



The Relationship between Positive and Negative Personality Traits and Cognitive Performance: Memory and Attention

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Foreword

Submitted in partial fulfilment of the requirements of the BSc Psychology degree, Reykjavik University, this thesis is presented in the style of an article for submission to a peer-reviewed journal.

Abstract

Previous studies indicate that certain personality traits have an effect on cognitive performance. The aim of this study was to examine if positive and negative personality traits affects our memory and attention. Participants in the study (N=40) were divided into high and low positive groups and high and low negative groups using median split. The Positive and Negative Affect Schedule questionnaire (PANAS) was used to measure positive and negative personality traits. Two cognitive tasks were used, a wordlist memory task where participants were asked to write down as many words as they could remember and a Stroop task, both original and emotional Stroop. The main hypotheses were that those who have more negative traits (low positive or high negative) would focus on and remember more negative words and those who have more positive trait (high positive or low negative) would focus on and remember more positive words. Results did not support the hypothesis, the expected difference between positive and negative traits was not found. The results however, revealed that high positive participants performed significantly worse on all the Stroop tasks compared to low positive participants. No main effects or interactions were found for the memory test.

Útdráttur

Fyrri rannsóknir gefa til kynna að ákveðnir persónuleikaeiginleikar hafa áhrif á hugræna frammistöðu. Tilgangur rannsóknarinnar var að skoða hvort jákvæðir og neikvæðir persónuleikaeiginleikar hafa áhrif á minni okkar og athygli. Þátttakendum í rannsókninni (N=40) var skipt í háa og lága jákvæða hópa og háa og lága neikvæða hópa með miðjuskiptingu. The Positive and Negative Affect Schedule spurningalisti (PANAS) var notaður til að mæla jákvæða og neikvæða persónuleikaeiginleika. Tvö hugræn verkefni voru notuð, orðalista minnispróf þar sem þátttakendur voru beðnir um að skrifa niður eins mörg orð og þeir mundu og Stroop próf, bæði upprunalega og tilfinninga Stroop. Aðal tilgátur voru að þeir sem höfðu meiri neikvæða eiginleika (lágir jákvæðir eða háir neikvæðir) myndu einblína á og muna fleiri neikvæð orð og þeir sem höfðu meiri jákvæða eiginleika (háir jákvæðir eða lágir neikvæðir) myndu einblína á og muna fleiri jákvæð orð. Niðurstöður studdu ekki tilgátuna, áætlaður munur á milli jákvæðra og neikvæðra eiginleika fannst ekki. Niðurstöðurnar samt sem áður leiddu í ljós að háir jákvæðir þátttakendur stóðu sig marktækt verr á öllum Stroop verkefnum samanborið við lága jákvæða þátttakendur. Engin meginhrif fundust á milli hópanna á minnisverkefninu.

The Relationship between Positive and Negative Personality Traits and Cognitive Performance: Memory and Attention

Personality traits have been divided into two broad categories in the literature, positive and negative personality traits (Crawford & Henry, 2004). These two different poles of personality traits have been shown to affect the function of our various cognitive systems such as memory (Brose, Lövdén & Schmiedek, 2014; Graham & Lachman, 2014; Li, Chan & Luo, 2010; Riediger, Wrzus, Schmiedek, Wagner & Lindenberger, 2011; Storbeck & Watson, 2014) and attention (Becker & Leininger, 2011; Caseras, Garner, Bradley & Mogg, 2007; Derryberry & Reed, 1994; Koster, De Raedt, Goeleven, Franck & Crombez, 2005; Segerstrom, 2001; Thomas & Hasher, 2006). However, the results of studies vary and it is still not very well understood how positive and negative traits affect cognitive performance.

Findings from an interesting study by Brose, Lövdén and Schmiedek (2014) showed that participants were more motivated to complete a task when they felt happier and more positive. Participants performed several cognitive tasks including spatial, verbal and numerical working memory tasks. Participant also had to report their feelings at each time when they were performing a task. Another study done by Riediger, Wrzus, Schmiedek, Wagner and Lindenberger (2011) was examining hedonic lifestyle of participants and their working memory performance. A hedonic lifestyle can be described as living a fulfilling and a happy life where a person feels satisfied with life's choices and outcomes. Their findings showed that those who reported not having a hedonic lifestyle performed much worse on the working memory task compared to the others that reported having a hedonic lifestyle. Li, Chan and Luo did an experiment in 2010 with the aim to see if negative emotion would have an effect on individuals' performance on spatial and verbal working memory tasks. While participants were performing

the tasks the investigators measured participants' response to neutral or negative stimuli using ERP. They divided participants into two groups, a negative condition with negative pictures such as pointing a gun and neutral condition with neutral pictures of landscape for example. They measured participants' positive and negative traits by using the PANAS questionnaire after the experimental procedure. They found out that participants in the negative stimuli condition had more negative emotions (negative PANAS scores increased) than those in the neutral condition (positive PANAS scores decreased). Furthermore, response time on the cognitive tasks was worse for participants in the negative stimuli condition.

Even though some studies indicate that people with negative trait perform worse than those with positive trait, other studies have implied that perhaps the decrement in performance is caused by attentional bias where negative stimuli cause interference for negative trait people and then possibly positive stimuli cause interference for positive trait people. Caseras, Garner, Bradley and Mogg (2007) studied dysphoria in participants and their outcomes on cognitive tasks assessing attention. Dysphoria means feeling really bad and is the opposite of euphoria, feeling really good. They used the BDI (Beck depression inventory) questionnaire which measures depression. They divided participants into two groups, those who scored high on the BDI considered as dysphoric and those who scored low were non-dysphoric. Participants had to perform a task where they evaluated positive, negative or neutral picture-pairs stimuli. Results showed that participants who were dysphoric focused their attention longer on negative pictures compared to those who were not dysphoric. A study conducted by Koster, De Raedt, Goeleven, Franck and Crombez (2005) showed similar results. They assessed participants with dysphoria and tested attention by showing participants negative, positive and neutral words in a cuing task. Participants were supposed to respond as quickly as possible to the emotional or neutral words

appearing on a screen. The results showed that those who were dysphoric focused their attention longer on negative words opposed to the participants with no dysphoria who focused their attention more on positive words. A study made by Segerstrom (2001) was focusing on the relationship between optimism and attentional bias and the results showed that the optimistic participants had more attentional bias towards positive words on an emotional Stroop task compared to negative attentional bias which decreased.

Derryberry and Reed (1994) conducted a research on introverts and extroverts to see if they had attentional biases towards negative or positive stimuli. They submitted several personality questionnaires to divide participants into these two categories of introverts and extroverts. Being an introvert means that the person was more anxious, neurotic and had more negative traits than extroverts which were more stable, outgoing and did not have these negative traits. Positive and negative conditions were measured in response time where participant would respond fast to cues on screen and gain points (positive) or respond slow and lose points (negative). Cues appeared on a screen and then a word in a box both on the right and left side of the screen, left box was assigned to negative value and right box to positive. After that participants automatically either focused on the left (positive) or right (negative) box when they had gone through the trial. Participants' who were extroverts had attentional bias towards positive direction and focused longer on it than introverts.

An interesting study made by Becker and Leininger in 2011 was administered with the aim to see how and if mood would affect attention. Participants' mood was manipulated into either positive, negative or a neutral mood where an attention task was submitted following the mood manipulation where participants had to write down neutral, positive or negative things. Pictures of faces with different expressions were used and the results showed that the

relationship between negative mood and negative pictures on the task was significant but no results were found for positive mood. Tamir and Robinson (2007) did five studies about positive mood and selective attention to examine the positive effect and their results showed attentional bias towards positive stimuli for positive mood. Tamir and Robinson (2007) thought that positive mood predicted positive bias very strongly, even stronger than negative mood predicts bias towards negative stimuli. These two studies show adverse results which may be caused by different definitions of mood or because of different methods used in each experiment. The former study by Becker and Leininger (2011) showed negative attentional bias while the study by Tamir and Robinson (2007) showed positive attentional bias. Becker and Leininger (2011) did their experiment in response to Tamir and Robinson's 2007 experiment with the aim to show that attentional bias can be both negative and positive. Tamir and Robinson (2007) were mostly focusing on rewarding stimuli and positive mood but found a vague relationship between negative mood and attentional bias. They suggested that additional research is needed to better understand the relation between bias and mood.

Wadlinger and Isaacowitz (2006) did a research concerning positive affect and attention by using mood induction and positive, negative and neutral images as stimulus. Results showed that those who had been in the positive mood condition rather focused their attention on the positive emotion images. Interestingly enough there was no negative effect of the negative mood induction on the negative pictures. As such, the results demonstrate positive bias but not negative bias. The reason could be that the positive emotion images were of infant children smiling which produced a very positive effect but the negative emotion images were not that affecting because they included pictures of garbage and such like.

Although the hypotheses regarding positive and negative attentional bias has received much support there are also studies showing different results regarding positive and negative traits (mood) and cognition. Phillips, Bull, Adams and Fraser for example did a very interesting research in 2002 concerning positive mood and executive function. While other studies had shown how positive mood enhances cognitive performance, Phillips et al. demonstrated different conclusions from their study where positive mood impaired cognitive performance. They used a mood self-assessment questionnaire to divide participants into neutral and happy mood conditions. The Stroop task was used to measure cognitive performance. Results showed that those who were in the happy group performed slower on the Stroop task than those in the neutral group. They discussed that these results might be because positive individuals are more likely to be drifting in an attention task like Stroop and also that they might be less motivated for such a task compared to real life conditions. Another explanation might be that the positive individuals might have become distracted by their happy mood and thoughts while performing the task where they had to concentrate and be focused. It should be noted that the positive mood was compared to neutral mood but not negative mood.

In summary, previous studies suggest interference from stimuli that fits traits or mood but research has also shown that both negative trait and mood as well as positive mood can overall decrease cognitive performance. One of the issues in this field is that studies are using different measures of cognitive performance often focused only on attention. Furthermore, sometimes studies are measuring trait and sometimes mood and how trait is measured varies. Few studies in the field have for example used The Positive and Negative Affect Schedule questionnaire (PANAS) designed to measure positive and negative traits (Crawford & Henry, 2004). More

research is needed in order to better understand whether positive and negative personality traits cause attentional bias that fits the trait.

The aim of the study was to test the interference hypothesis – that is negative will have more interference from negative stimuli and positive will have more interference from positive stimuli. The study will examine cognitive performance more broadly by using both attention based and memory tasks. PANAS will be used for measuring traits and participants scores on both the positive and negative dimension (high and low on each dimension) analysed.

Method

Participants

A total of 40 students from the first and second year of the psychology department at the Reykjavik University, participated in this study. Participants' age ranged from 18-60 years old (M=20-25). Participants were recruited from the Research Participant Pool of the psychology undergraduate program as well as from the university student population in general. All participants were asked to sign an informed consent form before the experiment started. There were no criteria for participants to be included or excluded from the experiment except for participants to be native Icelandic speakers. The participants from the Research Participant Pool received credits for their participation.

Apparatus and measures

Panas questionnaire. The Positive and Negative Affect Schedule questionnaire (PANAS) was used to measure positive and negative emotional states for the past two weeks (Crawford & Henry, 2004). The questionnaire consists of 20 questions where 10 questions are positive and 10 are negative (see Appendix B, p. 26). Participants answered adjectives and valued how well they matched their feelings for the past two weeks. The answers were scored on

a five point likert scale. The 10 negative words are “anguished, unhappy, guilty, frightful, hostile, sensitive, ashamed, nervous, tense and scared”. The 10 positive words are “interested, excited, strong, enthusiastic, proud, vigilant, inspired, determined, observing and active”. For every question there are 5 options, 1 equals “never”, 2 “rarely”, 3 “neither nor”, 4 “often” and 5 “always”. All of the words were translated into Icelandic and backtranslated (see Appendix B, p. 26).

Memory task. The memory task consisted of a wordlist task with 16 words. 4 words were positive, 4 words were negative and 8 words were neutral (see Appendix C, p. 28). The experimenter made up and arranged the wordlist memory task from the ground and followed certain rules about word length, syllables and pronunciation.

Stroop task. The attention task that was used was the Stroop task which was measured with timing how long participants would identify the colors of the words (Jensen & Rohwer Jr., 1966). Both original and emotional Stroop tasks were used in the study. A stopwatch was used to measure timing. The original Stroop was used first and appeared on the first two slides of the slideshow. It consisted of 32 words in five different colors and the colors were yellow, red, green, blue and black. The first slide consisted of words of colors in the same color as the word, 100% consistency and second slide with 32 words of colors never in the same color as the word, 100% inconsistency. An example of 100% consistency was if the word “red” was in the color red and the word “black” was in the color black. An example of 100% inconsistency was if the word “red” was in the color blue and the word “black” was in the color yellow and so forth. The next three slides were the emotional Stroop with 32 neutral words, 32 positive words and 32 negative words (see Appendix D, p. 29). The Stroop task was presented in six different orders with always the same first two types in the beginning with 100% consistency and inconsistency. The next

three types were presented in six different ways where Stroop 1 was neutral, negative, positive; Stroop 2 was negative, neutral, positive; Stroop 3 was positive, negative, neutral; Stroop 4 neutral, positive, negative; Stroop 5 negative, positive, neutral, Stroop 6 positive, neutral, negative. The words in the Stroop test were selected and arranged by the experimenter.

Experimental design

The data from the Stroop tasks was analysed in two 2 trait (high and low) x 5 Stroop (consistency, inconsistency, positive, neutral and negative) mixed ANOVAs for positive and negative trait separately. The data from the memory task was analysed in two 2 trait (high and low) x 3 wordlist memory task (positive, neutral and negative) mixed ANOVAs for positive and negative traits separately. Follow up comparisons with post hoc test were done using Bonferoni. The independent variables were the negative and positive personality traits and type of cognitive stimuli (task) and the dependent variable was participants' performance on the cognitive tasks. Given that the hypothesis was directional the p value was divided by two.

Procedure

The experiment took place in one of the classrooms in Reykjavik University. Only the experimenter and one participant were in the classroom at each time. The tasks were submitted to one individual at a time. Experimenter started by explaining the study and the participant then assigned an informed consent form. Participants were told that they could withdrawal from the experiment at any given time without having to give an explanation or receive penalty for it.

Participants started by answering PANAS questionnaire which measures positive and negative personality traits. The PANAS contained 20 questions about peoples' well-being over the last couple of weeks. The questions in the questionnaire contained both negative and positive emotional states. Participants were split into two same size groups based on what they answered

on the PANAS questionnaire. Half of the participants were in the high negative state group and the other half in the high positive state group.

Next step was to submit the memory task. The memory task was presented on a computer screen in a PowerPoint slideshow. In the slideshow 16 words appeared where each word was presented individually on one slide and the slides rolled continuously forward with two seconds interval between each word. Thereafter participants were told to write down as many words as they could remember in whichever order they would remember them in. Participants had one minute after the slideshow to recollect the words they remembered and experimenter took the time with a stopwatch. Experimenter told participants when they should start write down words immediately after the slideshow finished and also let them know when the minute was up and they had to stop writing.

Participants were then told that the final step was to assess their attention. Experimenter explained how the Stroop task would work. There were five different slides with 32 words on each slide in five different colors, yellow, red, green, blue and black. First slide had 32 words of colors that were in 100% consistency and the second slide was with 32 words of colors in 100% inconsistency. Then there were 32 neutral words, 32 negative words and 32 positive words. There were in total six different line-ups for the Stroop task, where participant would always first see the two same slides with words of colors in 100% consistency as the first slide, then 100% inconsistency as the next slide, thereafter the negative words, after that the positive words and at last the neutral words. Next participant would take the Stroop in another order where the line-up of the last three slides would be for example neutral words, positive words and negative words.

Participants were supposed to read out loud the color of the words as fast as they could and were not supposed to read the word itself. The Stroop task was also presented on a computer

screen like the memory task on three different slides with each category of emotional state on one slide. Experimenter took the time while participants went through the Stroop task.

Results

The current study examined and compared the differences between high and low positive and negative personality traits and the outcome on cognitive performance tasks that assessed both memory and attention. ANOVA was used to analyse data for each cognitive task. Data was analyzed with 2 personality traits (low and high positive and negative) x 5 Stroop tasks (consistency, inconsistency, positive, neutral and negative), and 2 personality traits (low and high positive and negative) x 3 wordlist memory task (wordlist positive, neutral and negative) mixed ANOVAs for both positive and negative dimensions separately. The alpha criterion for significance was set at .05 one-tailed.

Scores on PANAS positive dimension ranged from 22 to 44 with a mean of = 33.1 and median of = 34.0. The scores for PANAS negative dimension ranged from 10 to 33 with a mean of = 21.7 and median of = 21.5. Participants were divided into high and low positive and negative dimensions using median split. For the positive dimension 9 participants were in the high positive group and 10 participants in the low positive group. For the negative dimension 11 participants ended up in the low negative group and 10 participants in the high negative group. Scores for the memory task were calculated as percentages of the total words on the list for each group (positive, negative and neutral).

Positive and negative personality and memory

Table 1 shows descriptive statistics for the wordlist memory task for both low and high individuals from the positive dimension on PANAS.

Table 1

Descriptive statistics for both low and high positive individuals for the wordlist memory task.

	Positive		Neutral		Negative	
	Words		Words		Words	
	Mean	SD	Mean	SD	Mean	SD
Low Positive	54.0	17.2	60.5	15.7	42.1	20.5
High Positive	60.7	18.7	58.3	13.3	39.3	24.5

Note. Performance on the wordlist memory task are presented in percentage of positive, neutral and negative words remembered.

Results of the 2 x 3 mixed ANOVA for the wordlist memory task and low and high on the positive dimension showed that there was no significant main effect of trait $F < 1$ which indicates that being either low or high positive did not matter for performance on the task. The results showed a significant main effect for the wordlist memory task $F(2, 76) = 17.770$ $p = .001$. The participants in general remembered more positive ($M=57,5$) and neutral words ($M=59,4$) compared to negative words ($M=40,6$). A post hoc comparison using Bonferoni revealed a significant difference between positive and negative words ($p=.001$) and neutral and negative words ($p=.000$). The interaction between low and high positive trait and the wordlist memory task was found to be non-significant $F(2, 76) = 1.213$, $p = .151$.

Table 2 shows descriptive statistics for the wordlist memory task for individuals high and low on negative trait.

Table 2

Descriptive statistics for both low and high negative individuals for the wordlist memory task.

	Positive		Neutral		Negative	
	Words		Words		Words	
	Mean	SD	Mean	SD	Mean	SD
Low Negative	53.8	18.6	58.1	16.4	41.3	23.3
High Negative	61.3	17.2	60.6	12.4	40.0	22.1

Note. Performance on the wordlist memory task are presented in percentage of positive, neutral and negative words remembered.

Results of the 2 x 3 mixed ANOVA for the wordlist memory task and low and high negative individuals showed that there was no significant main effect of being low or high on the negative dimension $F(1, 38) = .449, p = .26$ which indicates that being either low or high on the negative dimension did not have an impact on performance. Again the main effect for the wordlist memory task was found to be significant $F(2, 76) = 17.845, p = .01$. The interaction between low and high negative traits and wordlist memory task was not significant $F(2, 76) = .806, p = .225$. The impact of trait on performance (when measured on the negative dimension) did not vary with type of words on the memory task.

Positive and negative personality on attention

Table 3 shows descriptive statistics for the Stroop task for individuals high and low on the positive trait. Attention was measured with Stroop task which consisted of both original (consistency; word and font color matched and inconsistency; word and font color did not match) and emotional (positive, neutral and negative) Stroop task.

Table 3

Descriptive statistics for both low and high positive individuals for both the original and emotional Stroop tasks.

	Consistency		Inconsistency		Positive		Neutral		Negative	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Low Positive	14.34	2.63	27.31	5.95	22.80	5.54	23.81	5.90	22.35	3.39
High Positive	14.53	3.30	33.08	11.80	24.47	4.55	24.53	5.25	24.44	4.69

Note. Performance on the original and emotional Stroop tasks was measured in seconds.

The 2 x 5 mixed ANOVA for the low and high positive individuals showed a non-significant main effect for trait $F(1, 38) = 1.478, p = .116$ which means that being either low or high positive made no difference for task performance. A significant main effect was found for the Stroop task $F(4, 152) = 614.559, p = .001$ which indicates that the different levels of Stroop task had different effect. Follow up comparison using Bonferoni showed that Stroop consistency task was significantly faster compared to the other Stroop tasks ($p < .001$) and Stroop inconsistency task was significantly slower than the other Stroop tasks ($p < .001$). The interaction between low and high positive personality traits and Stroop task was also found to be significant $F(4, 152) = 2.038, p = .04$. As seen in Figure 1, those who were high positive were in general longer performing the Stroop tasks than those who were low positive. This was particularly true for the Stroop inconsistency task.

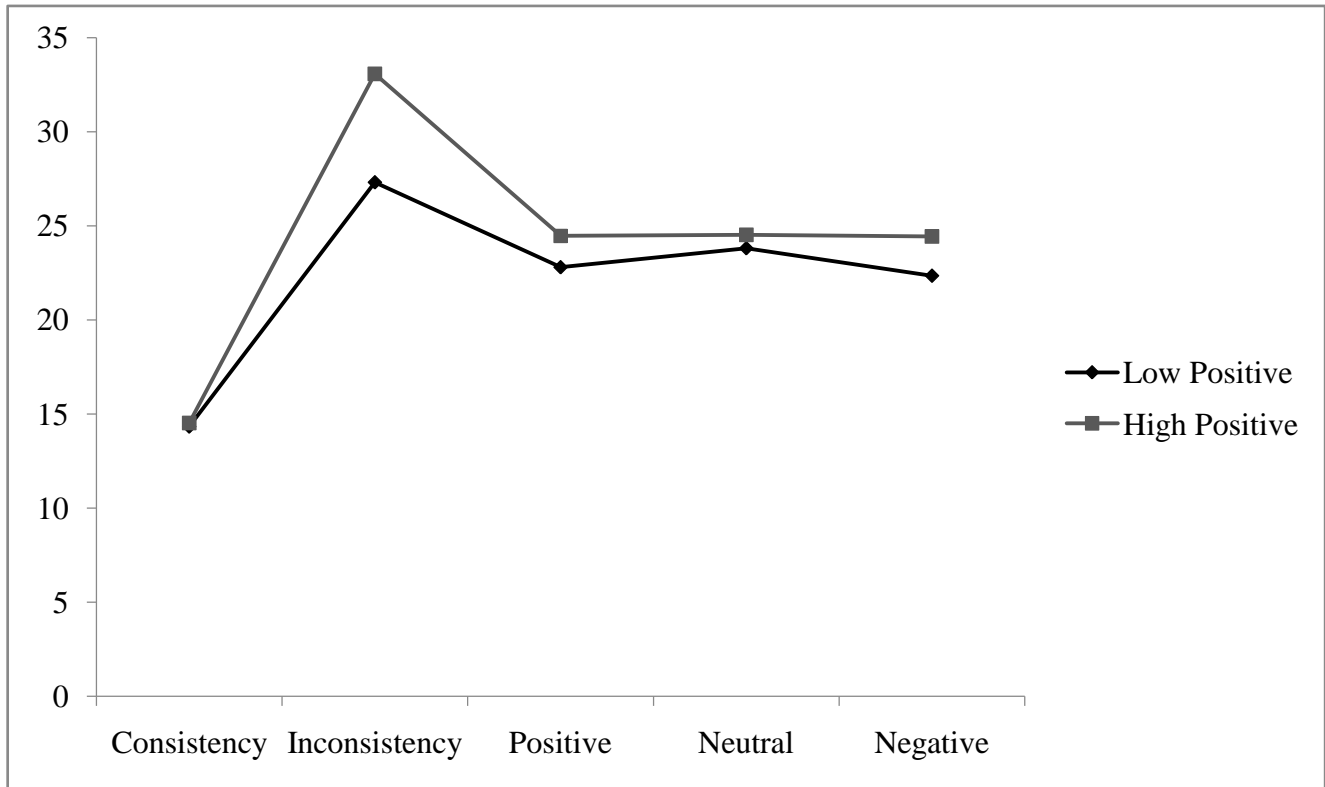


Figure 1. The interaction between low and high positive individuals and all five Stroop tasks.

Table 4 shows descriptive statistics for all five levels of the Stroop tasks for both low and high negative individuals from the PANAS questionnaire.

Table 4

Descriptive statistics for both low and high negative individuals for the Stroop tasks.

	Consistency		Inconsistency		Positive		Neutral		Negative	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Low Negative	15.18	3.38	29.88	12.52	22.42	3.82	22.82	5.33	22.40	3.70
High Negative	13.68	2.24	30.22	5.44	24.76	6.00	25.48	5.55	24.29	4.43

Note. Performance on the original and emotional Stroop tasks was measured in seconds.

The 2 x 5 mixed ANOVA for the emotional Stroop task and low and high negative individuals showed a non-significant main effect for being either low or high negative $F(1, 38) = .71, p = .21$ which means that being either low or high negative made no difference. A significant main effect was found for the Stroop task $F(4, 152) = 61.73, p = .01$ which indicates that the different levels of Stroop task had different effect. No significant main effect was found in the interaction between high or low negative individuals and type of Stroop task $F(4, 152) = 1.48, p = .11$.

Discussion

The aim of this study was to examine the interference hypothesis, or whether positive and negative personality traits affect our memory and attention. The tested claims were that those who have more negative traits (low positive or high negative) would focus on and remember more negative words and those who have more positive trait (high positive or low negative) would focus on and remember more positive words. The interference hypothesis was not supported in this study. The interaction between trait and Stroop for the positive dimension was significant, however, what the interaction revealed is that those who scored higher on the positive dimension did in general worse on all the Stroop tasks, in particular on the second Stroop task where words and colors were inconsistent. There was a main effect of Stroop and follow up comparison showed that Stroop consistency was faster than the others and no difference was found between the three emotional conditions. No main effects or interaction was significant for the memory task.

These findings show that positive mood can impair cognitive performance on Stroop task as the experiment done by Phillips et al. (2002) showed. No difference was found with high or low negative personality. Most of the previous studies showed opposite results which were that

individuals with positive personality traits rather focus on positive stimuli and negative individuals on negative stimuli (Brose et al., 2014; Caseras et al., 2007; Derryberry & Reed, 1994; Graham & Lachman, 2014; Koster et al., 2005; Li, Chan & Luo, 2010; Riediger et al., 2011; Segerstrom, 2001; Storbeck & Watson, 2014; Thomas & Hasher, 2006). Reasons for these different results that Phillips et al. (2002) concluded might be because negative individuals could be more stressed or concentrated to finish the tasks while the positive ones could not be taking the task seriously or their thoughts might be drifting away from focusing on the task. Positive individuals might have become more distracted and therefore were longer performing compared to negative individuals. Results showed that negative or positive had effect on reaction time while performing the cognitive attention task. The reasons for different outcomes from present and prior studies are considered to be because different methods, tasks and assessments produce different outcomes and conclusions.

The hypothesis of trait and attentional bias is just one possibility and previous studies have shown bias but are looking at different things like mood instead of trait or measuring trait differently (Becker & Leininger, 2011; Tamir & Robinson, 2007; Wadlinger and Isaacowitz, 2006). Limitation of the current study was that too little sample size of participants was available which produced only one significant result. No other significant interaction was found, however, difference might have been found between personality traits and cognitive performance if more participants had been involved. Another limitation could be that the personality assessments and the cognitive tasks were very different in previous studies compared to the present (Tamir and Robinson, 2007; Wadlinger and Isaacowitz, 2006). Tamir and Robinson (2007) examined positive and negative traits using self-assessment questionnaire concerning daily mood and assessed cognitive performance by using the dot probe task. Wadlinger and

Isaacowitz (2006) used questionnaires such as PANAS and LOT (life orientation test) to measure participants' personality traits and they used positive and negative pictures to assess cognitive performance. Different tasks used in the present study and previous studies have also given different outcomes. Some were examining memory using working memory tasks (Brose, Lövdén & Schmiedek, 2014; Li, Chan & Luo, 2010; Riediger, Wrzus, Schmiedek, Wagner & Lindenberger, 2011) while others were using attention tasks (Koster, De Raedt, Goeleven, Franck & Crombez, 2005; Caseras, Garner, Bradley & Mogg, 2007). Segerstrom (2001) used an emotional Stroop task like the present study but found bias from optimism towards positive stimuli.

Another possible limitation or rather should be included in future research for this subject is that maybe having ADD (attention deficit disorder) might have some influence on results on the Stroop task. Also individuals that have an eye defect of some sort could have an effect on performance on the tasks, whereas some participants in the present study informed the experimenter of having bad eyesight and that they did not even read the words on the Stroop task and that might have distorted the results. A flaw that is always present when using self-assessment questionnaires such as PANAS is the self-serving bias. PANAS is a questionnaire where the questions are sensitive and personal which measure positive and negative traits and the negative traits describe some indisposition. Individuals might have answered unintentionally or intentionally to their own benefit and made themselves look better than actually might have been the real case.

Some unexpected, interesting results were revealed when processing and evaluating the results, it was the false memory effect (Joormann, Teachman & Gotlib, 2009). Few or almost fourth of the participants had made up some negative words from the wordlist memory task that

were not on the list. Interestingly enough the nine participants that did this were individuals described with a negative personality trait. These individuals made up one or two negative words each that were not presented on the wordlist memory task. The words were similar to the words on the task and some examples are, unhappiness, dissatisfaction, insecurity, fighting, grief, sorrow, disappointment and dysphoria. According to results from the study Joormann et al. did in 2009, those who were depressed did not only perform worse on the wordlist memory task and remember fewer words than non-depressed individuals, but they also recalled falsely negative words. They discuss that the reason for those results might be because the negative words on the list brought up in participants minds related and similar words. They indicated that depressed individuals may have some deficits in cognitive functioning and therefore the false memory effect occurs. These results were very interesting and it would be worth for future research to look further at false memory effect concerning the negative traits.

In conclusion it seems to be some sort of interesting relationship between positive and negative personality traits and performance on cognitive tasks. Memory and attention is miscellaneous and many different tasks seem to be available to measure these two cognitive abilities. It would be intriguing for future studies in this field to measure PANAS compared to different kinds of cognitive assessments that measure memory and attention and see if the results varies because of different tasks used. Findings and conclusions from the present research shed a little more light on the subject and whether it is positive and negative or optimism and pessimism being measured, the material is an important issue in psychology and future studies should definitely keep on examining this material further.

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Appendix A

Eyðublað fyrir upplýst samþykki

Rannsókn: Samband persónuleikaeinkenna við hugræna frammistöðu.

Ábyrgðarmaður rannsóknar: Dr. Kamilla Rún Jóhannsdóttir, Sálfræðideild
Háskólinn í Reykjavík, sími: 599-6459

Tilgangur þessa eyðublaðs er að tryggja að þátttakandi skilji bæði tilgang rannsóknarinnar og hvert hans hlutverk er í rannsókninni. Eyðublað þetta verður að veita nægar upplýsingar svo þátttakandi geti tekið upplýsta ákvörðun um þátttöku sína í rannsókninni. Vinsamlegast leitið til rannsakandans ef einhverjar spurningar vakna eftir lestur þessa eyðublaðs.

Starfsfólk rannsóknarinnar:

Framkvæmd rannsóknarinnar og mælingar eru í höndum Söndru Blöndal (sandrabl1@ru.is), nemanda á þriðja ári í sálfræði við Háskólann í Reykjavík.

Tilgangur:

Tilgangur þessarar rannsóknar er að kanna tengsl persónuleikaeinkenna við getu einstaklinga á hugrænum verkefnum.

Verkefni:

Í þessari rannsókn svarar þú tveimur stuttum spurningalistum. Einnig verða tvö stutt hugræn verkefni lögð fyrir, annað mælir minni og hitt athygli.

Tími og staðsetning:

Þátttaka í þessari rannsókn mun taka um það bil 15 mínútur fyrir hvern þátttakanda. Rannsóknin mun fara fram í einni af kennslustofum Háskólans í Reykjavík.

Möguleg áhætta eða óþægindi:

Engin áhætta eða óþægindi felast í þátttöku þessarar rannsóknar en þér er heimilt að hætta þátttöku í rannsókninni hvenær sem er ef þú upplifir einhverja vanlíðan.

Nafnleynd/trúnaður:

Algerrar nafnleyndar og trúnaðar er gætt varðandi hlut þátttakenda í þessari rannsókn. Þær upplýsingar sem fengnar eru í þessari rannsókn verður farið með sem trúnaðarmál og aðeins notað af rannsakendum sem tengjast þessari rannsókn. Öll gögn eru merkt með þátttakandanúmeri.

Réttur til að hætta þátttöku:

Þú hefur fullan rétt á að hætta þátttöku í þessari rannsókn hvenær sem er.

Ég hef lesið ofantalda lýsingu á rannsókninni; samband persónuleika við hugræna frammistöðu. Ég geri mér grein fyrir skilyrðum þátttöku minnar.

Nafn: _____ Dagsetn.: _____

Undirskrift: _____ Vottur: _____

Appendix B

PANAS Spurningalisti

Hér fyrir neðan eru orð tengd hugsunum og tilfinningum. Vinsamlegast lestu eftirfarandi orð vandlega og merktu í þann reit sem lýsir best þinni líðan síðastliðnar TVÆR VIKUR.

Talan **1** er þegar það á aldrei við og talan **5** þegar það á alltaf við.

	1	2	3	4	5
Áhugasamur/Áhugasöm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Þjáð/ur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spennt/ur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ósátt/ur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sterk/ur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sek/ur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Óttafull/ur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Óvinveitt/ur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stórhrifin(n)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stolt/ur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Viðkvæm/ur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Árvakur/Árvök	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Skömmustuleg/ur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Innblásin(n)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Taugaóstyrk/ur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Ákveðin(n)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Athugul(l)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Taugaspennt/ur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Athafnasamur/Athafnarsöm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hrædd/ur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix C**Minnispróf – Orðalisti**Hlutlaus Orð

Ryksuga – Ísskápur – Bakki – Majónes – Ferna – Pappírsörk – Skápur – Hilla

Jákvætt Tilfinningahlaðin OrðNeikvætt Tilfinningahlaðin Orð

Brosa – Ánægja – Gleði – Hamingja

Gráta – Vonleysi – Reiði – Ósætti

Orðum raðað upp tilviljanakennt

Ísskápur

Reiði

Bakki

Vonleysi

Gleði

Ferna

Hamingja

Gráta

Hilla

Ósætti

Skápur

Ánægja

Majónes

Ryksuga

Brosa

Pappírsörk

Appendix D

Athyglispróf – Stroop

Stroop Próf

- Prófið er notað til að mæla athygli.
- Á prófinu birtast 32 orð í 5 mismunandi litum.
- Þátttakandi á að lesa upp litinn á orðinu en ekki orðið sjálf.
- Dæmi 1: **Gulur** – **Grænn** – Svartur – **Blár** – **Rauður**
- Dæmi 2: **Gulur** – **Grænn** – Svartur – **Blár** – **Rauður**
- Dæmi 3: **Bolti** – **Hamar** – **Fiskur** – **Kanna** – Skæri

Rauður **Blár** **Gulur** **Rauður** **Grænn**
 Svartur **Grænn** **Rauður** **Blár** Svartur
Blár Svartur **Rauður** **Grænn** **Gulur**
Gulur **Rauður** **Blár** **Grænn** Svartur **Blár**
Grænn **Gulur** Svartur **Gulur** **Grænn**
Blár **Grænn** **Rauður** **Gulur** **Blár** Svartur

Rauður Blár Gulur Rauður Grænn
 Svartur Grænn Rauður Blár Svartur
 Blár Svartur Rauður Grænn Gulur
 Gulur Rauður Blár Grænn Svartur Blár
 Grænn Gulur Svartur Gulur Grænn
 Blár Grænn Rauður Gulur Blár Svartur

Meiða Hatur Ótti Sjúkdómur Brjóta Gráta
 Sorg Eyðileggja Frekja Vondur Fúll Sársauki
 Vanmáttur Lygari Stríð Berja Einelti
 Veikindi Þræll Atast Rán Skemma
 Glæpur Reiði Hryðjuverk Lamast Vonleysi
 Krabbamein Árás Græðgi Spilling Vopn

Arinn Gaffall Bókahilla Húspak Sykur
 Smekkur Hestvagn Blað Tunna Mjólk
 Hveiti Svampur Takki Ísskápur Leikfang
 Klær Hundur Ostur Sími Flísar Ör
 Flugvél Verkfæri Sófi Flísar Járnsmiður
 Leira Kaffivél Ugla Yrkja Kanna Epli

Ást Gleði Hamingja Orka Fyndinn Bjartur
 Ánægja Sól Hlægja Vinur Brúðkaup
 Skemmtun Frábært Heppinn Brosa Æðislegt
 Traust Öryggi Von Frelsi Örlæti Umhyggja
 Fallegur Unaður Faðma Kærleikur Vilji
 Blíður Heilbrigður Sætur Elskaður Fallegur

Appendix E

A summary report for research participants from the Research Participant Pool of the psychology undergraduate program of Reykjavik University.

This is the credit of participants that participated in the current study:

Arnþrúður Dís Guðmundsdóttir

Baldur Kjelsvik

Bergsveinn Ólafsson

Bergþóra Kristín Ingvarsdóttir

Bessí Þóra Jónsdóttir

Dagmar Ólafsdóttir

Dagný Hermannsdóttir

Gabriela Líf Sigurðardóttir

Hildur Ýr Hilmarsdóttir

Kristey Lilja Valgeirsdóttir

Sheni Nicole Brut Navarro

Sonja Björg Jóhannsdóttir

Þóra Kolbrún Þórarinsdóttir

Þórunn Jóhannesdóttir