71
	Total	0.44	0.34	0.45	0.37	0.44	0.36	69	77	146

Next, the efficiency of inducing mindfulness as a method for reducing interrogative suggestibility was analyzed. It turned out that mindfulness was not statistically significantly effective. In the case of Yield, the results calculated as the main effect and interaction with the version were: $F(1, 176) = 0.14, p = .710, \eta^2 < .01$ and $F(1, 176) = 0.08, p = .779, \eta^2 < .01$, respectively. For Shift the results were nonsignificant as well: $F(1, 176) = 0.02, p = .888, \eta^2 < .001$ and $F(1, 176) = 0.59, p = .442, \eta^2 < .01$. Hypotheses 9a and 9b were not confirmed.

Finally, the impact of mindfulness on interrogative suggestibility in the context of memory states was analyzed. As in Experiment 2, such analyses were performed despite the lack of a significant impact of mindfulness on Yield and Shift as it is still possible that mindfulness is only effective in the case of some memory states. It turned out that it was not. For Yield-SIE, Yield-C, and Yield-DK the main effects of mindfulness were not significant: $F(1, 164) = 0.48, p = .490, \eta^2 < .01$; $F(1, 173) = 0.15, p = .699, \eta^2 < .01$, and $F(1, 142) = 1.73, p = .190, \eta^2 = .01$, respectively. The effect of mindfulness in interaction were not significant, too: $F(1, 164) = 1.76, p = .187, \eta^2 = .01$, $F(1, 173) < 0.01, p = .979, \eta^2 < .01$, and $F(1, 142) = 0.83, p = .363, \eta^2 = .01$, respectively. For Shift, the results for the three memory states were: $F(1, 164) = 0.25, p = .618, \eta^2 < .01$, $F(1, 173) = 0.44, p = .510, \eta^2 < .01$, and $F(1, 142) = 2.31, p = .131, \eta^2 = .02$ as the main effect, and: $F(1, 164) = 2.76, p = .099, \eta^2 = .02$, $F(1, 173) = 0.54, p = .463, \eta^2 < .01$, and $F(1, 142) = 2.31, p = .131, \eta^2 = .02$ in interaction with the version, respectively. Hypotheses 10a and 10b were not confirmed.

Discussion of Experiment 3

The results concerning the comparison between the standard and mild versions of the GSS were the same as in Experiments 1 and 2: both Yield and Shift were lower in the latter one. This confirms that the mild version indeed exerts weaker suggestive influence, and this applies to changing answers after negative feedback as well, although the delivery of this feedback was the same in both versions.

General results concerning memory states were also identical as in Experiments 1 and 2: Yield-SIE was the highest, Yield-DK was lower than Yield-SIE, and Yield-C was the lowest. But still, in about 28% of the cases, the answers were consistent with misleading cues despite the fact that the participants realized that no relevant information was present in the story. As for the Shift, it was the highest in the DK condition than SIE and C, and the two latter ones did not differ. Again, detecting discrepancies by no means guaranteed no changing of the answers, in contrast, shifting was present in this condition in about 22% of cases.

The induction of mindfulness was unsuccessful: it had no impact neither on Yield nor Shift, in any of the memory states. Thus, trying to enhance the participants' attention and their 'being here' did not help them to resist the misleading cues included in suggestive questions, nor did

it help to change answers less after negative feedback. Importantly, no support was obtained for Hypothesis 10a and 10b stating that mindfulness will be particularly useful in cases in which the participants detected discrepancies between the content of the story and the misleading questions: in this condition the influence of mindfulness was equally nonsignificant as in the SIE condition in which the participants thought that the story did contain useful information.

ANALYSES OF CORRELATIONS

Participants

Data provided by participants taking part in Experiments 1, 2, and 3 were used. Results from the three experiments were pooled together. Only results from the standard version of the GSS 2, and only from groups without a given method for reducing IS were included. This resulted in a sample of 145 participants, 99 women and 46 men, with a mean age of 27.1 years ($SD = 9.6$, range: 18 – 66).

Tools

Interrogative suggestibility:

Gudjonsson Suggestibility Scale 2 (GSS 2) described above – standard version (GSS 2).

Tools for measuring influenceability:

Measure of Susceptibility to Social Influence (MSSI; Bobier, 2002; Polish adaptation: Polczyk, 2007). It is a 34-item tool designed to assess three possible responses to social influence pressure: independence (Principled Autonomy), conformity/compliance (Social Adaptability), and anticonformity (Social Friction). The questions are answered on a 5 point Likert scale, from "strongly disagree" to "strongly agree". Internal consistency (Cronbach alphas) for the three dimensions was: .79, .85, and .59, respectively.

Gudjonsson Compliance Scale (GCS, Gudjonsson, 1997; Polish adaptation: Wilk, 2004) was designed to measure compliance, defined as the tendency to conform to requests made by others, particularly people in authority, in order to please them or to avoid conflict and confrontation. It consists of 20 statements answered true or false, e.g. "I give in easily when I am pressured". Its internal consistency was .95.

Tools for measuring negative emotionality and anxiety:

NEO Five-Factor Inventory (NEO-FFI, Costa & McCrae, 1992; Polish adaptation: Zawadzki et al., 1995). This is a questionnaire that measures five aspects of personality: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. The neuroticism scale served as a measure of negative emotionality. The remaining traits were used for exploratory reasons. The Cronbach alphas for the five dimensions were: .82, .79, .71, .72, and .84, respectively.

State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983; Polish adaptation: Spielberger, Strelau, Tysarczyk & Wrześniewski (1996) is a measure of trait and state anxiety; each scale includes

20 questions. In the present research the state subscale was used; its internal consistency was .94.

Tools for measuring self-esteem:

Rosenberg Self-Esteem Scale (SES; Rosenberg, 1965; Polish adaptation: Dzwonkowska, Lachowicz-Tabaczek & Łaguna, 2008) is a 10-item questionnaire for measuring self-esteem; Cronbach's alpha for it was .87.

Self-Liking – Self-Competence Scale – Revised (SLCS-R; Tafarodi & Swann, 2001; Polish adaptation: Szpitalak & Polczyk, 2015b). This is a 16-item questionnaire designed to measure two dimensions of self-esteem: self-competence and self-liking. The Cronbach alphas for both dimensions were .89 and .77.

Subjective appraisal of memory:

Memory Assessment Clinics Self-Rating Scale (MAC-S; Crook & Larrabee, 1990; Polish translation: Mikołaj Skwierawski, unpublished manuscript). This is a self-rating "paper-and-pencil" memory questionnaire assessing failures of memory in everyday life. It consists of 21 ability-to-remember items, and 24 items assessing frequency of occurrence of memory failures. There are also four global rating items which assess overall comparison to others, comparison to the best one's memory has ever been, speed of recall, and concern or worry over memory function. In the present research it was used as an additional tool to assess subjective memory ability. In the present research Cronbach's alpha for this tool was .92.

Procedure

The tools were administered during the 50-minutes break in the GSS procedure, in random order, in Experiments 1, 2, and 3. In case a participant completed all the tools in less than 50 minutes, they were given some other questionnaires as fillers.

The only effect of gender was higher Yield-DK in the case of women than in men (given the coding of gender: 1: woman; 2: man). Age was negatively correlated with Shift-C. Both Yield and Shift were negatively related to memory scores. Yield was *positively* correlated with self-appraisal of memory. Shift was negatively related to the 'Autonomy' dimension from the MSSSI, and positively to Social Adaptability from this tool. Yield-SIE and Yield-C, as well as Shift-C were negatively related to memory scores. Shift-SIE was positively correlated with self-appraisal of memory, extraversion, social friction, and self-liking; it was also negatively related to agreeableness. Finally, Shift-C was positively related to social adaptability.

DISCUSSION OF THE ANALYSES OF CORRELATIONS

Gender was not related to any of the main indices of IS, which replicates existing data, described above in the Introduction (Gudjonsson et al., 2016; Pollard et al., 2004; Roma et al., 2011; Zangrossi et al., 2020). The correlation with Yield-DK may indicate that women are more prone to

Table 4. Pearson r Correlations Between Interrogative Suggestibility and Personality Traits

	Yield	Shift	Yield SIE	Yield C	Yield DK	Shift SIE	Shift C	Shift DK
Gender ¹	.02	-.03	.08	.02	-.37*	-.05	.01	-.10
Age	.04	-.06	-.08	-.07	-.13	.03	-.18*	.17
Recall 1	-.42**	-.24**	-.19*	-.29**	.11	.11	-.21*	-.02
Recall 2	-.41**	-.30**	-.14	-.30**	.08	.01	-.24**	-.05
Self-appraisal of memory	.20*	.04	-.10	.15	-.03	.20*	.06	.03
Neuroticism	-.03	.10	.16	.00	.01	-.13	.06	.08
Extraversion	.13	.01	-.18	.06	.10	.20*	.06	.03
Openness	-.05	-.04	-.04	-.04	-.01	.10	-.09	.11
Agreeableness	-.04	-.10	.00	-.02	.10	-.20*	-.04	-.08
Conscientiousness	.06	-.05	-.16	-.01	-.03	.13	-.05	-.03
Anxiety	.06	.08	.13	.09	.02	-.09	.02	.05
Compliance	.04	.03	.11	.01	.08	-.15	.09	-.13
Principled Autonomy	-.09	-.18*	-.12	-.11	-.14	.14	-.15	-.09
Social Adaptation	.06	.21*	.14	.11	.16	-.08	.23**	.00
Social Friction	.01	.04	-.12	.00	.04	.28**	.01	.03
Self-esteem	.03	-.06	-.12	.01	-.02	.13	-.01	-.07
Self-liking	.00	-.08	-.13	-.01	-.10	.18*	-.02	-.11
Self-confidence	.05	-.08	-.05	-.03	.00	.02	-.05	-.03

¹ Point biserial correlations

* : p < 0,05

** : p < 0,01

rely on suggestive questions when they do not know where the relevant information was. Age was also related neither to Yield nor Shift. This does not contradict existing data, described above because they only indicate that adults are less suggestive than children (and less suggestible than elderly persons; Biondi et al., 2020; Dukała & Polczyk, 2013; Frumkin et al., 2012; Danielsdottir et al., 1993; Gudjonsson et al., 2016; Lee, 2004; Polczyk et al., 2004; Zangrossi, 2020) but not correlations of age within the group of healthy adults. The only correlation for age in the present study indicates that the older a person is, the less likely they are to change answers when they are aware of the discrepancies between the story and the questions.

Hypotheses 11a and 11c, postulating relationships between personality traits and IS, and stronger correlations for Shift than Yield, were not supported, apart perhaps from the positive correlation of Shift with Social Adaptation and negative with Principled Autonomy. Hypothesis 11b stating that memory of the story would be more related to Yield than Shift was somehow supported - the correlations were indeed slightly higher for Yield than Shift.

However, the important Hypotheses 12a and 12b gained no consistent support - Yield-C was related to both Recall 1 and 2, contrary to the hypothesis. Shift-SIE was not related to memory at all, while Shift-C was negatively related to it.

Also, traits connected with susceptibility to influence were not related more to Yield-C and Shift-C than Yield-SIE or Shift-SIE. Just one result was consistent with the hypothesis: the positive correlation between Shift-C and Social Adaptability. But there was also a positive correlation of Shift-SIE with Social Friction which was unexpected. Also, Yield-C was not correlated with any of the individual traits.

GENERAL DISCUSSION

The aims of the present study were fourfold. First, to compare the standard and mild versions of the GSS 2. Second, to analyze IS in the context of memory states, in particular, to analyze the impact of discrepancy detection between the original story and suggestive questions on IS. Third, to explore three methods for reducing IE: warning, increasing self-confidence, and inducing mindfulness. Fourth, to analyze a set of individual traits as possible correlates of IS.

In all three experiments, the mild version of GSS resulted in lower yielding to suggestions. This replicates the results presented by Polczyk et al. (2024). It is worth noting, however, that the decrease of Yield and Shift was rather modest: it was about 2,5 for Yield (on a scale from 0 to 15) and even less in the case of Shift (on a scale from 0 to 20). This is somewhat surprising given that the mild version differed considerably from the standard one. Gudjonsson (1984) distinguished among three kinds of suggestive questions included in the GSS (each comprising five items): false alternatives (e.g. 'Were the assailants tall or short?'), leading questions (e.g. 'Did the woman's

glasses break in the struggle?') and affirmative questions (e.g. 'Was the woman taken to the central police station?'). False alternatives seemed to be the most effective in exerting suggestion (Gudjonsson, 1984). In the mild version there were no false alternatives at all, and other questions were softened. Despite this, the decrease of suggestibility was rather modest. This may mean that people prone to suggestions accept them even if they are mild. This is yet another warning for the justice system.

In all three experiments there was a similar and consistent impact of memory states on Yield: it was the highest when the participants wrongly ascribed the suggestion to the original story, that is, they thought that information necessary for answering a given question was present in the story (the SIE condition). Yield was lower when the participants did not know where the relevant information was (the DK condition), and it was the lowest when the participants knew that the story did not contain a given piece of information (the C condition). Higher Yield-SIE than Yield-DK and Yield-C was also obtained by Polczyk et al. (2024) although in their experiment Yield-DK and Yield-C did not differ.

Lower suggestibility in the case when there was discrepancy detection between the original and postevent materials is a phenomenon well known in the three-stage memory misinformation effect (Schooler & Loftus, 1986; Tousignant & Loftus, 1986). However, it is equally well known that discrepancy detection in this paradigm by no means reduces the misinformation effect to null; in contrast, substantial amounts of participants still give answers consistent with misinformation even if they know that the original and postevent materials differed as regards the critical questions (Blank, 1998; Higham et al., 2017; Kękuś et al., 2024; Polczyk, 2017; Szpitalak & Polczyk, 2015a). It seems that the same is the case with IS. In the present research, the percentage of cases in which suggestible answers were given in the 'C' condition was from 10% to 28%, and in the research by Polczyk et al. (2024) it was even 34%.

These results contradict Gudjonsson's assertion that 'failure in discrepancy detection is a necessary but not sufficient condition for people to yield to suggestions' (Gudjonsson, 2003, p. 356). Instead, our results suggest that compliance with suggestions is possible even if the participants have detected discrepancies between the story and suggestive questions.

Why would anyone answer in accordance with misinformation, no matter its source and modus of delivery, when they remember otherwise? The present research does not address this question directly in any way. Its primary aim was to just demonstrate that this is possible and far from being something exceptional. However, a good candidate for an explanation may be the hypothesis that it is the lack of confidence in one's memory which drives people to rely on external sources of information. After all, memory failures of various kinds are an everyday experience for many people. It is therefore possible that when struggling with experiments involving misinformation, when one remembers otherwise than the external

source suggests, one may think that their own memory failed. Again, in the case of the three-stage misinformation paradigm it was repeatedly demonstrated that lack of confidence in one's memory is the main cause for yielding to misinformation (e.g. Blank, 1998; Kękuś et al., 2024; Polczyk, 2017). In contrast, Dudek and Polczyk (2024) found no evidence that memory distrust is related to neither the misinformation paradigm, nor interrogative suggestibility. Anyway, exploring the lack of confidence in this area seems to be a promising research avenue.

Things looked different in the case of Shift. In all three experiments, Shift-DK was higher than both Shift-SIE and Shift-C, whereas the latter two did not differ significantly. This makes logical sense and is partially congruent with the hypotheses. When the participants did not know where the relevant information was, their uncertainty as to the quality of their answer may be the highest, so they willingly changed the answers upon hearing that they had made a lot of mistakes. However, we also hypothesized that changing the answers will be high in the cases in which the participants knew that relevant information was not in the story, so they knew that they were relying on questions rather, not the story. This was not the case: Shift-SIE and Shift-C did not differ significantly. The low rate of changes in the case of Shift-SIE is understandable: when the participants believed that information was present in the story, they probably also believed that they answered correctly, so there was no need to change the answer. It is however not clear why the participants were equally unwilling to change answers when they knew that relative information was not in the story. The word 'knew' may be of key importance to interpret this result. All we know from the Source Identification Questionnaire is that the participant chose the answer 'not in the story'. Why they did so, is still not quite clear. The participant may have been more certain of this answer, or less. Tulving (1985) introduced the remember-know distinction in the context of memory reports. To remember something means to have a vivid recollection of it. To just know that something was present means that someone 'knows' that it took place without having a clear recollection of it. 'To know' something is much closer to 'believe' that something was present. It is possible that even if a participant believed that a given detail was not mentioned in the story, they still were often not sure enough of this to change their answers.

In the present research three methods of reducing IS were investigated: warning against suggestive cues, boosting self-confidence by means of reinforced self-affirmation, and inducing mindfulness. Warning proved generally effective both in the case of Yield and Shift. This replicates existing results (Bain et al., 2004; Baxter et al., 2006; Boon and Baxter, 2000). Interestingly, and according to the hypotheses, warning did not significantly reduce IS when participants thought that relevant information was included in the story (Yield-SIE and Shift-SIE), but was effective when they realized that the story did not mention a given detail suggested by the question. This is logical because when one is not aware of any discrepancies between the

sources of information, one simply cannot make use of the warning – it is not known what to beware of.

In sum, the results clearly indicate that warning is not effective in the case of source monitoring errors. Similar results were obtained in the three-stage misinformation paradigm (Blank, 1998; Higham et al., 2017; Polczyk, 2017). This is an important information for future efforts to develop methods for reducing vulnerability to suggestions. Ideally, they should include techniques designed for both situations: when a person does and does not realize that they saw/heard one thing, and other sources said otherwise.

In contrast to warning, enhancing self-esteem by means of RSA was not effective. Unfortunately, in the present research no manipulation check for RSA was applied (due to the relative complexity of the procedure), so it is not clear whether no enhancement of self-esteem took place, or whether RSA was successful in this but enhanced self-esteem did not result in reducing IS. It is also possible that an increase in self-esteem was present, but it was not strong enough to produce the expected effects. In existing research, manipulation checks for the RSA were usually successful (Szpitalak, 2022; Szpitalak & Polczyk, 2019a, b; 2020, 2021) but not always (Kękuś et al., 2023), so its efficacy in enhancing self-efficacy cannot be taken for granted.

In any case, the lack of efficacy of RSA in reducing IS is somewhat surprising given that in existing research it did diminish it (Szpitalak & Polczyk, 2016, 2020). The simplest explanation may be the fact that, as mentioned above in the discussion of the results of Experiment 2, even if RSA successfully reduced IS, the effect sizes were small. Such small effects may not reproduce in every experiment. Nevertheless, the exact reasons for the lack of impact of RSA on IS in the present experiment must remain unknown.

The third method explored in the present study, induction of mindfulness was ineffective, too: there were no significant differences in any of the indices connected with IS between the experimental and the control group. Again, without a proper manipulation check it is unfortunately difficult to interpret this result.

However, it is worth mentioning an important difference between the manipulation of warning, and RSA and mindfulness. The first one was relatively simple and simply involved the participants reading four sentences. RSA and mindfulness, on the other hand, were more complicated and were applied at the end of the 50-minute break filled with completing questionnaires. The participants may simply have been tired. Fatigue may have resulted in less effectiveness of RSA and mindfulness manipulation, and thus in their lack of effectiveness.

As for the correlational analyses, the only consistent result (and similar to results reported in the literature, as elaborated in the Introduction) was the negative relationship of the memory of the story with general yielding to suggestions and changing answers. In this context it is however rather strange that self-evaluated memory correlated *positively* with Yield. In virtually all research we

know and mentioned in this paper memory correlated negatively with IS. To better understand this result, we computed correlations of the result on MAC with the memory indices Recall 1 and Recall 2 and it turned out that the relationships were not significant ($r_s .04$ and $-.01$, respectively; $p > .05$). This simply means that MAC is probably invalid as a test of memory, and without knowing what it actually measures, it is difficult to understand its correlation with Yield.

Analyzing the correlations of memory of the story as measured by the indices Recall 1 and 2 with suggestibility in the context of memory states, no support was found for Hypotheses 12a and 12b stating that memory quality would be related to yielding to misleading cues and changing answers after negative feedback in the situation in which memory failures were present – in the form of failed source monitoring. The second part of this hypothesis stated that memory quality would not be related to suggestibility in the situation in which discrepancies between the original story and information suggested by misleading questions were correctly detected because in this case memory confidence is more important. Actually, the pattern of results was reversed: Yield-C and Shift-C seemed to be more related (negatively) to memory quality than Yield-SIE and Shift-SIE. One possible interpretation of these results may still be based on the notion of memory confidence. Namely, it is possible that if a participant remembered the story well, and believed that a given detail was not mentioned in the story, the good memory helped them to be confident in this memory, and therefore reject the information contained in the question. Similarly, confidence in one's memory stemming from actual good memory may help to resist the urge to change an answer after negative feedback.

In the analyses involving personality traits: the big five dimensions, anxiety, compliance, susceptibility to influence, and self-esteem, and the general IS aspects: Yield and Shift, out of 26 correlations computed only two were statistically significant: a negative correlation of Shift with Principled Autonomy and a positive one with Social Adaptability. They were consistent with Hypothesis 11c, but nevertheless they were only two. In sum, little evidence was found for the existence of relationship between personality traits (especially anxiety and self-esteem) with IS. These results are not inconsistent with those reported in the literature, in which the majority of studies did not find significant correlations. Of more importance is the failure to confirm Hypotheses 12a and 12b which postulated that traits such as neuroticism, anxiety, compliance, susceptibility to influence, and self-esteem should be related more to IS when discrepancies between the story and the questions were detected than when they were not. As for the Yield, no correlations with personality traits were found at all, in any of the memory states (SIE, C, or DK). Shift-C correlated positively with Social Adaptability, as predicted, but this was the only significant correlate. Shift-SIE was positively related to Social Adaptability and self-liking; these effects were not expected and may be due to chance.

Limitations and Future Directions

In the present study, the mild version consisted of replacing questions from the original version with questions containing milder suggestions. The feedback remained the same; we only focused on mild versions of leading questions, not on negative feedback. However, future research should explore mild negative feedback too. This could be more ecologically valid since openly criticizing testimony quality is generally frowned upon in real-life situations.

The internal consistency of Yield and Shift in the mild version was somewhat low, so caution is advised in interpreting the results concerning it.

Lack of manipulation checks for RSA and inducing mindfulness was a problem in this study, which made it difficult to interpret nonsignificant results. Manipulation checks were omitted because the procedure was already overloaded with tools. In future research it is however advisable to apply them. It should be emphasized that self-esteem can be considered on various dimensions, the most basic of which are height and stability (e.g. Kernis et al., 1993), and adequacy (e.g. Baumeister et al., 1993). In addition, an important construct related to self-esteem is self-confidence (e.g. Oney & Oksuzoglu-Guven, 2015). It is currently unknown which of these dimensions is influenced by RSA. Most likely, RSA influences the height of self-esteem or self-confidence but currently this remains unclear.

In Experiment 3 we tried to induce mindfulness, therefore referring to it as a state. Mindfulness can also be conceptualized and measured as a trait (e.g. with the Langer Mindfulness Scale; Pirson et al., 2018). In future research it is worth taking into account this perspective as well.

It should be stressed that SIQ is a purely declarative tool. It cannot be ruled out that some participants were guessing on it and guessed correctly (i.e. they indicated that relevant information was only included in the questions). This is possible (even if the “don't know” answer was available) if some of the participants have assumed that if someone was asking them, the information was probably in the text or question.

In future research it may be interesting to manipulate the place of SIQ. If it was placed *before* the first set of questions, it may even serve as a method for reducing IS: when the participants were made aware that information may be contained either in the text or in the questions (or perhaps in both places), it is possible that they would scrutinize their memory more carefully and yield to misleading cues to a lesser degree.

In the present research, the correlational analyses yielded mostly statistically insignificant results. In the literature they were mixed. Metaanalyses for the correlates of IS should be performed in order to get a better insight in the topic of personality traits related to suggestibility.

Bain et al. (2007) presented research which may be related to the present one: they found that high self-monitoring is related to IS. It may be interesting to analyze self-monitoring in the context of memory states and IS.

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