



The Impact of Optimism and Pessimism on the Creation of False Memories: Gender Differences

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Abstract

Recent studies suggest that emotional events, mood and personality characteristics influence people's susceptibility to false memories. Additionally, many studies have demonstrated a gender differences in memory performance. This present study aims to examine if dispositional optimism or pessimism affect the creation of false memories and to determine if the effect is dependent on gender. Participants ($N = 40$) answered the Life orientation test-revised (LOT-R) which measures their dispositional optimism and pessimism. Then they watched an emotional video clip and answered a questionnaire about the video. The participants were encouraged to guess (confabulate) the answers to the questions if they did not remember the event. Participants were tested again a week later to examine if they had confused the confabulated answers for the experienced event, that is, created a false memory. The data for the optimism and pessimism dimensions were analyzed separately. The results demonstrated a non significant main effect of optimism/pessimism on the creation of false memories. Interaction between time of interview and gender on the false memory formation and correct recall for pessimist and optimist dimensions was either significant or approached significance. Interaction between time of interview, gender and level of optimism approached significance.

Keywords: false memories, personality trait, gender

Útdráttur

Fyrri rannsóknir hafa sýnt að tilfinningalegir atburðir, lunderni og persónuleikaeinkenni hefur áhrif á myndun falskra minninga. Þá hafa margar rannsóknir sýnt fram á kynjamun varðandi frammistöðu á hinum ýmsu minnisprófum. Markmið þessarar rannsóknar er að athuga hvort að bjartsýni eða svartsýni hafi áhrif á myndun falskra minninga og athuga einnig hvort myndun falskra minninga sé mismunandi eftir kyni. Þátttakendur ($N = 40$) byrjuðu á því að svara lífsafstöðu prófinu (LOT-R) en það próf mælir bjartsýni og svartsýni. Síðan horfðu þau á tilfinningahlaðið myndbrot og svöruðu spurningum um myndbrotið. Þátttakendur voru beðnir um að búa til svör við spurningum ef þau mundu ekki eftir atburðinum í myndbrotinu. Viku seinna var athugað hvort að svör þátttakanda hefði leitt til myndun falskra minninga. Gögn fyrir bjartsýnis og svartsýnis víddina voru rannsökuð í sitthvori lagi. Ekki var marktæk meginhrif bjartsýni eða svartsýni á myndun falskra minninga. Samvirknihrif tíma (viðtal 1 og 2) og kyns á myndun falskra minninga og fjölda rétta svara fyrir bjartsýnis- og svartsýnis víddina var marktæk eða nálgadist tölfræðilega marktækni. Þá nálgadist samvirknihrif tíma, kyns og bjartsýni einnig tölfræðilega marktækni.

Lykilhugtök: falskar minningar, persónuleikaeinkenni, kyn

False memories refer to memories of events that never occurred or memory distortion, that is, remembering the events differently from the way they happened (Roediger & McDermott, 1995). The false memory phenomenon has been demonstrated in many studies (Loftus & Pickrell, 1995; Ackil & Zaragoza, 1998) which have, among other things, shown that confabulation, emotional events, mood, and personality trait increase susceptibility to false memories (Ackil & Zaragoza, 1998; Forgas, Laham, & Vargas, 2005; Frost, Sparrow & Barry, 2006; Porter, Spencer, & Birt, 2003).

Asking people to confabulate, or make up answers even though they do not remember the information can influence the creation of false memories (Ackil & Zaragoza, 1998; Zaragoza, Payment, Ackil, Drivdahl, & Beck, 2001). In the study of Ackil and Zaragoza, 270 participants viewed a video clip and were asked true-event questions about the video clip but some of the questions involved false-event information, more specifically, they asked about events that never took place in the video. In consideration of answering the false-event questions the participants were required to answer all the questions. If they did not know the answers or did not want to answer them, they were encouraged to confabulate answers or make something up. One week later the participants were tested again to assess whether they had formed a false memory for the made-up events in the false questions. The result demonstrated that confabulation can increase susceptibility to false memories as many participants had created a false memory for events that they had been required to confabulate on or make up.

Another factor that seems to have impact on false memory formation is emotions. Recent studies suggest that emotional events increase the susceptibility to false memories compared to neutral events (Gallo, Foster, & Johnson, 2009; Otgaar, Candel, & Merckelbach, 2008). Furthermore, it has been demonstrated that different type of emotion, with positive or negative value, have a different effect on memory retrieval (Porter, Bellhouse, McDougall,

ten Brinke, & Wilson, 2010) with negative emotional events being associated with a greater susceptibility to false memory than positive and neutral events (Porter et al., 2003).

Research has also indicated that mood can influence people's susceptibility to misleading information (Hess, Popham, Emery, & Elliott, 2012; Storbeck & Clore, 2005). Results from many studies have demonstrated among other things that negative mood is associated with increased accuracy in memory retrieval whereas positive mood is associated with less accurate memory retrieval (Forgas et al., 2005; Hess et al., 2012; Storbeck & Clore, 2005).

Study by Forgas et al. (2005) examined if mood influenced people's susceptibility to misleading information when remembering scenes that they had witnessed. Participants (N = 96) viewed either positive (wedding celebration) or negative (car crash) photographs. Subsequently, they received mood induction where they had to re-experience and write about either positive, negative or neutral events from their lives. Then the experimenter asked the participants to complete a questionnaire about the scenes where some of the questions involved false-event information about these events. Later on, the experimenter measured their memory accuracy and asked the participants to answer true or false questions about the scene where some of them related to the misleading information from the previous questioning. The results indicated that participants who received the misleading information, created more false memories than those who did not receive the information. Furthermore, positive mood increased while negative mood decreased the susceptibility to remembering misleading details.

A study by Frost et al. (2006) examined whether personality traits were related to the false memory phenomenon. The participants (N= 40) viewed a video clip after answering questions from the Myers-Briggs Type Indicator which measures personality characteristics. After watching the video clip the participants were asked true-event questions about the video clip but some of the questions asked about events that never took place in the video. The

participants were encouraged to confabulate answers if they did not remember the event. A week later, the experimenter measured their memory accuracy and asked the participants to answer true or false questions about the scene where some of the questions related to the false events from the previous questioning. These questions were asked to examine if the confabulated answers from the week before had created a false memory. Similar to other studies where participants are required to confabulate the results indicated that confabulating about an event can later on lead to creation of false memories. Furthermore, certain personality dimensions are more susceptible to create false memories than others. Specifically, the introversion-extraversion and thinking-feeling dimensions had the strongest association with false memory formation where extroversion and feeling dimension was linked with higher rates of false recollections compared to introversion and thinking dimension.

Many studies have demonstrated a significant relationship between gender and memory performance (Herlitz, Nilsson, & Bäckman, 1997; Herlitz & Rehnman, 2008; Lowe, Mayfield, & Reynolds, 2003) .

Herlitz et al., (1997) examined gender differences in primary and secondary memory; episodic memory, semantic memory and priming. Subjects (N = 1000) participated in several memory tasks which assessed their memory performance. The results demonstrated that women performed better than men on the episodic memory tasks but there were no gender differences on the tasks assessing semantic memory, priming or primary memory. The episodic memory tasks included various assignments such as word recall, recall of newly acquired facts, free recall and cued recall.

Following these findings Bauste and Ferraro (2004) wanted to examine gender differences in false memory production for episodic memories. Participants (N =141) were presented with male and female word lists, using the Deese/Roedgier McDermott (DRM) paradigm. It was hypothesized that males would create more false memories for the male

word list while females would create more false memories for the female word list. Contrary to Bauste and Ferraro expectations and prediction, the results showed no gender differences for false memory production. No significant main effect of gender on the false memory production or interaction involving gender was found. One of the studies' shortcomings is that it uses word lists to assess episodic memory. Episodic memory is a memory system that enables individuals to remember unique, personal experiences from the past (Tulving, 2002), and therefore other stimuli, as watching a video clip and answering questions about it later on, would be considered more suitable when assessing episodic memory because it includes particular scenario unlike a word list.

In view of the literature demonstrating that false memories are affected by mood and personality trait (e.g. Forgas et al. 2005; Frost et al., 2006) and that there is a gender difference in memory performance for episodic memories (Herlitz et al., 1997), the aim of the present study is to examine the impact of pessimistic and optimistic trait on false memory production and whether the impact varies with gender. The optimism and pessimism trait have not been examined in connection with false memories before, however previous studies have shown that mood can increase or decrease the false memory production. The present study will examine false memories using the confabulation paradigm of Ackil and Zaragoza (1998) and Frost et al. (2006) where participants will be encouraged to guess (confabulate) answers to false questions about an event (negative emotional video clip) and their memories of the event as well as the false answers tested a week later. It is hypothesized that participants false memory production will vary with trait, with more pessimistic participants creating less false memories compared to more optimistic people. It is also hypothesized that false memory will vary with gender, with male participants creating more false memories than female participants. The study will also examine a potential interaction between gender and trait. In accordance with the research by Herlitz et al. (1997) it is also expected that women will have a higher correct recall compared to men.

Method

Participants

The participants were 40 students from Reykjavik University, 19 males (47,5%) and 21 females (52,5%). Their age ranged from 19-44 years ($M = 23,32$). All the participants volunteered to participate in this study.

Stimuli and materials

Life Orientation Test-Revised. Dispositional optimism and pessimism was measured with the Life Orientation Test-Revised (LOT-R) (Scheier, Carver, & Bridges, 1994) (See in Appendix 1). The test consists of six statements, three statements assess disposition of optimism (e.g. *"I am always optimistic about my future"*) and the other three assess disposition of pessimism (e.g. *"If something can go wrong for me, it will"*). Participants were asked to indicate if they agree or disagree to the statements on a five multi-point scale (ranging from 0 = *strongly disagree* to 4 = *strongly agree*).

Studies differ in how they conceptualize or operationalize the optimism/pessimism dimension. Several studies consider optimism/pessimism as one-dimensional. According to this view the LOT-R scores range from 0 to 24 where high scores indicate dispositional optimism and low scores indicate low optimism or pessimism. If the optimism/pessimism scale is defined one-dimensional the negative statements are reversed prior to scoring (Brissette, Scheier, & Carver, 2002; Dunn, Occhipinti, Campbell, Ferguson, & Chambers, 2011; Scheier et al., 1994). Other studies have recently challenged the one dimensional view and demonstrated that LOT-R items load on two factors (optimism and pessimism) and should be treated as two separate dimensions (Chang, D'Zurilla, & Maydeu-Olivares, 1994; Herzberg, Glaesmer, & Hoyer, 2006; Robinson-Whelen, Kim, MacCallum, & Kiecolt-Glaser, 1997). The present study considers optimism/pessimism as two dimensions.

Experienced emotion scale. The psychological measures consist of five words which describe people's emotions at any given moment (See in Appendix 2). Participants are asked

to indicate if they agree or disagree to the statements on a five multi-point scale (ranging from 1 = *strongly disagree* to 5 = *strongly agree*). These scales included the following emotions; calmness, anxiety, insecurity, happiness and being worried.

Video clip. Participants viewed a video clip from the television show *Sons of Anarchy* – episode twelve from season one. The video clip, which runs from minute 31:01 to 42:02, showed a negative emotional scene where a man murders an innocent woman instead of her husband by mistake. The participants watched the video clip on a 19 inch computer screen in Reykjavík University.

Questionnaires. Two interview sessions were carried out and the participant had to answer one questionnaire in each session (See in Appendix 3). The first questionnaire was asked instantly after the participants had watched the video clip. It included twelve questions about the video clip, eight questions were true and four questions were false. The true questions were about events that actually happened in the video clip while the false questions asked about events that did not take place in the video clip and were used to elicit false memories. Before answering the questionnaire, the experimenter encouraged the participants to guess if they did not know or remembered the answers. The encouragement was intended to make the participants confabulate answers to the false event questions. The following is an example of a false question: “What object did the blond-haired man hide in the party?”. This particular question refers to an event that could have happened in the scene. However, the person did not hide anything.

The second questionnaire was asked a week later in the follow-up interview. This questionnaire was similar to the first questionnaire in relation to details except it included true or false questions. The false questions in the follow-up interview were depended on participants’ false answers from the first questionnaire. Specifically, the participants’ confabulated answers from the first interview were converted to true or false questions in the follow-up interview. These true or false questions were asked to examine if participants had

confused the confabulated answers from the week before for the experienced event, that is, whether they had created a false memory. The following is example of a true or false question: “What object did the blond-haired man hide in the party?”. If the participant answered “a beer” in the first interview than he would be given the following question a week later: “The blond-haired man hides a beer in the party – true or false?”. However, if the participants did not confabulate answers to the false questions they were given predetermined questions which were based on the questions from the first interview. Example: “The blond-haired man hides a gun in the party – true or false?”. For this particular question it was predetermined to use the word “gun” if the participant did not confabulate.

Design and Procedure

The data in this study was analyzed in a 2 time of interview (first vs. second interview) x 2 trait (high or low) x 2 gender (male vs. female) mixed design ANOVA for the optimism/pessimism dimensions separately. The experimenter asked the participants to come to an interview room situated in Reykjavik University at a predetermined time and date. They were tested individually in sessions that lasted for about 40 minutes. When the participants arrived they were told that this study was examining memory retrieval after watching emotional video clip. Then they received an informed consent form which included basic information about the study (See in Appendix 4). They were told that their participation was voluntary and they could withdraw participation without any consequences. When they had read the informed consent attentively and approved to participate, they were asked to sign it. Confidentiality and anonymity was ensured by giving each participant a code number. At that point the participants were first asked to fill out the Life Orientation Test-Revised and then the psychological questionnaire. When they finished answering these two tests the experimenter told them that they were going to watch a video clip and would have to answer questions about the clip afterwards. After watching the video clip, the experimenter administered the psychological questionnaire for the second time and asked the participants to

fill it out. Then the experimenter asked the participants to answer all the following questions about the video clip. If they did not know or remember the answer they were encouraged to guess.

After one week the participants were interviewed again. The experimenter either called the participants or met them in Reykjavik University. In the follow-up interview the experimenter asked the participants to answer true or false questions about the video clip.

Data scoring

In the first interview, the participants who confabulated to the false event questions were given a score of 1 and those who did not confabulate were given the score of 0. Similarly, participants who answered the true event questions correct were given the score of 1 but those who did not answer them correct were given the score of 0. In the second interview, participants who answered true in the true/false questions were given the score of 1 and those who answered false were given the score of 0. These scores were then converted into percentages.

The participants were divided into two groups on these two dimensions (optimism/pessimism) based on median split. Those who were above the median fell into the group “high level” and were given the score of 2 whereas those who were below the median fell into the group “low level” and were given the score of 1.

Results

The present study aims to examine if dispositional optimism or pessimism affects the creation of false memories and to determine if the effect is dependent on gender. A 2 time of interview (first vs. second interview) x 2 trait (high or low) x 2 gender (male vs. female) mixed ANOVA was used to analyze the data for the optimism and pessimism dimensions separately. The alpha level was set at .05.

Pessimism and false memory

Table 1 summarizes the descriptive statistics and shows the mean frequency of

confabulation to false-event questions and correct recall for the pessimism scale. In the first interview males with high level of pessimism confabulated answers to false-event questions in 88% of the cases and in the second interview 53% had created a false memory for the event they had confabulated about. Females with high level of pessimism confabulated answers in 68% of the cases in the first interview and 70% had confused the confabulated answers for the experienced event in the second interview. For the correct recall, males with high level of pessimism answered 84% correct in the first interview and 97% correct in the second interview whereas pessimistic females answered 95% correct in the first and second interview.

Table 1

Descriptive statistics for level of pessimism between male and female for false memories and correct recall for interview 1 and 2

	Gender	Pessimism	N	Mean (%)	SD (%)
False memories					
Interview 1					
	Male	High	8	87.5	13.4
		Low	11	61.4	25.9
	Female	High	10	67.5	29.0
		Low	11	63.6	30.3
Interview 2					
	Male	High	8	53.1	31.2
		Low	11	45.5	33.2
	Female	High	10	70.0	28.4
		Low	11	61.4	25.9
Correct recall					
Interview 1					
	Male	High	8	84.4	12.9
		Low	11	90.9	8.1
	Female	High	10	95.0	8.7
		Low	11	93.2	8.6
Interview 2					
	Male	High	8	96.9	5.8
		Low	11	95.5	8.4
	Female	High	10	95.0	8.7
		Low	11	94.3	8.6

The results from the 2 time of interview (first vs. second interview) x 2 trait (high or low) x 2 gender (male vs. female) mixed ANOVA revealed a significant main effect of time of interview on the false memory formation, $F(1, 36) = 6.309, p = .017$. Overall, participants confabulated at higher rate (68.8%) in the first interview compared to false events remembered in the second interview (57.5%). No other main effects were significant. The interaction between time of interview and gender on the false memory formation was significant, $F(1, 36) = 6.424, p = .016$. The interaction between time of interview and level of pessimism was not significant, $F(1, 36) = .472, p = .496$, as well as interaction between time of interview, gender and level of pessimism, $F(1, 36) = 1.360, p = .251$. As can be seen in figure 1, females confabulated and recalled the confabulation as a false memory at similar rate in the first and the second interview but males confabulated to false-event questions at higher rate in the first interview compared to recalling the confabulated answers as a false memory in the second interview. This difference was greatest for males with high level of pessimism. Follow-up independent t-test revealed a significant difference in confabulation between males with high level of pessimism ($M = .614, SE = .078$), and males with low level of pessimism in the first interview ($M = .875, SE = .047$), $t(17) = -2.600, p = .019$.

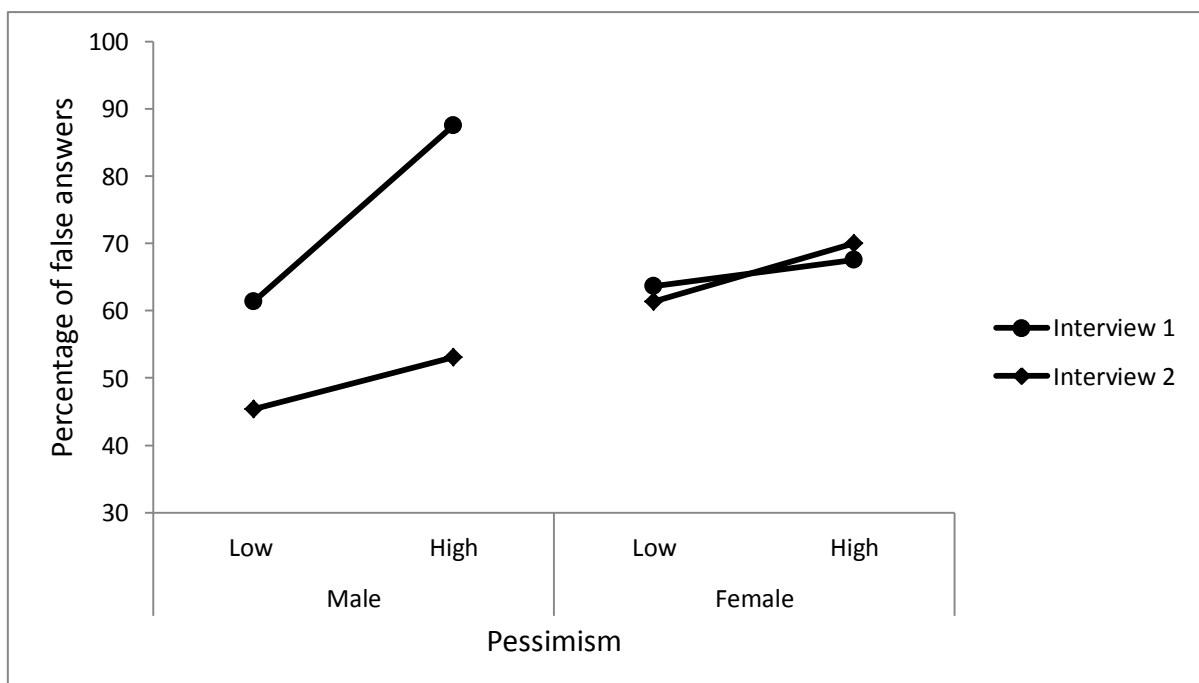


Figure 1. Percentage of false answers for males and females for interview 1 and 2.

Pessimism and correct recall

The results from the 2 time of interview (first vs. second interview) x 2 trait (high or low) x 2 gender (male vs. female) mixed ANOVA revealed a significant main effect of time of interview on the rates of correct recall, $F(1, 36) = 5.281, p = .027$. Overall, participants answered fewer questions correctly in the first interview (91,2%) but answered more questions correctly in the second interview (95,3%). No other main effects were significant. The interaction between time of interview and gender on the correct recall approached significance, $F(1, 36) = 4.043, p = .052$. No other interaction effects were significant. As can be seen in figure 2, females answered correct answers at similar rate during the first and the second interview but males answered more questions correctly in the second interview compared to the first interview. This difference was greatest for males with high level of pessimism.

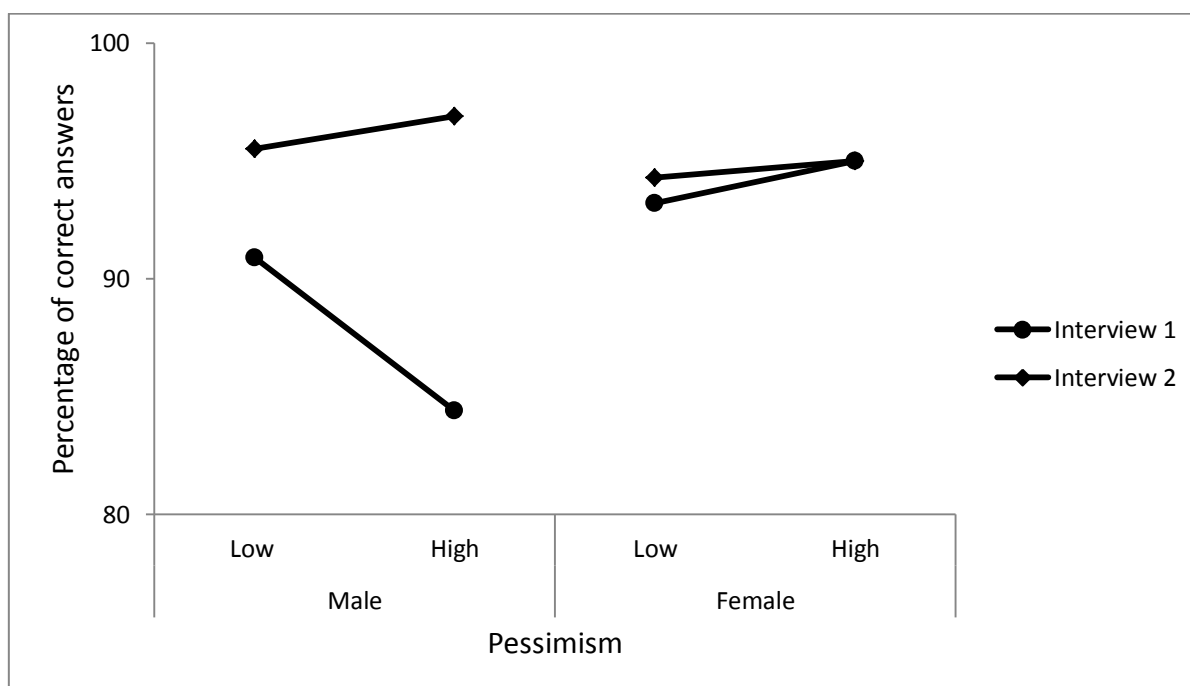


Figure 2. Percentage of correct answers for males and females for interview 1 and 2.

Optimism and false memory

Table 2 shows the mean frequency of confabulation to false-event questions and correct recall for the optimism scale. Males with low level of optimism confabulated answers to false-event questions in 82% of the cases in the first interview and in the second interview

36% had created a false memory about an event that did not happen. There was not much difference between the rate of confabulation and recalling the confabulation as a false memory in the second interview for males with high level of optimism. Females with low level of optimism confabulated answers in 69% of the cases in the first interview and 69% had created a false memory about an event that did not happen in the second interview. For the correct recall, males with high level of optimism answered 87% correct in the first interview and 96% correct in the second interview. Females answered 93% correct in the first interview and 92% in the second interview.

Table 2

Descriptive statistics for level of optimism between male and female for false memories and correct recall for interview 1 and 2

	Gender	Optimism	N	Mean (%)	SD (%)
False memories					
Interview 1					
	Male	High	12	66.7	24.6
		Low	7	82.1	23.8
	Female	High	9	61.1	35.6
		Low	12	68.8	24.1
Interview 2					
	Male	High	12	56.3	32.2
		Low	7	35.7	28.3
	Female	High	9	61.1	22.0
		Low	12	68.8	30.4
Correct recall					
Interview 1					
	Male	High	12	86.5	11.3
		Low	7	91.1	9.4
	Female	High	9	93.1	9.1
		Low	12	94.8	8.4
Interview 2					
	Male	High	12	95.8	8.1
		Low	7	96.4	6.1
	Female	High	9	91.7	10.8
		Low	12	96.9	5.7

The results from the 2 time of interview (first vs. second interview) x 2 trait (high or low) x 2 gender (male vs. female) mixed ANOVA revealed a significant main effect of time

of interview on the false memory formation, $F(1, 36) = 8.890, p = .005$. Main effect of gender was not significant, $F(1, 36) = .372, p = .546$, and main effect of optimism was also not significant, $F(1, 36) = .108, p = .744$. The interaction between time of interview and gender on the false memory formation was significant, $F(1, 36) = 8.890, p = .005$. The interaction between time of interview and level of optimism approached significance, $F(1, 36) = .3568, p = .067$, and the interaction between time of interview, gender and level of optimism also approached significance, $F(1, 36) = 3.568, p = .067$. As can be seen in figure 3, males confabulated to false-event questions at higher rate in the first interview compared to recalling the confabulated answers as a false memory in the second interview but females with high and low level of optimism confabulated and recalled the confabulation as a false memory at exact same rate in the first and the second interview. Moreover, males with low level of optimism were confabulating more than males with high level of optimism in the first interview but oppositely males with high level of optimism were recalling the confabulated answers as a false memory at higher rate than did males with low level of optimism in the second interview.

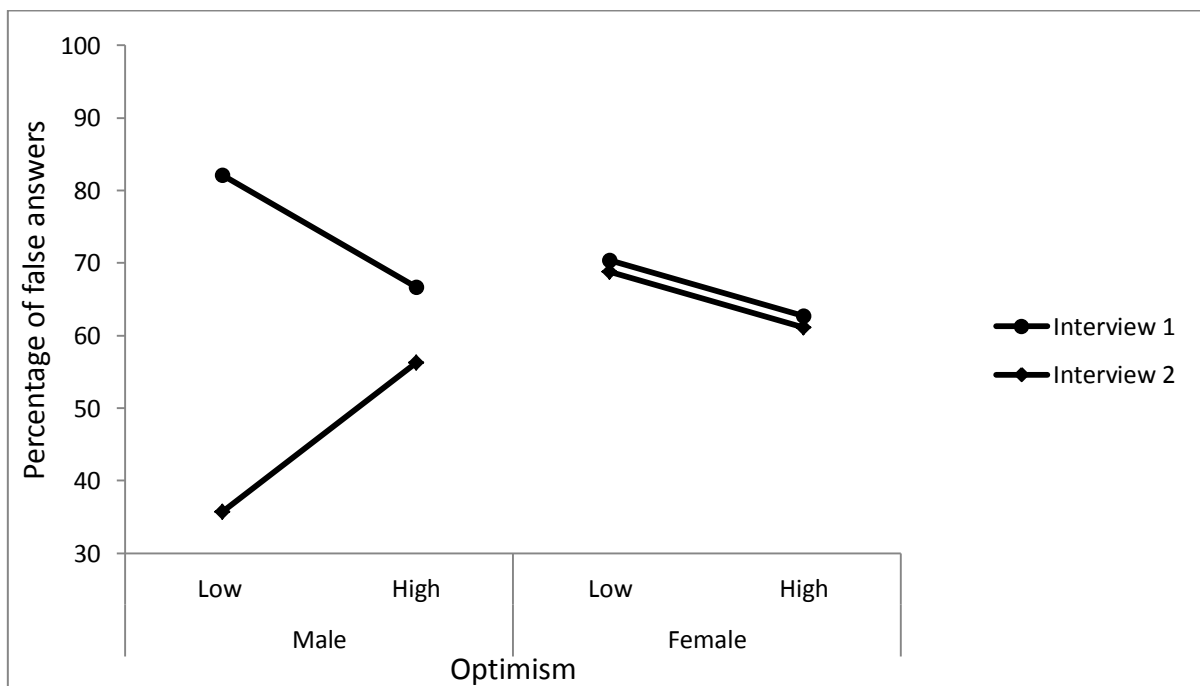


Figure 3. Percentage of false answers for males and females for interview 1 and 2.

Optimism and correct recall

The results from the 2 time of interview (first vs. second interview) x 2 trait (high or low) x 2 gender (male vs. female) mixed ANOVA showed that main effect of time of interview approached significance, $F(1, 36) = 3.569, p = .067$. No other main effects were significant. The interaction between time of interview and gender approached significance, $F(1, 36) = 2.956, p = .094$. No other interaction effects were found significant. As can be seen in figure 4, females answered correct answers at similar rate in the first and the second interview. However, males answered fewer questions correctly in the first interview but answered more questions correctly in the second interview.

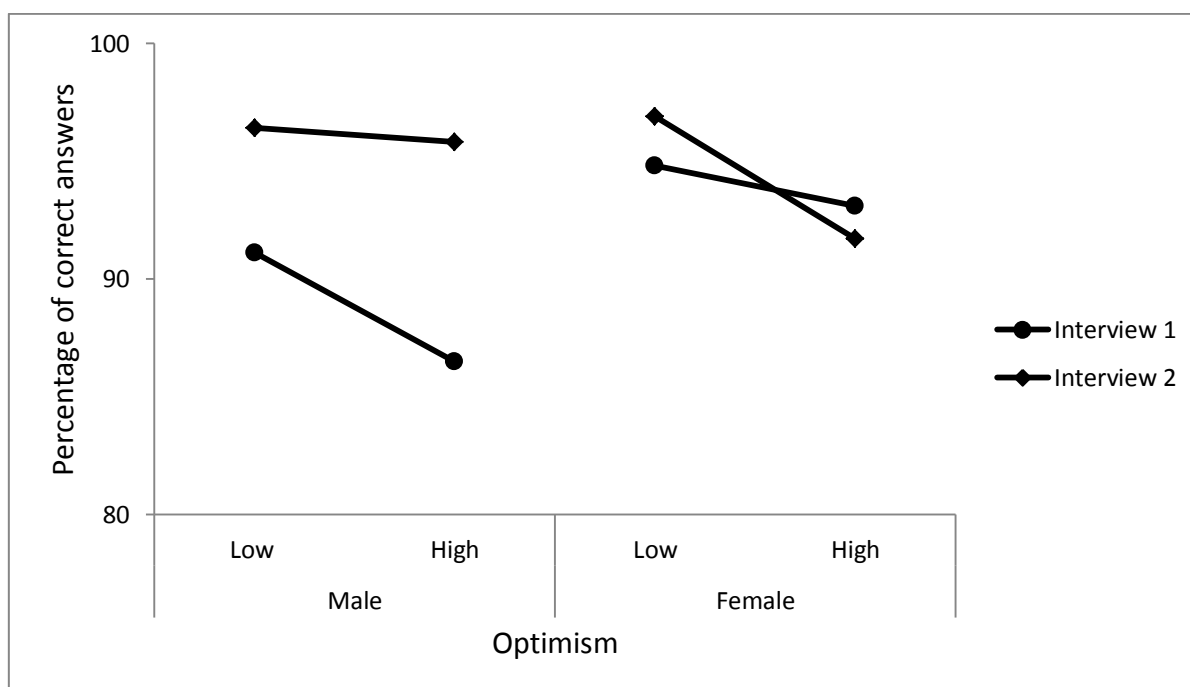


Figure 4. Percentage of correct answers for males and females for interview 1 and 2.

Psychological measures

Psychological measures were analyzed using dependent t-test. For two out of five questions participants did experience significantly greater emotions after seeing the negative emotional video. On average, participants were more calm in the first interview ($M = 3.78, SE = .145$) compared to the second interview ($M = 3.50, SE = 1.68$), $t(39) = 1.89, p = .054$. Participants were also more happy in the first interview ($M = 3.90, SE = .100$) compared to

second interview ($M = 3.43$, $SE = 1.07$), $t(39) = 5.42$, $p = .000$. Other psychological measures were not significant.

Discussion

The results showed a non significant main effect of optimism and pessimism on the false memory formation and correct recall. Main effect of time of interview on false memory formation and correct recall for pessimist and optimist dimension was significant or approached significance. The results for pessimist and optimist dimensions showed that interaction between time of interview and gender on the false memory formation and correct recall was either significant or approached significance. Additionally, a three-way interaction between time of interview, gender and level of optimism approached significance.

The hypothesis that optimists are more likely to elicit false memories than pessimists was therefore not supported. These results are interesting because as previously mentioned studies have demonstrated that certain personality traits and mood can influence people's susceptibility to misleading information (Frost et al., 2006; Storbeck & Clore, 2005). The incongruence between the results of Forgas et al. (2005) and the present study might be due to many factors. Forgas et al. used a photographic scene as a memory stimuli but this study used emotional video clip. Information recall from photographic scene is likely to be different from remembering information from a video clip because a video clip is more emotionally arousing and realistic compared to photographs. The present study examined if participants had recalled the confabulated answers as a false memory a week later but the study by Forgas et al. examined the creation of false memories 45 minutes after answering the questionnaire about the video. Furthermore, a total of 96 subjects participated in the study by Forgas et al. but 40 in the present study.

Although there was not a significant three-way interaction between time of interview, gender and level of pessimism/optimism on the false memory formation/correct recall, the statistical analysis indicated a trend towards interaction effects among these variables. The

difference between confabulation and recalling the confabulation as a false memory was greatest for males with high level of pessimism. Males with high level of pessimism were confabulating at higher rate than males that scored low on pessimism in the first interview but the difference between high and low pessimists in the second interview was less. A three-way interaction between time of interview, gender and level of optimism approached significance. Males with low level of optimism were confabulating more than males that scored high on optimism in the first interview but oppositely males with high level of optimism were recalling the confabulated answers as a false memory at higher rate than did males with low level of optimism in the second interview. With more participants it is possible that this difference would have been significant. These results are interesting because participants with low level of optimism and high level of pessimism were confabulating at a high rate in the first interview but studies which have examined the association between mood and false memories have demonstrated that positive mood increase while negative mood decrease the susceptibility to remember misleading details (Forgas et al. 2005; Storbeck & Clore, 2005).

Furthermore, the results indicated that gender was producing false memory differently depending on time of interview. The results for pessimist and optimist dimensions showed that interaction between time of interview and gender on the false memory formation was significant. For the pessimism dimension and false memory, males confabulated to false-event questions at a high rate in the first interview but were recalling the confabulated answers as a false memory at much lower rate in the second interview. Females were more stable as they confabulated and recalled the confabulation as a false memory at similar rate in the first and the second interview. For the optimism dimension and false memory, males confabulated to false-event questions at a high rate in the first interview but were recalling the confabulated answers as a false memory at much lower rate in the second interview. Females confabulated and recalled the confabulation as a false memory at exact same rate in the first and second interview. The second hypothesis that male participants will create more false

memories than female participants was therefore partially supported. This result is somewhat in line with earlier findings on memory which have demonstrated a significant relationship between gender and memory performance (Herlitz et al., 1997; Herlitz & Rehnman, 2008; Lowe et al., 2003). The findings of Herlitz et al., (1997) is one of many studies which has shown a significant difference between male and females where women performed better than men on episodic memory tasks. Males' lower performances are in accordance with the results of the present study as males were more susceptible to false memory formation compared to females in the first interview.

The findings from the present study is not consistent with the study by Bauste and Ferraro (2004) who examined if false memory production was different between males and females. Their results demonstrated a non significant main effect of gender on the false memory production or interaction effect involving gender. As previously mentioned, Bauste and Ferraro (2004) used the Deese/Roediger McDermott (DRM) word list paradigm to assess episodic memory. Using a word list as stimuli could be considered as a shortcoming and might explain their insignificant results. Episodic memory enables individuals to remember unique, personal experiences from the past (Tulving, 2002) and therefore it is more likely that other stimuli, as watching a video clip and answering questions about it later on, would be more suitable when assessing episodic memory.

The results also indicated that gender was answering correct answers differently depending on time of interview. The results for pessimist and optimist dimensions showed that interaction between time of interview and gender on the correct recall approached significance. For the pessimism dimension and correct recall, males answered fewer questions correct in the first interview compared to the second interview, but females were more stable as they answered correct answers at similar rate during the first and the second interview. The difference between correct recall in the first interview and correct recall in the second interview was greatest for males with high level of optimism. For the optimism dimension

and correct recall, females answered correct answers at similar rate in the first and the second interview. However, males answered fewer questions correctly in the first interview but answered more questions correctly in the second interview. These findings are in line with earlier studies which have demonstrated a gender differences in memory performance (Herlitz & Rehnman, 2008; Lowe et al. 2003).

The results from the dependent t-test showed that participants did experience significantly greater emotions after seeing the negative emotional video for two out of five questions. Participants were more calm and happy in the first interview compared to the second interview. This demonstrates that the negative emotional video clip had a considerable impact on participants' feelings.

Limitations of the study are that it does not have enough statistical power because of a small sample size. Few participants might be the reason why there was not a significant impact of optimism/pessimism on the false memory formation or correct recall and for the insignificant two or three way interaction affects. Another limitation is that the participants' answers to the Life orientation test and psychological measures are based on subjective evaluation. Hence, it is not clear that their answers reflected their behavior and feelings in the real life. These limitations can influence both the results of the research and the generalizability to the population.

Future studies would have a great scientific importance as researchers would get more insight into the false memory phenomenon, and especially how optimism and pessimism might affect the false memory formation. In that case, it would be interesting to continue to examine if dispositional optimism or pessimism affects the creation of false memories and to determine if the effect depends on gender when using not only negative emotional video clip but also neutral video clip. By studying this phenomenon sufficiently, researchers can determine the occurrence of false memory and tried to prevent them in various situations. Scientific knowledge about false memory formation is important and can for example be

applied to any situations concerning human welfare, such as criminal investigations, where witnesses may have to rely on their memory when testifying against someone in court.

References

- Ackil, J. K., & Zaragoza, M. S. (1998). Memorial consequences of forced confabulation: Age differences in susceptibility to false memories. *Developmental Psychology*, 34(6), 1358–1372. doi:10.1037/0012-1649.34.6.1358
- Bauste, G., & Ferraro, F. R. (2004). Gender differences in false memory production. *Current Psychology*, 23(3), 238–244. doi:10.1007/s12144-004-1023-0
- Brissette, I., Scheier, M. F., & Carver, C. S. (2002). The role of optimism in social network development, coping, and psychological adjustment during a life transition. *Journal of Personality and Social Psychology*, 82(1), 102–111. doi:10.1037/0022-3514.82.1.102
- Chang, E. C., D’Zurilla, T. J., & Maydeu-Olivares, A. (1994). Assessing the dimensionality of optimism and pessimism using a multimeasure approach. *Cognitive Therapy and Research*, 18(2), 143–160. doi:10.1007/BF02357221
- Dunn, J., Occhipinti, S., Campbell, A., Ferguson, M., & Chambers, S. K. (2011). Benefit finding after cancer. The role of optimism, intrusive thinking and social environment. *Journal of Health Psychology*, 16(1), 169–177. doi:10.1177/1359105310371555
- Forgas, J. P., Laham, S. M., & Vargas, P. T. (2005). Mood effects on eyewitness memory: Affective influences on susceptibility to misinformation. *Journal of Experimental Social Psychology*, 41(6), 574–588. doi:10.1016/j.jesp.2004.11.005
- Frost, P., Sparrow, S., & Barry, J. (2006). Personality characteristics associated with susceptibility to false memories. *The American journal of psychology*, 193–204.
- Gallo, D. A., Foster, K. T., & Johnson, E. L. (2009). Elevated false recollection of emotional pictures in young and older adults. *Psychology and Aging*, 24(4), 981–988. doi:10.1037/a0017545
- Herlitz, A., Nilsson, L. G., & Bäckman, L. (1997). Gender differences in episodic memory. *Memory & Cognition*, 25(6), 801–811. doi:10.3758/BF03211324

- Herlitz, A., & Rehnman, J. (2008). Sex differences in episodic memory. *Current Directions in Psychological Science*, 17(1), 52–56. doi:10.1111/j.1467-8721.2008.00547.x
- Herzberg, P. Y., Glaesmer, H., & Hoyer, J. (2006). Separating optimism and pessimism: A robust psychometric analysis of the Revised Life Orientation Test (LOT-R). *Psychological Assessment*, 18(4), 433–438. doi:10.1037/1040-3590.18.4.433
- Hess, T. M., Popham, L. E., Emery, L., & Elliott, T. (2012). Mood, motivation, and misinformation: Aging and affective state influences on memory. *Aging, Neuropsychology, and Cognition*, 19(1-2), 13–34.
doi:10.1080/13825585.2011.622740
- Loftus, E. F., & Pickrell, J. E. (1995). The formation of false memories. *Psychiatric Annals*, 25(12), 720–725.
- Lowe, P. A., Mayfield, J. W., & Reynolds, C. R. (2003). Gender differences in memory test performance among children and adolescents. *Archives of Clinical Neuropsychology*, 18(8), 865–878. doi:10.1016/S0887-6177(02)00162-2
- Otgaar, H., Candel, I., & Merckelbach, H. (2008). Children's false memories: Easier to elicit for a negative than for a neutral event. *Acta Psychologica*, 128(2), 350–354.
doi:10.1016/j.actpsy.2008.03.009
- Porter, S., Bellhouse, S., McDougall, A., ten Brinke, L., & Wilson, K. (2010). A prospective investigation of the vulnerability of memory for positive and negative emotional scenes to the misinformation effect. *Canadian Journal of Behavioural Science*, 42(1), 55–61. doi:10.1037/a0016652
- Porter, S., Spencer, L., & Birt, A. R. (2003). Blinded by emotion? Effect of the emotionality of a scene on susceptibility to false memories. *Canadian Journal of Behavioural Science*, 35(3), 165–175. doi:10.1037/h0087198

Robinson-Whelen, S., Kim, C., MacCallum, R. C., & Kiecolt-Glaser, J. K. (1997).

Distinguishing optimism from pessimism in older adults: Is it more important to be optimistic or not to be pessimistic? *Journal of Personality and Social Psychology*, 73(6), 1345–1353. doi:10.1037/0022-3514.73.6.1345

Roediger, H. L., & McDermott, K. B. (1995). Creating false memories: Remembering words not presented in lists. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 21(4), 803–814. doi:10.1037/0278-7393.21.4.803

Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the Life Orientation Test. *Journal of personality and social psychology*, 67(6), 1063.

Storbeck, J., & Clore, G. L. (2005). With sadness comes accuracy; with happiness, false memory. Mood and the false memory effect. *Psychological Science*, 16(10), 785–791.

Tulving, E. (2002). Episodic memory: From mind to brain. *Annual Review of Psychology*, 53(1), 1–25. doi:10.1146/annurev.psych.53.100901.135114

Zaragoza, M. S., Payment, K. E., Ackil, J. K., Drivdahl, S. B., & Beck, M. (2001).

Interviewing witnesses: Forced confabulation and confirmatory feedback increase false memories. *Psychological Science*, 12(6), 473–477. doi:10.1111/1467-9280.00388

Appendix 1.

Life Orientation Test-R (Scheier, Carver & Bridges, 1994).

Merktu við hversu ósammála eða sammála þú ert eftirfarandi fullyrðingum með því að draga hring um viðeigandi númer

	Mjög ósammála	Ósammála	Hlutlaus	Sammála	Mjög sammála
1. Á óvissutímum á ég alltaf von á hinu besta.	0	1	2	3	4
2. Ef eitthvað getur farið úrskaiðis hjá mér þá mun það gerast.	0	1	2	3	4
3. Ég er alltaf bjartsýn/n á fram tíð mína	0	1	2	3	4
4. Ég á sjaldan von á því að hlutirnir gangi mér í hag.	0	1	2	3	4
5. Ég á sjaldan von á því að góðir hlutir hendi mig.	0	1	2	3	4
6. Almennt á ég von á því að góðir hlutir hendi mig frekar en slæmir.	0	1	2	3	4

Appendix 2.

Hér á eftir eru orð sem lýsa tilfinningum fólks.

Vinsamlegast **DRAGÐU HRING** um tölugildið sem lýsir best styrk hvernar tilfinningar miðað við það **hvernig þér líður núna.**

	Alls ekki				Mjög
Afslöppuð/Afslappaður	1	2	3	4	5
Kvíðin (n)	1	2	3	4	5
Óörugg (ur)	1	2	3	4	5
Glöð/Glaður	1	2	3	4	5
Áhyggjufull (ur)	1	2	3	4	5

Appendix 3.**Spurningar við myndbrot úr Sons of Anarchy- fyrsta viðtal.**

1. Allir meðlimir mótorhjólagentisins voru í eins vesti, hvernig var vestið á litinn?
2. Hvar voru persónurnar staddar í byrjun myndbrotsins?
3. Hvað gerði fólkið í partíinu þegar að ungbarnið ropaði?
4. Hvað gerði dökkhærða stelpa í kjölfar þess að slá ljóshærða manninn í partíinu?
5. Hvaða hlut faldi ljóshærði maðurinn í partíinu?
6. Hvað var Ryan Gosling að leika í myndbrotinu?
7. Árásarmaðurinn átti að drepa manninn, en skaut óvart konuna hans. Afhverju var það?
8. Hvaða hlut afhenti lögreglumaðurinn gamla mótorhjóla manninum fyrir utan húsið?
9. Hvernig ökutæki var árásarmaðurinn að keyra þegar hann skaut konuna?
10. Hvað átti konan sem var myrt mörg börn sem voru aftur í bílnum?
11. Vitnið að glæpnum var úti að labba með hvaða dýr?
12. Hvað gaf lögreglustjórinn til kynna við gamla mótorhjólmanninn þar sem morðið var framið?

Spurningar við myndbrot úr Sons of Anarchy- annað viðtal

1. Var vestið hjá mótorhjólagenginu rautt á litinn?
2. Fólkið var í statt í partýi í byrjun myndbrotsins?
3. Fólkið _____ þegar ungbarnið ropaði í partýinu?
4. Dökkhærða stelpa strunsaði út úr partýinu eftir að hún sló ljóshærða manninn?
5. Lóshærði maðurinn faldi _____ í partýinu?
6. Ryan gosling var að leika _____ í myndbrotinu?
7. Árásarmaðurinn átti að drepa manninn en skaut óvart konuna hans?
8. Lögreglumaðurinn afhenti gamla mótorhjólmanninum _____ fyrir utan húsið?
9. Árásarmaðurinn var að keyra á mótorhjólum er hann skaut konuna?
10. Konan sem var myrt átti þrjú börn?
11. Vitnið að glæpnum var úti að labba með kött?
12. Gamli lögreglumaðurinn gaf til kynna að röng manneskja hefði verið myrt á morðstaðnum?

Ef ekkert svar kom frá þátttakanda

Nr. 3 – Fór að hlæja

Nr. 5 – Byssu

Nr. 6 – Lögreglumann

Nr. 8 – Síma

Appendix 4.**Upplýst samþykki****Persónuleikaeinkenni og minni einstaklinga af myndbroti**

Þér er boðið að taka þátt í rannsókn. Áður en þú tekur ákvörðun um þátttöku er mikilvægt að þú vitir út á hvað rannsóknin gengur. Eftirfarandi texti mun útskýra það og hvert markmið rannsóknarinnar er. Ef þú tekur ákvörðun um að taka þátt, verður þú beðin(n) um að skrifa undir upplýst samþykki. Ef þú hefur einhverjar spurningar um eitthvað sem þú ert ekki viss um, mun ég góðfúslega svara þínum spurningum. Taktu þinn tíma til að lesa þessar upplýsingar. Þú skalt aðeins samþykkja að taka þátt í rannsókninni ef þér finnst þú skilja hvað er verið að biðja þig um og þér finnst þú hafa fengið nægan tíma til að taka ákvörðun um þátttöku.

Tilgangur rannsóknar þessarar er að skoða minni einstaklinga og hversu vel þátttakendur muna atriði í ákveðnu myndbroti. Einnig verður lagt fyrir persónuleikapróf og spurningar er varða lífsafstöðu og líðan. Reiknað er með því að um 40 þátttakendur taki þátt í rannsókninni, flestir nemendur í Háskólanum í Reykjavík.

Það er undir þér komið að ákveða hvort þú viljir taka þátt, en ef þú ákveður að taka þátt verður þú beðin(n) um að skrifa undir upplýst samþykki eftir að hafa lesið þessar upplýsingar. Ef þú ákveður að taka þátt er þér frjálst að hætta þátttöku hvenær sem er og án þess að gefa einhverja ástæðu fyrir því. Að hætta þátttöku í rannsókninni mun ekki hafa neinar afleiðingar í för með sér fyrir þig.

Með því að taka þátt í rannsókninni ertu boðin(n) í viðtal í viðtalsherbergi staðsett í Háskólanum í Reykjavík. Rannsóknin felst í því að þú takir stutt persónuleikapróf og horfir á 10 mínútna myndband úr bandarískum sjónvarpsþætti. Að því loknu verður þú beðin(n) um að svara nokkrum spurningum af rannsakanda. Eftir viku mun rannsakandi aftur hafa samband við þig og spyrja nokkura aukaspurninga, en þá þarftu ekki að koma í sama viðtalsherbergi aftur heldur í samkomulagi við rannsakanda, hittast á einhverjum stað eða viðtal skal tekið í gegnum síma.

Þátttaka í rannsókninni mun taka að minnsta kosti 30 mínútur og í mesta lagi 40 mínútur. Seinna viðtalið mun vera styttra og aðeins 4-5 mínútur. Þátttaka þín samanstendur af þessum tveimur viðtalstímum.

Það eru engar áhættur við það að taka þátt í rannsókninni. Þegar rannsókn líkur stendur þér til boða að nálgast meginniðurstöður rannsóknarinnar hjá rannsakanda. Þetta verða almennar niðurstöður fyrir þátttakendahópinn en ekki einstaklings niðurstöður.

Þér er frjálst að hætta þátttöku hvenær sem er meðan á rannsókn stendur án þess að það hafi neinar afleiðingar í för með sér. Ef þú hefur einhverjar fleiri spurningar og vilt spyrja síðarmeir getur þú haft samband við rannsakanda, Arnar Ingi Friðriksson í síma: 8481553. Ef þú hefur einhverjar áhyggjur varðandi þessa rannsókn og vilt spyrja einhvern í trúnaði, getur þú haft samband við: Kamilla Rún Jóhannsdóttir, Sálfræðisvið, Háskólinn í Reykjavík.

Samþykkisblað

Titill á rannsókn: _____

Nafn á rannskanda: _____

Vinsamlegast hakaðu við boxið

1. Ég staðfesti að ég hef lesið upplýsingablaðið fyrir ofangreinda rannsókn ☐
og hef fengið tækifæri til að spyrja spurninga.
2. Ég skil upplýsingarnar og hef fengið nægan tíma til að velta þeim fyrir mér ☐
3. Ég skil að þátttaka mín er sjálfboðin og að mér er frjálst að draga mig út úr ☐
rannsókn hvenær sem er, án þess að þurfa að gefa upp ástæðu fyrir því.
4. Ég samþykki að taka þátt í ofangreindri rannsókn ☐

Nafn á þátttakanda_____
Dagsetning_____
Undirskrift_____
Rannsakandi_____
Dagsetning_____
Undirskrift