



Personality characteristics associated with susceptibility to false memories

Andri Hrafn Sigurðsson

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Author: Andri Hrafn Sigurðsson

Department of Psychology
School of Business

Abstract

Previous studies on memory have shown that individual personality characteristics are associated with false memories. The main aim of this research was to explore whether certain personality characteristics as measured with NEO-FFI five factor personality dimensions are associated with susceptibility to false memories. Participants (N=40) watched an emotional video clip and answered eight correct questions (events took place in the clip) and four false questions (events did not take place in the clip). Participants were encouraged to guess (confabulate) answers to the false questions and were then tested again a week later to see if they had created false memory for the confabulated answers. It was hypothesized that susceptibility to false memories would vary depending on whether individuals scored high or low on a certain personality dimension. The results showed that two personality dimensions, conscientiousness and openness to experience were significantly associated with susceptibility to confabulate and later form false memories.

Abstract – Íslenska

Fyrri rannsóknir á minni hafa sýnt að einstaklingar með ákveðin persónuleikaeinkenni eru næmari fyrir myndun falskra minninga heldur en aðrir. Markmið rannsóknarinnar var að kanna hvort að ákveðin persónuleikaeinkenni, mæld með NEO-FFI persónuleikaprófi, spái fyrir um myndun falskra minninga. Þátttakendur, 40 talsins, horfðu á tilfinningaþrungið myndbandsbrot og svöruðu átta réttum (atburðir sem áttu sér stað) og fjórum fölskum (atburðir sem áttu sér ekki stað í myndbrotinu) spurningum. Í þessari rannsókn voru þátttakendur beðnir um að giska ef þeir vissu ekki svarið við fölsku spurningunni og voru síðan prófaðir aftur viku síðar til að sjá hvort þátttakendur höfðu myndað falska minningu. Skoðað var hvort það væri munur á myndun falskra minninga eftir því hvort þátttakendur skoruðu hátt eða lágt á tiltekinni persónuleikavídd. Niðurstöður sýndu að tvær persónuleikavíddir, samviskusemi (e.conscientiousness) og hversu opinn gagnvart nýjungum einstaklingurinn er (e.openness to experience) tengdust marktækt þeirri tilhneygingu að búa til svar (giska) og síðar mynda minningu varðandi svarið.

The term “false memories” refers to when one remembers items or events that did not occur or remember an event that is quite different from the way it actually happened (Brainerd & Reyna, 2005). False memories therefore are incorrect beliefs about facts and past events that a person has incorporated and experienced as genuine memories (Kapardis, 2009). Memory distortion like false memories has received considerable attention by researchers in recent years with studies showing that individuals do create false memories under various circumstances (e.g., Howe, Gagnon, & Thouas, 2008; Ira E. Hyman, Husband, & Billings, 1995; Mazzoni & Memon, 2003; Moray, 1959; Stadler, Roediger, & McDermott, 1999).

Recent studies have demonstrated that some participants are still convinced that their false memory was real even after time has passed since the false memory was implanted (Bernstein et al., 2005; Laney et al., 2008; McDermott, 1996). Study by Laney, Fowler, Nelson, Bernstein, and Loftus, (2008) found strong evidence that participants form false memories about specific events in their childhood and are later still convinced that their false memories are true. In this study, participants were given false memories for either liking or disliking a specific kind of vegetable first time they tried it as a child. Subsequently those participants who created false memories of liking or disliking the vegetable started to believe it and their confidence grew stronger. Those who believed liking it were associated with greater liking for this vegetable and were more likely to order it in a restaurant and also showing more positive feelings towards it. Similarly, those who were told they disliked the vegetable were less likely to order it in a restaurant and showed negative feelings towards the vegetable. The study therefore indicates that false memories are formed and exist even weeks after they are formed.

There has been relatively little research concerning individual personality difference and false memories. Few studies however, have shown that individuals with certain personality characteristic show greater propensity to create false memories (Frost, Sparrow, & Jennifer,

2006; Paddock, Terranova, Kwok, & Halpern, 2000; S Porter, 2000).

For example, Frost, Sparrow and Jennifer (2006) examined personality characteristics and false memories using the Myers-Briggs Type Indicator (MBTI) to measure personality. The MBTI measures four personality dimensions consisting of opposite pairs: introversion-extraversion, sensation-intuition, thinking-feeling and judging-perceiving. According to the MBTI, the higher the score for introversion-extraversion, the stronger the tendency towards introversion (direct their attention toward one's own thinking and ideas). The lower the score on this dimension, the higher the tendency toward extraversion (to direct their attention toward others). In their study participants were interviewed after watching a movie clip. The interviewer would encourage them make up an answer (confabulate) to questions concerning the movie clip and if participants resisted answering a question they were told to guess. Confabulation is when the interviewer encourages the participants to make up an answer without necessarily believing it (Barba, 2002). Studies on memory have shown that asking people to confabulate informations can later lead to false memories (e.g., Ackil & Zaragoza, 1998; Zaragoza, Payment, Ackil, Drivdahl, & Beck, 2001).

According to the study by Frost et al. (2006) recognition of false events was assessed with twenty yes-no questions in following form: "when you watched the video, did you see____?" Yes or no. Eight of the questions were true and the four remaining were false event questions requiring participants to confabulate an answer about events that never occurred. During the first interview, participant's received feedback for their responses (confirmatory vs. neutral feedback). Each participants received confirmatory feedback (e.g., "That's right, (four) is the correct answer") after confabulating on two of the false event questions. The remaining responses were followed by neutral feedback (e.g., "(Four), OK").

A week later, participants answered yes-no recognition test that included questions about

details they had confabulated about during the first interview. Results from this study indicated that personality dimensions appeared to be linked to false memories induced by confabulation. Their findings indicated that individuals who scored low on the extroversion/introversion dimension or more extraverted individuals were more likely to create false memories when encouraged by confirmatory feedback. Thinking-feeling dimension was also associated with susceptibility to false memories. Feeling participants had a strong tendency to accept and remember false events associated with confirmatory feedback and neutral feedback by the interviewer (Frost et al., 2006).

Although the Myers-Briggs Type Indicator (MBTI) has been widely used, it has received some criticism. Bayne (1997) argues that the measure and the results it provides can be quite unclear and confusing. The reliability and validity has also been questioned (Bayne, 1997). For example, it has been argued that people who complete the MBTI twice often get different results, indicating its low reliability (Pittenger, 1993). Therefore another possibility to assess personality characteristics would be the NEO Five-Factor Inventory (NEO-FFI) which has shown strong cross-cultural consistency, validity and reliability (Bayne, 1997; McCrae & Costa Jr., 2004; Rosellini & Brown, 2011).

Porter, Birt, Yuille and Lehman (2000) used NEO-FFI personality questionnaire to gather information concerning personality. They were also the first to examine the association between personality and memory distortion using the NEO Five-Factor Inventory (NEO-FFI). The NEO-FFI is a 60-item choice questionnaire used to assess personality type based on the big five approach to personality (Costa & McCrae, 1992; 2004).

The NEO-FFI personality test was developed to operationalize the Five-Factor Model (big five), which reveals five major and basic dimensions of personality: Neuroticism which refers to individuals who exhibit depression, anxiety, hostility, feel self-conscious, experience

vulnerability and act impulsively. Studies have shown that individuals who score high on neuroticism are more likely to be affected by negative life events, to be more reactive to stressors and to have bad moods (Suls, Green, & Hillis, 1998). There is also evidence that the dimension may impair academic performance such as overall final exams marks (Chamorro-Premuzic & Furnham, 2003). Extraversion is thought to consist of sociability and refers to individuals who are positive and have positive attitude on life, to be warm, assertive, seek excitement and are active. Extraversion is associated with the intensity of relationships such as high energy level, sociability and seeking excitement (DeNeve & Cooper, 1998). Individuals high on extraversion tend to be more likely to step forward as leaders (Judge, Higgins, Thoresen, & Barrick, 1999). Agreeableness refers to the propensity to trust in other individuals, be straightforward and honest in communication and get along well with others and is associated with modesty, humility and altruism. An individual high on agreeableness focuses on the quality of relationships with others. They are also flexible when dealing with other people and tend to be forgiving and courteous (DeNeve & Cooper, 1998; Judge et al., 1999). Openness to experience refers to the extent to be open to feelings of others, ideas and values, has broad interest and willing to take risks. Those who score high on this dimension are more likely to be more intelligent, imaginative and curious than others whereas those who score low are more closed-off and resistant to change (Barrick & Mount, 1991). Openness to experience is associated with creative thinking and these individuals are open for trying new things (Costa & McCrae, 1992). Finally Conscientiousness refers to individuals who are reliable, responsible, competent, motivated to achieve goals and persevering. They also show a certain degree of persistence and hard work (Costa & McCrae, 1992). Conscientiousness has been shown to lead to higher academic performance in school (Chamorro-Premuzic & Furnham, 2003). There is also a strong link between individuals high on conscientiousness and attendance at work (Judge, Martocchio, & Thoresen, 1997).

In the study by Porter et al. (2000) the interviewer attempted, in three interviews over 2 weeks, to elicit false memory in each participant using guided imagery and by encouraging repeated attempts to recover the memory. First they were questioned about both correct and false emotional events, each introduced as true, which were supposed to have happened between the ages of 4 and 10. Then participants were tested again about the false events. If the participants reported remembering the suggested event, it was classified as false memory. According to the results, participants who scored low on extraversion dimension were more susceptible to produce false memories from childhood.

Very few studies have examined personality and false memories, different tools used for measuring and different ways to produce false memories. The main goal of this study is to examine whether certain personality characteristics are associated with susceptibility to false memories using the NEO-FFI questionnaire. False memories in this study were examined by using the confabulation paradigm of Frost et al. (2006). Participants watched an emotional video clip and were then interviewed and asked to answer questions concerning events that did or did not take place in the video clip. Participants were encouraged to guess answers to the false questions and were then tested again a week later to see if they had created a false memory for the confabulated answers. It is expected that susceptibility to false memories is dependent on how individuals scored on a certain personality dimensions. In particular it was expected that those high on openness to experience (imaginative) and low on conscientiousness (unreliable) would be more likely than others to confabulate and to remember the events as real a week later.

Method

Participants

The participants were 40 undergraduate students from Reykjavík University and University of Iceland, 19 males and 21 females. Participants age ranged between 19-45 years ($M = 23, 32$ years) and all participants volunteered to take part in the study.

Stimuli and materials

The video clip. One video clip from the television show *Sons of Anarchy* was used in the experiment. The emotional video clip was from the first season, episode 12 and was 11 minute long. The beginning of the clip starts at 31:01 and it ends at 42:02. The video clip showed a dramatic scene where an innocent woman is accidentally killed by a man that was supposed to murder her husband.

NEO-FFI personality questionnaire. The NEO-FFI (Costa & McCrae, 1992) is a 60-item version of the NEO personality Inventory-Revised, with five 12-item scales which measure the five personality domains. This personality questionnaire is self-administered where participants answer each item on five point scale. The NEO-FFI includes five scales of neuroticism, extraversion, openness to experience, agreeableness and conscientiousness. The five point scale recorded responses on each item ranging from one (strongly disagree) to five (strongly agree). Examples of two questions are, “I really enjoy talking to others”, or “I am always excited and nervous”.

The questionnaire. Two questionnaires were used to assess participant’s memory for the emotional video clip. The first questionnaire was administered immediately after participants watched the clip and included eight correct questions, about events that took place in the clip, and four false questions, about events that did not take place in the clip. Example of false question are; “what did the police give the old motorcycle man in front of the house?” Examples

of correct questions are; “the intruder was supposed to kill the man but accidentally shoot the women, why was that”? The participants were asked to guess the answers to those questions they might not know or could not remember.

For the follow-up interview a week later a true or false questions were used. Participant’s false answers from the week before were incorporated into depending on what he answered. This was done to see if the participants would answer the questions as true – to see if they had formed a false memory. For example, if a participant would give the answer „Keys“ to the question „What did the police give the old motorcycle man in front of the house?“ during the first interview, then the question he or she would receive a week later would be „The police gave the motorcycle man keys in front of the house – true or false“. For those who did not confabulate to certain questions during the first interview, a standard question was used at the second interview. For example, the intruder was supposed to kill the man but accidentally shoot the woman – true or false”

Equipment. The participants watched the video clip on a 19 inch Hewlett-Packard (HP) computer screen and their answers were recorded on a 15.6 inch HP laptop.

Design and Procedure

Data was analyzed in a 2 time of interview (first vs. second) x 2 types of questions (false vs. correct) x 2 personality dimension (high vs. low) mixed ANOVA for each personality dimension.

Prior to the study, participants were assigned to come to an interview room which in this case was traditional high school classroom. Participants received instructions concerning the experiment when they arrived to the classroom located at Reykjavik University. It was highly important that participants could not be aware that the study concerned susceptibility to create false memories. Therefore participants were not informed about the true nature of the study but

told what was involved in participating in the study. Each participant was tested individually for approximately 20-30 minutes in the interview room. Only the experimenters (two males) were presented during both the first interview and the second (follow-up). An approval from the BSc Psychology course committee at Reykjavik University was given before the experiment was conducted. The study was also reported to the Data Protection Authority in Iceland.

Participants began with reading and signing an informed consent form. Participants then watched the video clip on a computer screen inside the interview room. After watching the video clip the interviewer gave instructions to the participant that he would have to answer a set of questions regarding the video clip. All participants were initially asked to respond to the question “Have you ever seen the video clip before?” Those who claimed to have seen the clip were not used in the experiment. The participants were encouraged to answer all of the questions and if they did not remember an answer to a question, they were told to guess the answer to it instead of not answering at all. This was done in order to elicit confabulated answer from the participants to the false questions. However, the participants were not forced to answer the false questions. Questions were read in the same order for every participant.

A week after the first interview session, participants were contacted again for the second interview (follow up), either through telephone call or directly at Reykjavik University. During the follow up, participants were asked to answer another set of questions similar to the questions from the week before. The questionnaires used at the second interview were true or false questions. By asking these questions the experimenter was trying to see if the participants’ answers from the week before had led them to create a false memory.

Data scoring

Participants in the study were encouraged to guess or confabulate an answer to questions they did not know the answers to or could not answer. Those participants who confabulated an

answer during the first interview were given a score of 1 and 0 if they did not answer the false questions. Similarly concerning correct questions, if the participants answered the correct event questions correctly they were given a score of 1 but otherwise 0 for that question. For the follow up interview, if the participants answered the true or false questions by saying true, they received 1 otherwise 0. The scores were then converted into percentages. For the personality dimensions, responses on each item ranged from one (strongly disagree) to five (strongly agree). Using a median split, subjects were divided into two groups, those who scored high or low on a certain personality dimension.

Results

This research looked at the role of personality dimensions in forming false memories, as well as correctly recalling events. A 2 time of interview (first vs. second) x 2 types of questions (false vs. correct) x 2 personality dimensions (high vs. low) mixed ANOVA was used to analyze the data for each personality dimension separately. The alpha criterion for significance was set at .05. No participant had seen the video clip used in this study and therefore no participant was excluded.

Neuroticism

Table 2 summarizes the descriptive statistics for the neuroticism personality dimension (high vs. low). Neuroticism refers to individuals who exhibit anxiety, feel self-conscious and act impulsively (Caspi, Roberts, & Shiner, 2005; Costa & McCrae, 1992). For those who scored high on neuroticism, individuals who are more reactive and impulsive, their tendency to confabulate were higher (73%) than their tendency to recall the confabulation as a memory (56%). Participants who scored low on neuroticism, individuals who are less reactive, confabulated on 64% of the questions and similarly recalled 58% as an event that took place in

the second interview.

Table 1

Percentage of false and correct answers on week 1 and week 2

Neuroticism		Interview 1	Interview 2
False answers			
High	Mean	73	56
	Std. Deviation	28	32
Low	Mean	64	58
	Std. Deviation	25	28
Correct answers			
High	Mean	93	97
	Std. Deviation	08	05
Low	Mean	89	93
	Std. Deviation	10	09

The results from the ANOVA test revealed a non-significant main effect of time $F(1,38) = 1.83, p = .18$ and dimension $F(1,38) = 1.04, p = .31$ whereas the main effect of type of questions was significant $F(1,38) = 61.11, p = .00$ showing as would be expected that participants answered higher percentage of the correct questions compared to the false questions. The interaction between the variables time and dimension $F(1,38) = 1.06, p = .30$, type and dimension $F(1,38) = .00, p = .97$ and time, type and dimension $F(1,38) = .92, p = .32$ were all non-significant. The only significant interaction was between time and type $F(1,38) = 7.52, p = .00$. As figure 1 and 2 show, participants tended to confabulate answers to the false questions at a higher rate than what they recalled a week later. For the correct questions however, participants answered higher percentage of questions in the second compared to the first interview.

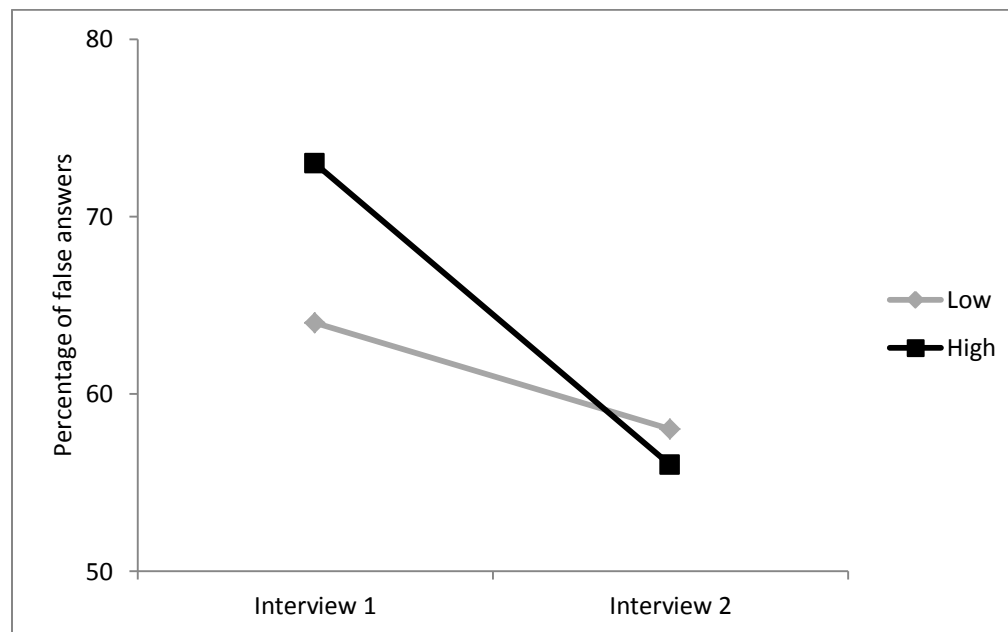


Figure 1. Percentage of false answers for high and low neuroticism for week 1 and week 2

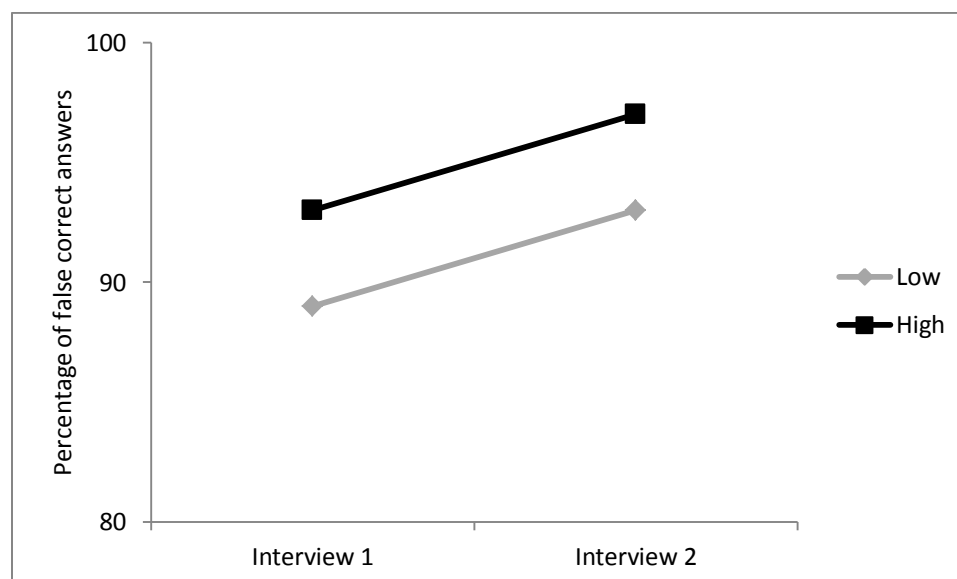


Figure 2. Percentage of correct answers for high and low neuroticism for week 1 and week 2

Agreeableness

Table 4 demonstrate the descriptive statistics for the agreeableness personality dimension. People high on agreeableness show trust in other people and tend to be honest and straightforward in communication while those who score low are unconcerned about others and

arrogant (Caspi et al., 2005; Costa & McCrae, 1992). Participants who scored high and low on the dimension recalled similar proportion of their confabulated answers in the second interview. This can be seen in table 4.

Table 2

Percentage of false and correct answers for week 1 and week 2

Agreeableness		Interview 1	Interview 2
False answers			
High	Mean	67	59
	Std. Deviation	26	32
Low	Mean	69	55
	Std. Deviation	28	28
Correct answers			
High	Mean	89	95
	Std. Deviation	10	08
Low	Mean	92	94
	Std. Deviation	09	07

The results from the ANOVA test revealed no significant main effect of time $F(1,38) = 1.80, p = .18$ and dimension $F(1,38) = .00, p = .97$. However there was significant main effect of type $F(1,38) = 61.42, p = .00$ showing that participants answered more of the correct questions. There was a significant interaction between time and type $F(1,38) = 7.14, p = .01$. Again, percentage of confabulation at time 1 was higher than recalled false memories at time 2. But for the correct questions, participants tended to answer slightly more questions at time 2 compared to time 1. According to the results, no other interactions were significant.

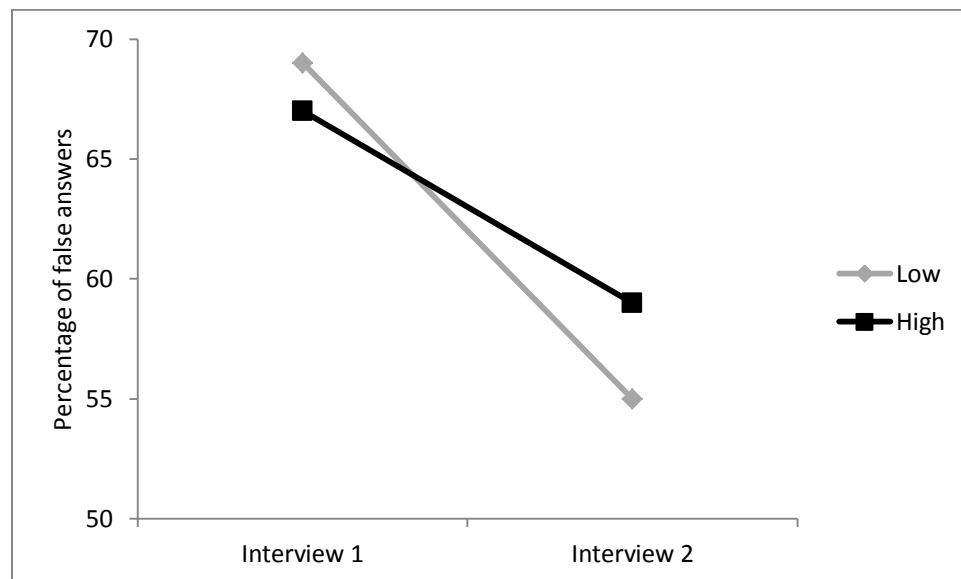


Figure 3. Percentage of false answers for high and low agreeableness for week 1 and week 2

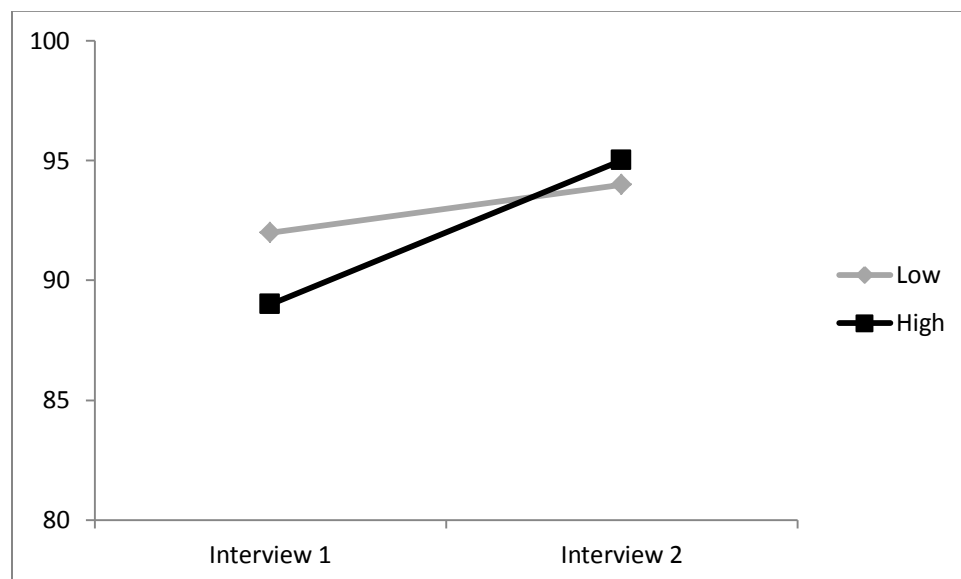


Figure 4. Percentage of correct answers for high and low agreeableness for week 1 and week 2

Extraversion

Table 5 summarizes descriptive statistics for both false answers and correct answers on week 1 and week 2 for extraversion personality dimension (high vs. low). Extraverted consist of sociability and refers to individuals who are warm, assertive and seek excitement and activities. People who score low on extraversion prefer to spend their time alone and are characterized as

quiet and independent (Caspi et al., 2005; Costa & McCrae, 1992) As table 5 indicates, there was small difference for participants scoring high and low and their tendency to falsely recall a memory about an event that never took place.

Table 3

Percentage of false and correct answers on week 1 and week 2.

Extraversion		Interview 1	Interview 2
False answers			
High	Mean	68	57
	Std. Deviation	28	26
Low	Mean	69	55
	Std. Deviation	27	34
Correct answers			
High	Mean	90	93
	Std. Deviation	11	09
Low	Mean	92	96
	Std. Deviation	08	05

The results from the ANOVA test revealed no significant main effect of time $F(1,36) = 2.18, p = .14$ and dimension $F(1,36) = .05, p = .81$. The main effect of type was significant $F(1,36) = 56.22, p = .00$ showing that participants answered more of the correct questions. The only significant interaction were between the variables time and type $F(1,36) = 7.67, p = .00$ indicating as for the other dimensions that participants tend to confabulate at a higher rate than what they recall as a false event a week later. For correct questions, participants answer more questions at a week later (Figure 5 and 6). Other interactions were all non-significant.

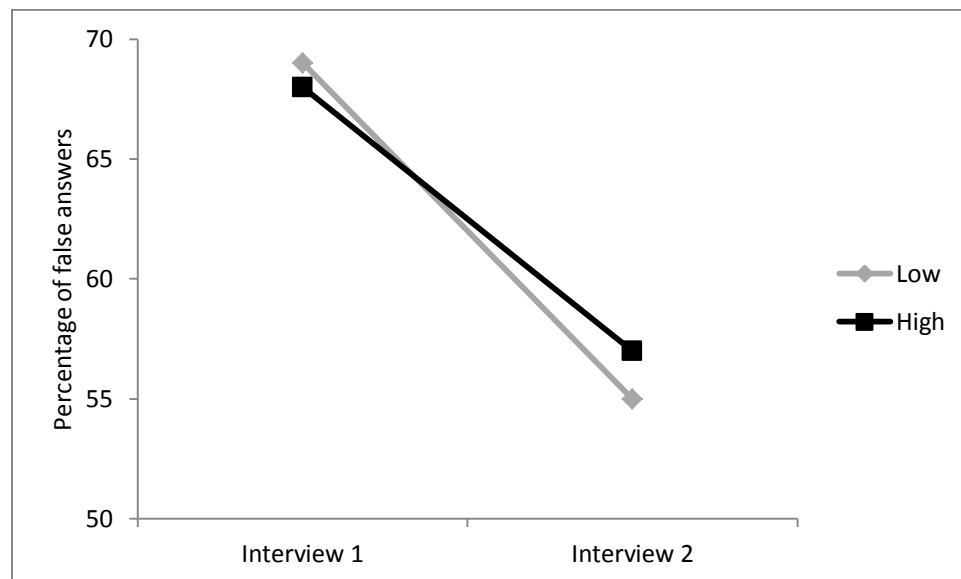


Figure 5. Percentage of false answers for high and low extraversion for week 1 and week 2

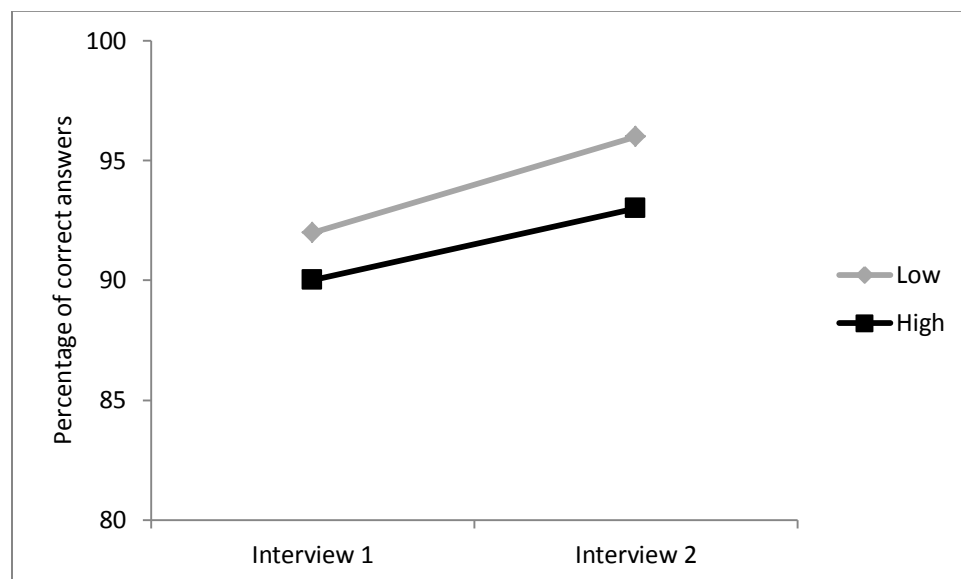


Figure 6. Percentage of correct answers for high and low extraversion for week 1 and week 2

Openness to Experience

Table 3 summarizes the descriptive statistics for openness to experience (high vs low) personality dimension. Openness to experience refers to individuals who are open to feelings of others, has broad interest and are willing to take risk and try new things (Caspi et al., 2005; Costa

& McCrae, 1992). As can be seen in table 3, the tendency to confabulate for participants who score low on the dimension were higher than their tendency to recall the confabulation as a memory but this was not the case for those participants who score high on the dimension.

Table 4

Percentage of false and correct answers on week 1 and week 2.

Openness to experience		Interview 1	Interview 2
False answers			
High	Mean	60	59
	Std. Deviation	29	26
Low	Mean	76	55
	Std. Deviation	23	33
Correct answers			
High	Mean	91	95
	Std. Deviation	09	07
Low	Mean	91	95
	Std. Deviation	10	08

The results from the ANOVA test revealed a non-significant main effect of time $F(1,38) = 1.55, p = .22$ and dimension $F(1,38) = .59, p = .44$. However the main effect of type was significant $F(1,38) = 62.91, p = .00$ showing that participants answered more of the correct questions. The interaction between the variables type and dimension $F(1,38) = .71, p = .40$ was not significant but the interaction between time and dimension $F(1,38) = 3.01, p = .09$, and time, type and dimension $F(1,38) = 2.98, p = .09$ approached significance. The interaction between time and type $F(1,38) = 7.17, p = .01$ was significant. As can be seen in Figure 7, participants tend to confabulate more at time 1 compared to recalling false events at time 2 but this was only true for those low on the dimension (individuals not open to the feelings of others or willing to take risks). For correct events questions, participants answered more correct questions at time 2

compared to time 1.

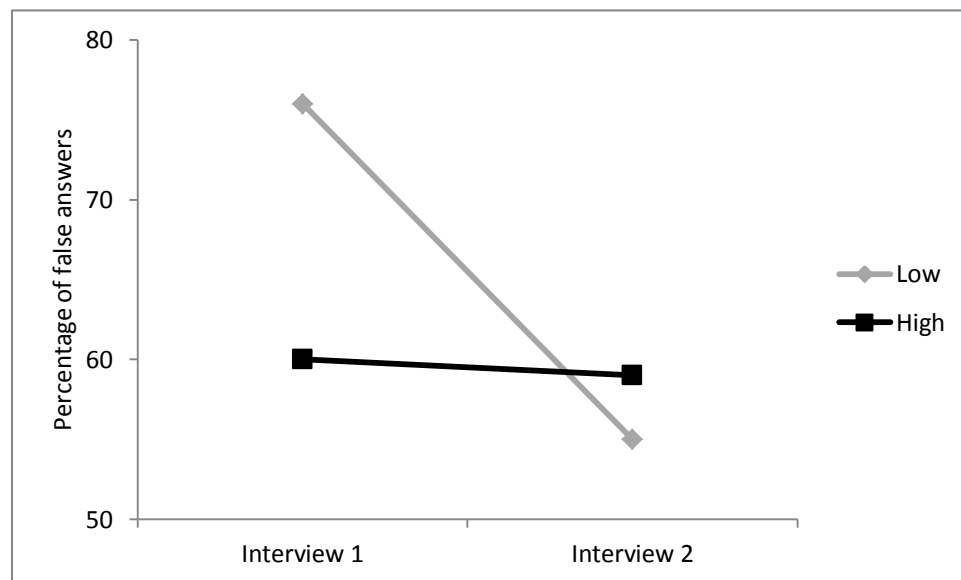


Figure 7. Percentage of false answers for high and low openness to experience for week 1 and 2

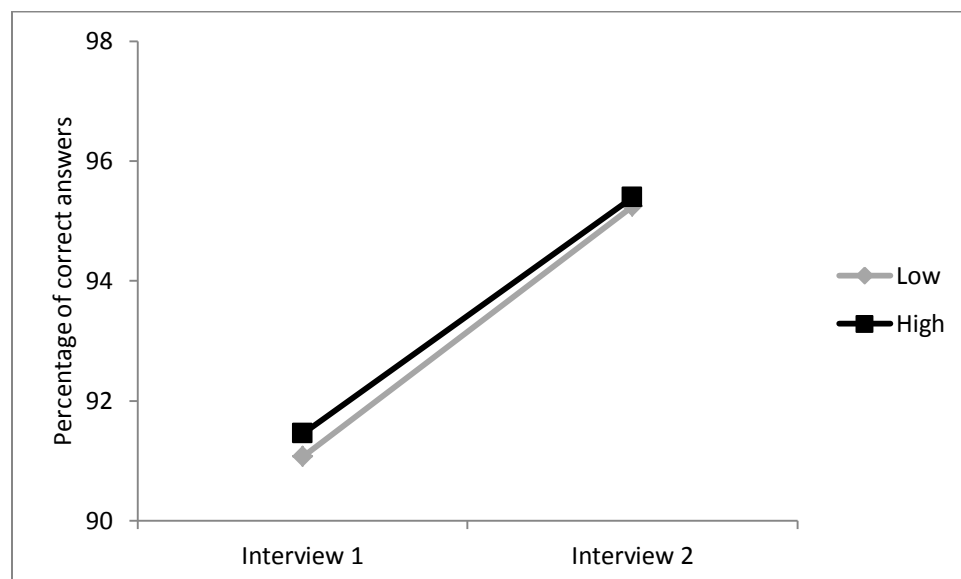


Figure 8. Percentage of false answers for high and low openness to experience for week 1 and 2

Conscientiousness

Table 1 summarizes the descriptive statistics for the conscientiousness (high vs. low) personality dimension. Conscientious individuals are reliable, responsible and motivated to

achieve goals; those low on this dimension are unreliable and irresponsible (Caspi et al., 2005; Costa & McCrae, 1992). Individuals who scored high on the dimension, who are more reliable, confabulated on 60% of the questions and similarly recalled 64% as an event that took place in the second interview. The tendency to confabulate for individuals who scored low on the dimension was higher than their tendency to recall the confabulation as a memory.

Table 5

Percentage of false and correct answers on time 1 and week 2.

Conscientiousness		Interview 1	Interview 2
False answers			
High	Mean	60	64
	Std. Deviation	27	22
Low	Mean	79	48
	Std. Deviation	23	35
Correct answers			
High	Mean	90	94
	Std. Deviation	10	08
Low	Mean	91	96
	Std. Deviation	09	07

The results from the ANOVA test showed a non-significant main effect of time, $F(1, 38) = 3.26, p = .07$ (although approaching significance) and for dimension $F(1, 38) = 0.13, p = .71$. The main effect of types of questions was significant $F(1, 38) = 60.6, p = .00$. There was a non-significant interactions between types and dimension $F(1, 38) = .00, p = .99$. The interaction between time and type $F(1, 38) = 11.97, p = .00$; time and dimension $F(1, 38) = 11.74, p = .00$ and time, type and dimension $F(1, 38) = 13.61, p = .00$ were all significant. As can be seen in figure 1 and 2, participants high and low on conscientiousness were remembering the correct questions at higher rate than the false questions. Participant's measured low on conscientiousness was

producing false memories at higher rate than individuals who scored high on the dimension in the first interview. In the second interview participants low on the dimension falsely recalled a memory about an event that never took place in 48% of cases compared to 64% for those who scored high on the dimension.

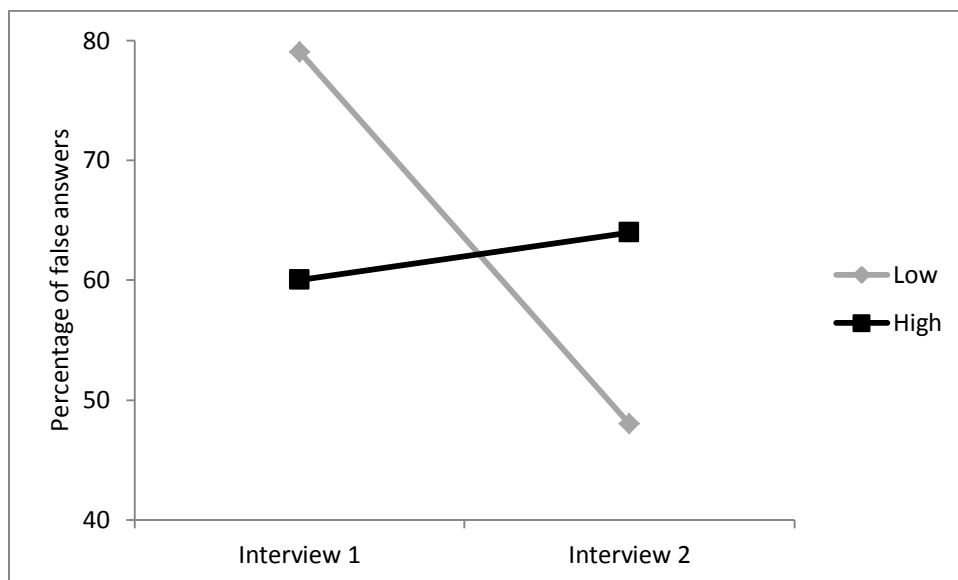


Figure9. Percentage of false answers for high and low conscientiousness for week 1 and week 2

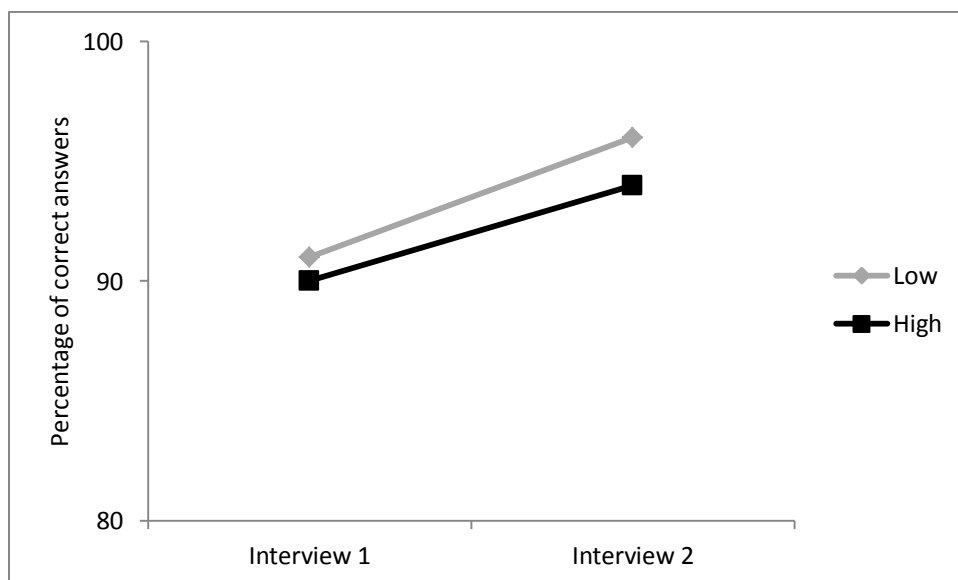


Figure 10. Percentage of correct answers for high and low conscientiousness for week 1 and 2

The results revealed that participants tended to answer higher percentages of correct questions compared to false questions. Furthermore, participants in general tended to confabulate at a higher rate at time 1 compared to recall of false events at time 2. However, the pattern was reverse for correct questions. Two of the five personality dimensions, conscientiousness and openness to experience seemed to affect the tendency to confabulate as well as false memory production.

Discussion

The current study offers insight into the relationship between personality characteristic and the formation of false memories. In this experiment it was hypothesized that susceptibility to false memories is dependent on whether individuals scored high or low on a certain personality dimension. The results from this study are consistent with the literature showing that personality characteristics are associated with the formation of false memories (Frost et al., 2006; Paddock, Terranova, Kwok, & Halpern, 2000; S Porter, 2000).

As outlined previously, confabulation always led to false memory recall but confabulation at time 1 was in all cases higher than recalled false events at time 2. However, the results were reverse for correct questions. Participants always answered more correct questions on time 2 compared to time 1 for all personality dimensions. This is consistent with a research by Frost et al. (2006) where participants answered correct-event questions in higher proportion compared to false event questions, according to the data from the recognition test from the second interview.

The results from the ANOVA test revealed that two personality dimensions of the NEO-FFI scales, conscientiousness and openness to experience, were the strongest predictors for the susceptibility to elicit false memories, particularly conscientiousness. Therefore these results suggest that the susceptibility to false memories vary depending on whether individuals score

high or low on a certain dimension. Those who scored low on both dimensions were confabulating at higher rate on time 1 compared to individuals low on extraversion, agreeableness and neuroticism as was expected. However it is important to notice that they were not more likely to recall their confabulation as a memory one week later. Interestingly the same pattern can be seen for individuals high on neuroticism dimension but according to the ANOVA test the results were not significant.

Participants who scored low on conscientiousness confabulated about false events in the first session in 79% of the cases compared to 60% for those who scored high on the dimension. In the second interview week later, participants low on conscientiousness falsely recalled a memory about an event that never took place in the video in 49% of cases compared to 64% for the more conscientious individuals. Thus, individuals low on the conscientiousness dimension, or less reliable, their tendency to confabulate an answer were much higher than their tendency to recall their confabulated answer as a memory. They confabulated on answers in interview 1 but they did not strongly hold on to their confabulated answers a week later. Possible explanation for this is that individuals who score low on conscientiousness are irresponsible, unreliable and careless (Costa & McCrae, 1992) and therefore they did not hold on to their confabulated answers.

Those who are high on conscientiousness, individuals who are reliable, responsible and motive to achieve goals confabulated and then recalled similarly as an event that took place in the second interview. They truly maintained their reliability and believed that their answers or confabulation were correct even after some time has passed from their confabulation. Therefore the results above supports the description of conscientiousness dimension (high vs. low) and also previous findings concerning the reliability of conscientiousness individual's which demonstrates that conscientious individuals show higher academic performance in school and

attendance at work, for example (Chamorro-Premuzic & Furnham, 2003; Judge et al., 1997).

The results for openness to experience showed similar pattern with the conscientiousness dimension. Those who scored low confabulated at higher rate compared to those who scored high on the dimension. The tendency to confabulate for participants who scored low on the dimension was higher than their tendency to recall the confabulation as a memory. Those who are open, scored high on the dimension confabulated on 60% of the questions and similarly recalled 59% in the second interview. The openness to experience dimension characterize individuals high on this dimension to show broad interest in what they are doing. This may be a result of open individuals showing more interest and therefore maintaining or simply paying more attention toward the study. Research by Barrick et al. (1991) showed that those who score high on this dimension are more intelligent, imaginative and curious than others whereas those who score low are more closed-off and resistant to change. Future studies should focus on why there is a strong tendency for those low on conscientiousness and openness to experience to elicit false memories.

The results from this experiment are consistent with the literature on false memories showing that by asking, or forcing participants to confabulate information or a story can lead to false memory (e.g., Ackil & Zaragoza, 1998; Zaragoza, Payment, Ackil, Drivdahl., & Beck, 2001). These results are also consistent with studies showing that false memories are consistent even after some time has passed since they confabulated (Bernstein et al., 2005; Laney et al., 2008; McDermott, 1996). Interestingly, the findings from this study differ from those given in Frost et al. (2006) and in Porter et al. (2000) in which extravert and thinking-feeling dimensions were the only dimensions found to affect the formation of false memories. Possible explanation for this is that both of these studies used a different approach to examine the relationship between personality and susceptibility to false memories. For example, Frost, Sparrow and

Jennifer (2006) employed Myers-Briggs Type Indicator (MBTI) to measure personality. It is noteworthy to mention that MBTI and NEO-FFI have different personality dimensions and dimensions are defined differently for the two questionnaires. According to MBTI, extraversion-introversion dimension are described as focused on people and the world outside them (extraversion) or their inner world (introversion). On the other hand, NEO- FFI describe extravert in a more elaborated way, like being warm, having positive attitude, have positive outlook on life and seeking activities and social interactions. Secondly, Frost et al. (2006) employed the use of confirmatory vs. neutral feedback technique following questions concerning the video clip. This could be interesting to continue researching with the use of NEO-FFI questionnaire to examine whether certain personality dimension are more likely to form false memory with the use of confirmatory or neutral feedback.

Study conducted by Porter, Birt, Yuille and Lehman (2000) is the only research to date, that we know of, which has examined the association between personality and false memory using NEO-FFI. Interestingly they found that individuals low on extraversion dimension were more susceptible to produce false memories. However, in their study the interviewer attempted to elicit false memories in participants from childhood.

Some limitations of the present study must be acknowledged. Lack of significant impact of personality characteristics on false memory might be due to relatively small sample. Due to this it is difficult to generalize the conclusion from this study. It is also the second time the association between personality characteristic and false memory are tested using the NEO-FFI personality inventory. Furthermore it will be important for future studies to use NEO-FFI to study the association between personality and false memories because of its strong reliability, validity and cross-cultural consistency. Additionally, we cannot rule out the possibility that participants may have gathered information concerning the video clip between the first interview

and the second week later which may have influenced the results.

In conclusion, as can be seen from previous text, personality characteristic and false memory is a complex topic and only by researching it further could we find what factors are important for the formation of false memory and also to see if there are other dimensions associated with false memory. As this study suggests, individuals high on conscientiousness and high on openness to experience are more likely than other personalities to believing some event or information that is not true.

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