Original Papers	

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Sensory processing sensitivity and its relation to susceptibility to misinformation

Abstract: Sensory processing sensitivity is a relatively new theoretical construct. Its main components include deeper processing of stimuli as well as a stronger response to environmental impacts, both positive and negative. The effect of misinformation, which involves the inclusion of misinformation in the witness's memory reports, can be modified by varied factors, including personality characteristics. To the knowledge of the authors, no such research has been conducted so far and thereby the aim of the following study was to examine the relationship between the sensory processing sensitivity and susceptibility to the misinformation effect. Group studies were carried out according to the three-stage scheme of investigating the misinformation effect. After the original material was presented, the participants were exposed to a post-event material, containing the misinformation in the experimental group. Then the memory of the original material was tested. A strong misinformation effect was shown. Highly sensitive people, achieving the highest results in the Highly Sensitive Person Scale, were more resistant to the misinformation effect.

Keywords: *high sensitivity, sensory processing sensitivity, personality trait, misinformation effect, suggestibility, eyewitness testimony*

INTRODUCTION

Misinformation effect

Misinformation can be defined as any information presented before, during or after presentation of the original information that is either inconsistent with the original information or not included in the original material at all (Polczyk, 2007). It is such a common phenomenon that practically everyone comes across it in everyday life. A survey commissioned by the European Commission revealed that almost half (48%) of Poles deal every day or almost every day with so-called *fake news* (Chyliński, 2018). The effect of misinformation is a frequent consequence of exposure to misinformation. It is a phenomenon consisting in the inclusion of information in the witness's memory reports which have not been acquired as a result of contact with a given event, but from sources other than this event (Polczyk, 2007).

The experiments on the misinformation effect are most commonly conducted using the traditional three-stage procedure (Loftus, Miller, Burns, 1978). In the first phase participants become familiar with the original material in the form of a movie fragment, slides, a staged event, voice record or alternatively in a text form

(examples of such research can be found e.g. in Polczyk, 2007; Szpitalak, Dukała, Polczyk, 2013). The original material in non-laboratory situations is an equivalent of a specific event, e.g. a crime, an accident, etc. After some time (ranging from a few minutes to several days), the subjects become acquainted with the follow-up material, containing misinformation in the experimental groups (Loftus et al., 1978). Subsequently, the participants of the study are asked to provide answers in the final test of the memory of the original material, which also includes questions about previously misled elements (something referred to as *critical questions*). Factors which modify susceptibility to misinformation can be divided into three classes: the first concerns cognitive processes, the second is the misinformation nature of the remembered material, and the third is related to the personal characteristics of an individual who perceives an event and is subsequently exposed to misinformation (Lindberg, 1991; Zhu et al., 2010a; Zhu et al., 2010b). In addition, Polczyk (2007) indicates factors which are the results of the experimental manipulation. The hereby research concerns the personality factor. Studies on the misinformation effect are mainly conducted in the field of forensic psychology (Loftus, 2005) and have practical implications for the area

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of witness testimony in the context of interrogations. It should be stressed here that eyewitness testimonies remain the key evidence in judicial decisions and sometimes testimony made by an event witness is the only way to establish the truth (Wojciechowski, 2015). Apart from the forensic context, mention must be made of the ability to recognize omnipresent fake news. To the authors' knowledge, no research has been conducted so far to examine the relationship between the sensitivity of sensory processing (*SPS*) and susceptibility to misinformation[1], and due to the fact that SPS itself is a relatively new construct and the research on it is still in progress (e.g. Aron, Aron, Jagiellowicz, 2012; Greven et al., 2019), an attempt has been made to fill the existing knowledge gap.

Sensory processing sensitivity

Sensory processing sensitivity (SPS) is a theoretical construct consisting of deeper processing of stimuli and an increased response to both positive and negative environmental influences (Aron, Aron, 1997). As a largely biologically determined trait, sensitivity is not only a typically human domain - it has so far been found in over a hundred different species (Wolf, Van Doorn, & Weissing, 2008).

Elaine N. Aron (2017) developed the *DOES* acronym, which allows to capture the key aspects of behaviour for high-sensitivity. *D* stands for the already mentioned *depth of information processing*. It is mainly related to cognitive activity, but it is also reflected in the over-reactivity of the immune system and a stronger reaction to pain, hunger or caffeine (Aron, Aron, 1997).

O in the acronym refers to *overstimulation*. Highly sensitive people have particularly sensitive nervous systems, which results in a tendency of reaching the stimulation threshold faster and feeling overwhelmed (Pluess, Belsky, 2013). It is also associated with increased susceptibility to stress (van de Wiel, van Goozen, Matthys, Snoeck, and van Engeland, 2004) and weaker mental health (Benham, 2006). The next letter – *E* – stands for *emotional reactivity*. Sensitive people tend to react more strongly to both positive and negative experiences. Pluess and Belsky (2013) developed the concept of *vantage sensitivity*, emphasizing the specific potential of vulnerable people to benefit from positive events, circumstances or interventions. *E* can also stand for *empathy*. In addition, sensitive people are more aware of other people's moods (Aron et al, 2010). The last part of the acronym is the letter *S - sensing the subtle*. This refers to noticing nuances that others miss. However, this feature does not apply to the extraordinary acuity of the senses, but rather to more careful processing of sensory information (Gerstenberg, 2012).

It is difficult to determine the exact percent of highly sensitive people in the human population. The test measurement indicates a value between 15-30%, however this number may be imprecisely estimated (Aron, 2017, Greven et al, 2019). There are as many boys as girls born

with this personality trait, but men usually score lower on the HSP (Highly Sensitive Person) Scale (*ibidem*). It should be stressed that according to the original theory, high sensitivity is a dichotomous category, not a dimension – therefore the individual can be either sensitive or not (*ibidem*). However, results of the latest research suggest the presence of a third, middle group of moderately sensitive persons, who would constitute the majority of society (Lionetti et al., 2018).

The interesting matter is a relation between SPS and personality traits such as the Big Five traits of Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness (McCrae, Costa, 1997). Meta-analyses conducted by Lionetti et al. (2019) confirm the basic fact that SPS is relatively distinct from other common personality traits. Sensory Processing Sensitivity, measured by Highly Sensitive Person Scale is to certain extent associated with some of Big Five traits. Most frequently SPS has been reported to correlate positively with Neuroticism, Introversion and Openness to New Experience (Greven et al, 2019; Ahadi, Basharpoor, 2010; Listou Grimen, Diseth, 2016; Sobocko, Zelenski, 2015), while Agreeableness and Conscientiousness are usually not related to SPS and its facets (Lionetti et al., 2019; few exceptions – Greven et al, 2019). The strongest and most consistent associations can be observed for Neuroticism (Lionetti et al., 2019).

Around the same time when Aron and Aron (1997) published the article about the Sensory Processing Sensitivity theory, the Regulatory Theory of Temperament (RTT) was developed by Strelau and Zawadzki (1993, 1997). According to this theory, the structure of temperament is determined by two aspects: energetic and temporal. The temporal factor has been further divided into Briskness and Perseverance and the energetic characteristics of behaviour are Sensory Sensitivity, Emotional Reactivity, Endurance, and Activity. The following two aspects of RTT appear to be closest to the SPS theory: Sensory Sensitivity, defined as the ability to react to sensory stimuli with a low stimulus value, and Emotional Reactivity, the tendency of intensive reactions to emotional triggering stimuli (Zawadzki, Strelau, 1997). However, while in the SPS theory, the sensitivity of sensory processing is treated as a fundamental property of the nervous system, and is a complex construct with a strong component of affective reactivity, in the RTT concept, sensory sensitivity is defined at a more elementary level of sensory response, without an emotional component (Kantor-Martynuska, 2012). Kantor-Martynuska (2012) indicates that emotional reactivity in Strelau, Zawadzki (1997)'s understanding may be responsible for the feeling of being overwhelmed by the world and the ease of achieving arousal, often quoted by Aron (2018). However, despite several similarities these concepts are fundamentally different from each other.

What also needs to be underlined is the fact that awareness of the individual's level of sensitivity is applicable to the various spheres of life: medical treatment, selection of educational methods or proper job choice;

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[1] As of May 2021

moreover the level of sensitivity also influences psychological properties as the level of self-esteem (often reduced by a sense of otherness, mismatching; Aron et al., 2012).

Relationship between sensitivity and susceptibility to misinformation

As it has been mentioned previously, sensory processing sensitivity is a complex theoretical construct (Aron et al, 2012). For this reason, any predictions about the direction of the relationship are not easy to make and will be based on the previous experiments involving certain components of the sensory processing sensitivity or characteristics associated with it.

Previous studies on temperament and source personality traits, and also the related variability in attention functioning, strength of emotional reactivity or the way of functioning in social situations do not bring unequivocal results in the context of susceptibility to misinformation (Bruck, Melnyk, 2004). Some analyses suggest that people with a low level of extraversion are more susceptible to the influence of suggestion (Porter, Birt, Yuille, & Lehman, 2000), which could predispose some sensitive people to be more susceptible to misinformation - assuming that among the highly sensitive 70% are introverts (Aron, 2017). However, it should be noted that there are also more extroverted highly sensitive individuals, and moreover, it is not the only component of sensitivity.

Another personality factor related to sensitivity is neuroticism. In the NEO-PI-R Personality Inventory, created by McCrae and Costa (1997; Polish adaptation - Siuta, 2006), one of the subscales within neuroticism is Hypersensitivity. However, the analysis conducted by Ahadi, Basharpoor (2010) showed that sensory processing sensitivity as measured by the Highly Sensitive Person Scale (HSP) explains only 38% of the total variance of neuroticism. However, neuroticism is associated with increased suggestibility (Gudjonsson, 1983; Liebman et al., 2002). Ahadi and Basharpoor (2010) also presented a positive correlation of openness to experience with the HSP - Aesthetic Sensitivity subscale. The analyses of Liebman et al. (2002) indicated that this personality factor may be also related to the greater suggestibility.

A higher perceived level of stress among the highly sensitive, especially in a task situation, may also modify the suggestibility of an individual. Most studies indicate a negative relationship between stress and misinformation (e.g. Vogel, Schwabe, 2016).

However, it should be emphasized that the above-mentioned features are not definitional components of sensory processing sensitivity, but are only related to it. In order to recognize a person as highly sensitive, all the elements described in the acronym DOES (depth of information processing, overstimulation, emotional reactivity and empathy as well as sensing the subtle; Aron, 2018) must occur. The depth of processing and the perception of subtleties seem to be the most important aspects of sensitivity in the context of the misinformation effect. The deeper processed material is better remembered and more permanent (see Levels of processing theory, Craik and Lockhart, 1972).

On the other hand, detecting details in the observed situation may contribute to more precise descriptions of the event, including those nuances that less sensitive people tend to elude, and which may contribute to the correct identification of the original stimulus. It is therefore possible that the above aspects lead to lower susceptibility to misinformation.

HYPOTHESES

Taking into account the premises, the following research hypotheses were formulated:

1) People from the misinformed group will more often give answers consistent with misinformation in the final memory test, in comparison to people from the control group (*replication of the misinformation effect*).

2) There will be differences in the susceptibility to misinformation between the highly sensitive and the medium/low sensitive individuals.

The aim of the first hypothesis is the replication of the misinformation effect (Loftus, 1979). The second hypothesis is related to the main problem of this work, i.e. the analysis of the suggestive susceptibility of sensitive people, and the differences in this respect between subjects with a high and medium/low level of sensory processing sensitivity.

Justification of research hypotheses

A review of the existing literature reveals a vague picture of potential relations between the sensitivity of sensory processing and susceptibility to misinformation. There are reasons suggesting the possibility of both directions.

Highly sensitive people tend to have low self-esteem (Aron, 2017). In connection with the high expectations they set for themselves and the pursuit of perfection (*ibidem*), as well as with a reduced level of performance quality in a stressful situation (which is undoubtedly an experimental situation, and even more so – the context of an interrogation or court testimony), the assumption about their greater susceptibility to misinformation seems to be justified. The fact of having an extensive, vivid imagination and a high level of creativity, emphasized in the literature (e.g. Sand, 2016), may also affect the credibility of the memories of highly sensitive people in the situation of exposure to erroneous information.

On the other hand, highly sensitive individuals process the incoming information more deeply and are more attentive to details. Their overall cognitive functioning is also better (Aron, 2018), which is known to be crucial for the quality of the eyewitness testimony (Zhu et al., 2010). Higher levels of perceived stress may also have a result in greater resistance to misinformation (Hoscheidt, LaBar, Ryan, Jacobs, & Nadel, 2014).

Thus, the authors of this study refrained from proposing a directional, precise hypothesis and treated the matter as exploratory.

METHOD

Participants

127 participants took part in the experiment. The youngest person examined was 15 years old and the oldest 55 years old; the mean age of the respondents was over 22 years old ($M = 22.39$; $SD = 6.08$). The gender distribution was as follows: 71 of the respondents were women (55.9%), while there were 56 men (44.1%)**.** The research was carried out in a group scheme, and the respondents did not receive any gratification for participation. Recruitment for research took place mainly at schools and universities.

Materials

Highly Sensitive Person Scale (HSP Scale)

The HSP (Highly Sensitive Person) Scale, developed by Aron and Aron (1997), was used to measure the sensitivity. The scale contains 27 items. They refer to reactivity to a variety of internal and external factors, such as sensory stimuli, life changes, art or other people's moods. Subjects must refer to each statement on a 1-7 Likert scale, where 1 means that the item does not refer to them at all, and 7 indicates maximum intensity. Thus, in the entire scale, the respondents can obtain a result in the range of 27 (attributing 1 point to each question) -189 points (giving the maximum 7 points to all 27 items). The Cronbach's alpha coefficient (0.85-0.89) of the original version of the questionnaire (Aron, Aron, 1997; Smolewska et al. 2006) indicates good internal consistency. This scale was conceived as a uniform construct, and the intensity of sensitivity can be checked by summing up the points obtained in response to the questions (a higher score on the scale means a higher sensitivity level).

Due to the lack of a Polish adaptation of the questionnaire, the English version was translated into Polish. Subsequently, the translated items were sent along with the instructions to a translation agency, with a request for a reverse translation into English. After receiving the translation, the whole in the form of a table with the original items and those translated into English from the Polish original translation, were sent by e-mail to the pair of authors of the original HSP Scale – Elaine and Arthur Aron. The permission to use the questionnaire for the research purpose was obtained and after several adjustments recommended by Arthur Aron had been made, the process of preparing the Polish version of the HSP Scale for the study was completed. The reliability of the obtained Polish version of the scale was also analyzed. The Cronbach's alpha coefficient (0.85), exactly the same as in the original version, indicates good internal consistency of the questionnaire. Comprehensive studies to standardize the scale are in progress.

Materials for examining the effect of misinformation

Original material

The original material was an excerpt from a Television Theatre play from 1974 entitled *Three Sisters* (directed by Alexander Bardini, 1974) based on a drama written by Anton Chekhov. The relatively old timing of the production made it possible to assume that the material would not be known to the participants of the study, which reduced the chance of affecting the results of the study. The final fragment of the play, lasting about 8 minutes, was selected for the study. This fragment was chosen because of the relatively dynamic action, also allowing to justify the purpose of the study to the participants (face story). Depending on the situation, the presented material was taken from the website https://ninateka.pl/[2] or played from an own DVD, and was presented to the participants in the Polish language version on the projector screen.

Misinformation in the form of text of the drama

Before selecting a drama for the research, the authors of the hereby study made sure that *Three Sisters* by Chekhov (1983) is not currently a part of the school reading canon. The theatre play used in the study was based on a translation by Bronisław Dąbrowski. Additionally, on the basis of this translation, an excerpt from Chekhov's drama was corrected by ear, thus making sure that all the issues present in the staging were also included in the text.

A blank sheet was attached to the text of the drama with the request to describe one's own emotional experiences from the play - a place for the participant's written statement.

Final memory test

The memory test of the original event consisted of 17 open questions. Seven of these questions were critical (*appendix 1*), i.e. the answer to them could be consistent with the misinformation given in the text of the drama (example question: *Kuligin with a beard looks like a teacher of what subject?).* Misinformation was the change of the original material (e.g. from the German teacher to the Math teacher) in the characters' statements or in didascalie (stage directions) indicating the appearance or behaviour of the characters.

The instructions to the final test emphasized that the answers to the questions should be consistent with the content of the Television Theatre performance, i.e. the respondents should refer to the original material.

PROCEDURE

The studies were conducted according to the three-stage procedure described previously in the article (Loftus et al., 1978). After getting acquainted with the original material, the respondents read the text of the drama, containing misinformation in the experimental groups. Finally, the subjects provided their answers in the final memory test of the original event.

The respondents were informed that the purpose of the study was to evaluate how personality traits influence the perception and memorization of art. The word sensitivity was not used to avoid the potential will of

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respondents to show as highly sensitive individuals. After giving an approval to participate in the research, participants were given an HSP (*Highly Sensitive Person*) questionnaire.

At the top of the sheet with the HSP scale was a space in which the participants entered their nickname, gender and age. They were asked to answer the questions from the questionnaire in line with their own feelings. Moreover, the participants were requested not to skip any question and mark the answer to each one of them due to the results interpretation purposes. Successively, the subjects got acquainted with the displayed fragment of the Television Theatre, which they were asked to carefully watch. Then, the participants were given the texts of the drama, which they had to read, under the excuse of better processing the content of the play and remembering the names of the characters.

About half of the people received the text of the unchanged drama (control group), and the other half, the text with included misinformation. The text of the drama was accompanied by a sheet with an instruction to describe one's own emotional experiences from the play. Due to the respondent's particulars from the top of the page with the description of emotional experiences, it was possible to further verify the affiliation to the particular research group and match the personal data with other sheets. Moreover, the description contributed an additional justification for reading an excerpt from the drama and guaranteed a time interval between exposure to misinformation and the memory test. It was not included in the final analysis. Finally, the subjects completed the conclusive memory test of the original event and were subjected to the *debriefing* procedure. The participants were informed that the purpose of the final memory test was to check how well they remembered the watched play (memorization of art) and how the before measured personality traits influenced the ability to remember. All sheets were collected from the participants on an ongoing basis.

Variables

The aim of the study was to testify whether highly sensitive individuals are more or less susceptible to the misinformation effect than medium/low sensitivity individuals.

A 2 x 2 experimental plan was used in the research with the following factors included:
1) The degree of sensory processing sensitivity, measured by the HSP (Highly Sensitive Person) Scale: high or medium/low.
2) Misinformation: the presence or absence of misinformation.

The dependent variable was the number of responses consistent with misinformation in the memory test (submission to misinformation).

RESULTS

Almost equal distribution of the subjects between the control group (without misinformation, $N = 63$) and the research group (misinformed, $N = 64$) was obtained. The subjects were divided according to the number of points obtained in the HSP scale. The highest obtained score in the hereby research in the HSP Scale was 158 points, and the lowest – 70 points. As mentioned earlier, the authors of the sensory processing sensitivity and the HSP scale (Aron & Aron, 1997) argue that high sensitivity is in fact a dichotomous category, not a dimension – an individual can be either sensitive or not. The authors indicate in *Tips For SPS Research* (Aron, Aron, 2018) that depending on the study, highly sensitive people rank in the highest 15-30% of the HSP results. In line with the above recommendation and similarly as in the other studies in the SPS field (Liss, Timmel, Baxley, and Killingworth, 2005, Greven et al, 2019), the cut-off point was a result of 125 points, dividing the participants into two groups: highly sensitive individuals ($N = 35$, i.e. 27.6% of respondents) and non-highly sensitive ones ($N = 92$, i.e. 72.4%). This divide and cut-off point were based on the theoretical guidelines (Aron, Aron, 2018). Thus, the control group included 45 non-sensitive and 18 highly sensitive subjects. In the experimental condition, 47 non-highly sensitive and 17 highly sensitive people took part.

The final memory test (*appendix 1*) contained seven critical questions, the answers to which were an indicator of occurrence of the misinformation effect. The questions were structured in such a way that they related to the elements being changed in the following text in the misinformed group (misinformation). Only one answer to these questions was in line with the facts from the original event and one in line with misinformation. Thus, when counting the submission to the misinformation of each participant, the answers consistent with the misinformation were summed up, giving each such response a weight of 1 point.

A summary of the descriptive statistics for the number of responses consistent with misinformation in the critical questions has been provided in Table 1.

A two-way ANOVA was performed in an intergroup design: 2 (Misinformation: absent or present) × 2 (Sensitivity: medium/low or high).

The misinformation effect was confirmed ($F(1, 123) = 35.87$; $p < 0.001$; $\eta^2 = 0.23$). This is a strong effect. The main effect for sensitivity was statistically insignificant ($F(1, 123) = 2.92$; $p = 0.09$; $\eta^2 = 0.023$). The interactive effect also was not statistically significant ($F(1, 123) = 2.92$; $p = 0.09$; $\eta^2 = 0.023$).

Despite the fact that the interactive effect did not turn out to be statistically significant, it is justified to carry out multiple comparisons due to the a priori hypotheses aimed at verifying specific groups among themselves (Rosnow, Rosenthal, 1989).

The analysis of planned comparisons showed that both people with lower and higher levels of sensory processing sensitivity were significantly more likely to be misled in the condition with the presence of misinformation ($p < 0.001$ for medium/low sensitivity people and $p = 0.013$ for highly sensitive people). The difference of the means between "sensitive" and "non-sensitive" individuals in the number of responses consistent with

misinformation in the experimental group was statistically significant ($F(1, 123) = 5.766$; $p = 0.018$; $\eta^2 = 0.045$). Highly sensitive participants were significantly less frequently susceptible to the misinformation effect ($M = 1.12$; $SD = 1.11$) than those with medium/low sensitivity ($M = 1.74$; $SD = 1.20$). In the control group, the mean responses were the same ($p = 0.999$). Detailed results of ANOVA (main and simple effects) in terms of the number of responses consistent with misinformation are presented in Table 2.

Moreover, the additional analysis using regression analysis was performed, while sensory processing sensitivity was treated as an underlying continuous dimension, as suggested by some analysis (see Greven et al., 2019). The whole model was statistically significant ($R = 0.56$, $F(2, 124) = 27,89$, $p < 0,001$). The presence of misinformation was significant ($B = 1,24$, $p < 0,001$), but the continuous scores in the HSP Scale were no longer a significant predictor ($B = -0,001$, $p = 0,77$) of susceptibility to misinformation. The Table 3 covers more details results of regression analysis.

GENERAL DISCUSSION

Verification of hypotheses and interpretation suggestions

The obtained results indicate a strong occurrence of the misinformation effect, well replicable in past research (e.g. Blank, Launay, 2014). Regardless of the degree of sensitivity, the participants of the study showed submission to misinformation. Therefore, hypothesis 1 has been confirmed.

When it comes to hypothesis 2, a statistically significant difference was demonstrated in susceptibility to misinformation between high and medium/low sensitive subjects. Highly sensitive individuals were statistically significantly less likely to respond in line with misinformation included in the following material, and thus proved to be more resistant to misinformation. However, the interaction was not observed when sensory processing was measured as a linear variable using regression analysis. The interactive effect was only found when the most highly sensitive individual were set apart from the rest of the group. This result can support the thesis of dichotomous pattern of high sensitivity and the assumption that highly sensitive people form a qualitatively separate group.

The sensitivity of sensory processing is such a complex theoretical construct that it is not easy to discern why these results were obtained. It seems most likely that the highly sensitive subjects viewed and processed the original material more carefully than those with a medium/low level of sensitivity. This depth of processing the incoming information, corresponding to the first letter of the DOES acronym, is the most elementary component of sensitivity (Aron, 2017). It found its reflection even in the scientific name of high sensitivity - sensory processing sensitivity (Aron, Aron, 1997). Additionally, there are indicators that an overall cognitive functioning is better among vulnerable people (Aron, 2018). It is known and well-examined that

general intelligence (Gudjonsson, 1993; Harris, Goodman, Augusti, Chae, & Alley, 2009) and memory (e.g. Brydges, Gignac, & Ecker, 2018) have a key positive impact on the quality of testimony. Moreover, another explanation could be related to sensing the subtleties and noticing details that medium/low sensitive people ignore or do not see. This thesis has the confirmation in the study in which highly sensitive participants achieved higher scores in the visual processing task (Gerstenberg, 2012). The other possibility is that highly sensitive respondents experienced a higher level of stress when being placed in the experimental situation, which in turn contributed to greater resistance to misinformation (see Hoscheidt, LaBar, Ryan, Jacobs, Nadel, 2014; Nitschke, Chu, Pruessner, Bartz, Sheldon, 2019; Vogel, Schwabe, 2016). Research results (e.g. Way, Taylor, 2010) indicate an increased level of cortisol in the blood of sensitive people, especially in a challenging and social situation, and for this an experimental situation can be considered. Empathy – another component of sensitivity – could also influence the results of the study. It is especially developed in highly sensitive individuals (Aron et al, 2010) and may have resulted in greater motivation to engage in the study procedure. The highly sensitive people, as more fond of art and sensitive to the aesthetic aspects (Aron, 2017), probably watched a fragment of the Television Theatre more carefully. The final scene of the play *Three Sisters* is emotional, and also the highly sensitive react more strongly to the emotional facet of the situation (Lovecky, 1986).

Limitations of the study

One of the weaknesses of the hereby study was the disparity in the number of respondents in study groups. Due to the lack of an exact cut-off point in the HSP Scale scores required to consider a person as highly sensitive, while selecting a group of highly sensitive people some of them may have been excluded or contrarily too many of them could have been included.

Future research directions

The task for the future is the adaptation of the Highly Sensitive Person Scale. It is also recommended to perform further research on other types of original material. Another suggestion is to control the level of perceived stress and to extend the research on other age groups and with different educational levels; and for younger respondents, use the version of the scale for children – the Highly Sensitive Child Scale (Pluess et al., 2018).

A manipulation of the self-esteem of highly sensitive subjects could be introduced as a moderating variable. The situational raising (the effect of reinforced self-affirmation, see Szpitalak et al., 2013) or lowering (the effect of reinforced failure, *ibidem*) of self-esteem could influence the effect of misinformation, especially considering the fact that highly sensitive people are more sensitive to feedback and tend to have a low self-esteem (Aron, 2020).

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APPENDIX 1. CRITICAL QUESTIONS FROM THE FINAL MEMORY TEST OF THE ORIGINAL EVENT, ALONG WITH THE ANSWERS WITHIN WHICH THE MANIPULATION WAS MADE

OM – INFORMATION CONSISTENT WITH THE ORIGINAL MATERIAL; M - MISINFORMATION

1) What was the colour of Irina's belt? (OM – *brown*, M – *black*)
2) What does Vershinin combine the assiduity with? (OM – *with education*, M – *with intelligence*)
3) Whose hand does Vershinin kiss for goodbye? (OM – *Olga*; M – *Olga and Masha*)
4) Kuligin with a beard looks like a teacher of what subject? (OM – *German*; M – *Math*)
5) What does Natasha want to do at first when she is home alone? (OM – *cut down old trees*; M –*plant flowers*)
6) How long would Natasha want Irina to stay? (OM – *another week*; M – *one more moment*)
7) With what adjective does Anfisa (old nanny) describe herself? (OM – *sinful*; M – *miserable*)

Table 1. Number of responses consistent with misinformation in the critical questions (the range of possible values 0-7).

Misinformation	Sensory processing sensitivity	Number of answers consistent with misinformation in the memory test		95% confidence interval for the mean	
		Mean	Standard deviation	Lower limit	Upper limit
None (control condition)	Low/medium sensitivity	0,33	0,56	0,06	0,61
	High sensitivity	0,33	0,49	0	0,76
	Overall	0,33	0,54	0,20	0,46
Present (experi-mental condition)	Low/medium sensitivity	1,74	1,20	1,48	2,01
	High sensitivity	1,12	1,11	0,68	1,56
	Overall	1,58	1,20	1,29	1,88
Overall	Low/medium sensitivity	1,05	1,18	0,85	1,23
	High sensitive	0,71	0,93	0,42	1,03
	Overall	0,96	1,12	0,77	1,15

Table 2. Two-way ANOVA results for the number of responses consistent with misinformation.

Measured effect		$F (1,123)$	p	η^2 partial
Misinformation		35,87 (hypothesis 1)	< 0,001	0,23
Level of sensitivity		2,92	0,09	0,023
Interactive effect		2,92	0,09	0,023
No misinformation vs. misinformation	Low/medium sensitivity	53,80	< 0,001	0,304
	High sensitivity	6,32	0,013	0,049
Low/medium sensitivity vs. high sensitivity	Control condition	< 0,001	0,999	< 0,001
	Experimental condition	5,77 (hypothesis 2)	0,018	0,045

Table 3. Regression analysis of continuous HSP scores on the number of responses consistent with misinformation.

Predictor	B	Beta	t-value	p
Misinformation	1,24	0,56	7,45	< 0,001
SPS scores	-0,001	-0,02	-0,30	0,77