Relationship Patterns between Self-esteem, Self-respect and Cognitive Effort as Measured by Story Recall and the Eye Tracker

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Relationship Patterns between Self-esteem, Self-respect and Cognitive Effort as Measured by Story Recall and the Eye Tracker

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Declaration

This work is original and has not been submitted in relation to any other degree or qualification.

Signed:

Date:

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Research Module Meeting Log

STUDENT NAME: Hedvig M. Kelecsenyi

SUPERVISOR: Dr Claudine Clucas

Date	Topics discussed and actions taken
17 January 2018	Aims of the umbrella study, results of pilot study, sub-projects and study design
14 February 2018	Recruitment options, met the other students on the team, ethics application
21 February 2018	Received feedback on draft of ethics application
14 March 2018	Meeting with technicians, training on the eye tracker
21 March 2018	Training on Biopac, practising scoring recall task, recruitment strategy, RPS
11 April 2018	Results of pilot study for current research, how to use the NART
25 April 2018	Gave feedback on first experiments, received tips for further recruitment
23 May 2018	Gave update on the progress of research, received help with technical difficulties
15 June 2018	How to record the data on SPSS, model of analysis, deadline for draft
18 July 2018	Looked at first results from the questionnaires, addressed issues with exporting data from the eye tracker
23 August 2018	Looked at results from the analyses, shared our views on the outcome
6 September 2018	Received feedback on draft, met to discuss my questions
From January 2018	We have also been in regular contact by e-mail and by phone

SIGNED BY

STUDENT _____ DATE: _____

SUPERVISOR _____ DATE: _____

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1. **Abstract**

High levels of self-esteem has been associated with success for decades, while at the same time its utility to predict achievement-related behaviours has been questioned. This controversy brought self-respect (an independent, theoretically grounded construct) defined as a person's positive, affective self-regard for being a moral, principled, and honourable person, to the forefront of empirical research. Accordingly, the current study intended to examine the relationship between self-report measures of self-respect, self-esteem and cognitive effort as measured by story recall and eye tracker measures of eye fixation with pupil dilation while reading a morally neutral and a morally charged story. A total of 40 participants, comprising of 11 males and 29 females, with a mean age of 34, from a convenience sample completed the study. A stronger positive relationship was expected between self-respect and measures of cognitive effort than between self-esteem and the same measures. Also, there was an anticipation of a stronger interaction between self-respect and the type of story tested, because higher self-respect might have implications for the processing of moral information. Four repeated measures of ANCOVA analyses demonstrated significant negative relationship between self-respect and cognitive effort. They also revealed a strong trend towards a negative relationship between self-esteem and cognitive effort. The results quite interestingly are contrary to the declared hypotheses of the study with regards to the direction of the relationship. Findings indicate that the interaction between self-respect and story type on recall and eye tracker measures were not significant. Hence, failing to support the theory that high levels of self-respect enhances sensitivity to moral information through the link to the moral self. The outcome also highlights the possibility that certain factors undermine the effort or more meaningful engagement is needed, perhaps, through a more complex task. It would help to establish not only relationship patterns, but determine whether self-respect is unique enough as an independent construct that could add to the prediction of cognitive effort above and beyond what is explained by self-esteem.

2. Introduction

2.1 Self-esteem

Self-esteem, just like optimism and life satisfaction is believed to be genetically determined as well as shaped by the individual's life experiences (Caprara et al., 2009). It is an integral part of one's self-concept, therefore, it can be adequately used to characterise individual differences, which has been attracting researchers' attention for decades. Regardless of the extensive scholarly work that has gone into this domain, clearly distinguishing it from other constructs of the self has proved to be difficult (Rosenberg, Schooler, Schoenbach, & Rosenberg, 1995). By looking at the meaning of the 14c French word estime, which is "account, value, worth" (www.merriam-webster.com), the definition of global self-worth/esteem seems straightforward. But as views differ on what human qualities can qualify for self-appraisal and how they might weigh in the global trait or whether we are looking at behaviours and thoughts in particular situations or across all situations, etc., so does the definition of self-esteem. Rosenberg (1965) believed it was the individual's own judgement of their qualities and competencies. Its level indicates the extent to which people think they are capable, significant, successful and worthy (Coopersmith, 1967). Later some theorists also emphasised the importance of how people appraised themselves based on their perceived assessment by others, most importantly by significant others in their self-esteem (Burnett & McCrindle, 1999). Here, the norms and values of the society and smaller community in which people live become increasingly important (Luhtanen & Crocker, 1992). Self-esteem manifests in an attitude and according to Korman (1970), high self-esteem individuals are satisfied with their achievements, therefore they show greater confidence, than those with low self-esteem (as cited in Dipboye, 1977). For a long time high self-esteem was identified with confident and efficacious behaviour due to the individual's belief in his or her capability of successfully performing a particular task (Bandura, 1999) or attaining a certain goal (Life, 2015).

Heatherton & Polivy (1991) and many others, however, took a different perspective. They defined self-esteem more as an affective self-regard, an emotional response people get after taking stock of their experiences, as opposed to a cognitive self-evaluation of their personal and social

standing (as cited in Brown & Marshall, 2002). It is a general feeling of self-acceptance, goodness, and worthiness (Baumeister, 1998) They believed, therefore, that global self-esteem should clearly be distinguished from self-confidence and many other cognitively based facets of self-concept that might have been associated with it and looked at purely as an emotional response to self-evaluation (Brown & Marshall, 2006).

Their proposition highlights another important issue with regard to the conceptualization and inevitably the measuring of self-esteem. Could it be considered a unitary, one-domain, global trait or is it perhaps a multidimensional trait with several independent and interdependent subcomponents within it? Tafarodi and Swann, 1995 considered self-esteem a two-dimensional trait, with a self-liking and a self-competence, equally significant, but differently functioning aspects. Self-liking indicates how positively people feel about themselves, whereas self-competence shows whether they evaluate their ability to work towards the achievement of goals in a positive manner. In this way, self-competence is closely related to the concept of self-efficacy. Wojciszkei, Baryla & Parzuchowski (2011) proposed that self-liking might be considered the communal aspect of self-worth, whereas self-competence represents the agentic aspect, which is our performance oriented side.

There is empirical evidence showing that our emotionally based self-evaluation is susceptible to valenced events resulting in what is termed in the literature as state self-esteem. However, this temporary self-assessment is not believed to affect how people generally feel about themselves (Brown & Marshall, 2006), therefore global self-esteem is considered relatively stable throughout one's life. What may affect global self-esteem more permanently is the change in the level of importance of its components. To make this idea clearer, it is necessary to give further detail on some of the existing theories regarding the dimensionality or hierarchical structure of self-esteem. Heatherton and Wyland (2003), for instance, argued that self-esteem consists of three core components with several subcomponents within each, namely performance self-esteem, social self-esteem and physical self-esteem. Each component could be, and most probably is, evaluated from a cognitive and from an affective perspective and they all weigh in our feeling of global self-esteem according to their importance to our self-concept. William James (1892) posited that those things that

matter to people, to the extent they matter, are able to give them high self-esteem (as cited in Wozniak, 1999). A complete industry is built on the idea that by changing the centrality of certain components of our self-concept, global self-esteem could be increased for the benefit of the individual and the community as their general well-being and achievement will increase. But how real is that high self-esteem? Baumeister, Campbell, Krueger, & Vohs (2003) called the attention to the dangers of giving too much importance to global self-esteem in educational and work settings. For example, as they pointed out, the school bully who hides his or her inferiority complex with targeting other children, could score high on any current scale with their inflated self-esteem. The same is applicable to a person with inflated self-esteem, where the ratio between his or her aspirations and their real achievements are not assessed objectively. Similar fake result could emerge if the standards are reduced to make it easier to succeed.

2.2 Motivation and cognitive effort

Perhaps the second most important effect of self-esteem, after giving us positive feelings about ourselves is the knock on effect: motivation. Literally all theories of human motivation pay some attention to the basic need for positive self-feelings (Deci & Ryan, 1985). Global self-esteem, has long been advocated as a great motivator and several studies have provided evidence that motivation can directly impact performance (Greene & Miller, 1996; Greene, DeBacker, Ravindran & Krows, 1999). However, many studies, on the other hand, failed to show the same. It appears that the motivational effects of self-esteem need to be further explored. They have been found to relate to self-regulatory mechanisms, one of which is explained in Korman's self-consistency theory. He proposed that people have an attitude towards or motivated to perform on a task according to their self-image. To expand on this, people who have positive images of themselves will behave in a way that reinforces that positive self-image. In contrast, people who have negative images of themselves will act in a manner that is consistent with the negative image. It could manifest in withholding effort in certain situations (Dipboye, 1977).

It is argued that an alternative self-regulatory mechanism exits which is based on the self-enhancement theory and it is advanced by many, including Bedny & Karwowski, 2006 and Maehr

&Pintrich, 1991. They suggest that both low and high self-esteem individuals have basic needs to enhance their level of self-esteem. It may mean that low self-esteem individuals withhold task related effort, because they do not have confidence in their ability to succeed. So instead of consistently maintaining the feeling of inadequacy, they resort to damage control and withhold effort. They can use this lack of effort to justify poor performance, instead of facing up to problems such as lack of ability (Campbell, 1990).

It is suggested that the behavioural or physiological consequences of motivation are mediated by cognitive effort (Westbrook & Braver, 2015). Cognitive effort can be perhaps best defined as individuals' decision whether to engage and the intensity of the engagement, with several determinants, such motivation, difficulty, attention and cognitive-control (Westbrook & Braver, 2015). It seems well supported by research that cognitive effort affects individual's performance in a wide array of situations and functions (Cacioppo, Feinstein & Jarvis, 1996), including financial decision making, political attitude, persistence in goal pursuit and it also appears to impact mental health as well (Westbrook & Braver, 2015) Nevertheless, in spite of its substantial influence on people's lives it is still unclear what makes them engage more in certain situations than others.

2.3 Crucial role of self-respect

Encouraged by the findings highlighting discrepancy in the relationship between self-esteem and performance, researchers came forward with the idea of extending investigation on subconstructs of self-esteem. Throughout more recent psychological literature one component of self-esteem has been the subject of growing interest: Our worthiness of honour for living by principles and adhering to moral standards (Roland & Foxx, 2003). This concept is represented in trait self-respect, defined by Kumashiro, Finkel, & Rusbult (2002) as a sense of worth relating to one's self-concept as moral, principled and honourable across situations. It implies that self-respect promotes behaviours that help attain the respect of self and others. Although this are has been underresearched, Kumashiro and colleagues have already shown by means of empirical research that self-respect is positively associated with pro-relationship behaviour. However, if their theory holds true then self-respect might be a key factor in the processes underlying motivation in general. For instance, one's level of self-

respect could predict their motivation to exert cognitive effort toward tasks that have important outcomes.

2.4 Outline of present study

It is important to expand our understanding of the field, by designing an experiment to investigate whether the self-respect has a stronger relationship with cognitive effort than the global self-esteem construct, because of the belief that the role of global self-esteem in cognitive engagement needs to be researched further. The independent variables: global self-esteem and self-respect will be measured by self-report scales; the dependent variable: cognitive effort can be measured by gauging the level of engagement with a recall task. Participants will be given a morally-neutral and a morally-charged story to read and their attention, indicative of their cognitive effort will be measured through free recall and by taking eye tracking measures of location and duration of eye fixation including pupil dilation while they are reading. Self-respect could be associated with greater cognitive effort than self-esteem but at the same time due to its connection to the moral self it will be associated with increased sensitivity to moral information as well (Jennings, Mitchell and Hannah, 2015); hence the two types of stories. This focused attention to moral words can be an additional measure of cognitive effort (Kahneman, 1973).

It's a known fact that cognitive effort can be affected by various factors including one's reading ability. Therefore, plans are on ground to administer a widely used and reliable reading ability test to be able to control this confounding variable. It is also argued that ethnicity could influence the outcome of self-esteem measures (Crocker &Major, 1989; Cai, Deng, & Oakes, 2006), which might be the case with religion too. Ward & King (2018) argue that religious people have strong moral self-image. On that account, mean scores for these variables will be tested. Furthermore, information on recall strategy will be collected from participants after the experiment to see if any patterns emerge in that data.

Based on these research aims, which rest upon the previously described theoretical foundation, we formed the following hypotheses:

1. There will be a significant positive relationship between self-respect and eye fixation, over and above that of self-esteem and eye fixation.

2. There will be a significant positive relationship between self-respect and pupil dilation, over and above that of self-esteem and pupil dilation.

3. There will be a significant positive relationship between self-respect and recall, over and above that of self-esteem and recall.

4. There will be a stronger relationship between self-respect and cognitive engagement when reading moral content, than in the case of non-moral content.

They will be tested by four separate ANCOVA analyses.

3. Method

3.1. Sample

The population of this study encompassed 40 volunteers from Chester University and from Ellesmere Port. Convenience sampling was employed in selecting the study respondents, who were recruited from groups of undergraduate students from all year groups and from postgraduate and doctoral psychology cohorts via the university's research participation system (RPS), by distributing flyers, posters and in person. One quarter of the participants were recruited from among friends and family off campus by the researcher personally introducing the study to them. The following exclusion critera applied to participating in the research: visual impairment and heart rate. There were 11 male and 29 female participants in the sample, between the ages of 18 and 65 years (M = 34.03, SD = 12.93). The ethnic make-up of the sample: 3 Black (7.5%); 2 Asian (2.5%) and 35 White (87.5%) participants, was consistent with that of the general population of the UK, which has approximately 12% from minority groups, based on the 2011 census. 14 people declared themselves Non-religious (35%); 19 Christian (47.5%); 2 Buddhist (5%); 1 other (2.5%); 3 prefered not to say (7.5%) and one

did not answer (2.5%). According to the Office for National Satistics, Christians were the largest religious population (59.3%) in the UK in 2011. There has been a significant decrease in their proportion in favour of those reporting to have no religion (25% in 2011) since 2001. In spite of this trend, the CCA 10% difference in the number of Christians and non-religious people between our sample and the national statistics could be due to the fact that people reporting no religion generally have a young age profile, just like our sample (www.ons.gov.uk).

The research complied with the ethical code of conduct of the British Psychological Society and gained ethical approval by the Ethics Committee of the Department of Psychology at the University of Chester.

3.2. Materials

The following assessment tools were used in the present study: *Two questionnaires*; both using a Likert-type agreement scale, which participants answered in a prescribed order. First, self-respect was measured with the Self-respect Scale (SRS), (Clucas & Wilkinson, 2017). Each item was answered using a seven-point Likert scale (1= strongly disagree; 8 =strongly agree) and, after reversing the scoring for the negatively worded items, for the purpose of the present study, we excluded items from the scale for which the Corrected Item-Total Correlation value did not reach the .3, therefore, the total self-respect score was formed by summing across the remaining 9 items. The developers reported good internal consistency for SRS, Cronbach's alpha being above .8. In previous research the scale also showed convergent and discriminant validity and significant correlation with global self-esteem (Clucas & Wilkinson, 2017). For the current study, the Cronbach alpha coefficient was .83, the minimum possible score on the scale was 9 and the maximum was 63. Moreover, to assess global self-esteem participants completed the Rosenberg Self-Esteem Scale (RSE), (Rosenberg, 1965). This scale is a well-validated and widely used measure of global self-esteem, comprising of 10 items. The RSE scale presented high ratings in reliability areas; internal consistency was reported by the developer above 0.77. In the present research, participants answered each of the 10 items using a four-point Likert scale (0 =strongly disagree; 4=strongly agree). After reversing the scoring for the negatively worded items, a total self-esteem score was found by summing only responses to 9 items,

excluding the self-respect item to reduce overlap with the self-respect measure. The minimum possible score was 9, the maximum possible score was 36 and the Cronbach alpha coefficient was 0.92.

Story recall test: It was originally based upon the methods used by Isaac and Mayes (1999), although they used free recall as a means to test accelerated forgetting. Adopting the idea, the same type of free recall test was used as a measure of cognitive effort and people's relationship to moral content. The two stories, the morally charged and the morally neutral, were developed by the two senior researchers on this project. They were easily understandable and matched for reading difficulty (see Table 1)

Table 1 *Matching of the stories*

Moral Story	**Neutral Story**
Word count: 287	**Word count: 287**
Characters: 1291	**Characters: 1359**
Paragraphs: 2	**Paragraphs: 2**
Sentences: 10	**Sentences: 10**
Averages: Sentences per paragraph: 5.0	**Averages: Sentences per paragraph: 5.0**
Words per sentence: 28.7	**Words per sentence: 28.7**
Characters per word: 4.4	**Characters per word: 4.6**
Readability	**Readability**
Passive Sentences: 10%	**Passive Sentences: 10%**
Flesch Reading Scale: 58.6	**Flesch Reading Scale: 54.7**
Flesch Kincaid Grade Level: 12.2	**Flesch Kincaid Grade Level: 12.1**

Flesch Reading Ease test is designed to rate the text on a 100-point scale. The higher the score, the easier it is to read the text. Our 54-59 point score makes the stories readability eaqual to that of the most popular daily newspapers in the UK. This score can be convereted into a (US) school grade level score that is the Flesch-Kincaid Grade Level. In order to be able to read the stories easily, the reader is required to be minimum of grade level 12, so 18 years old (www.sshs.exeter.ac.uk).

The required time to read each story was checked on an online read-o-meter and was set based on that result (http://niram.org/read/).

Story A (morally charged) described two students, Jemma and Martin, meeting up at Chester University to work on an assignment which was due in a few weeks. The moral aspects included Jemma wearing a mink fur coat, she being characterised as an honest, conscientious person and at the climax of the story, Martin cheating by looking at the her essay without obtaining her permission. The

moral content took up exactly half of the story and it appeared broken up into three separate parts within the text. Story B (morally neutral) also had a female and a male main character who planned to meet up for a romantic meal after their sports training, but an accident and an illness prevented it. (See appendix for the stories.)

The texts were saved on separate pdf files and projected onto the wall of the lab, with the lights switched off. The recall marking sheets contained the entire text broken down into words or expressions. Any correctly recalled item, with minor variations for grammar, were ticked off on the sheet. The minimum possible score was 1 for each story and the maximum possible score was 79 for the morally charged story and 81 for the morally neutral story.

Eye-tracker: The stories used for the recall task were the stimuli for the eye-tracking task as well. Each stimulus was the word processed story (A or B) in a clear font (Arial), size 13.5, single spaced, in black against a white background, with minimal margin all round, landscape style with a 4:3 ratio. The dimensions of the image projected full screen was 180 x 134 cm with the resolution of SVGA 800x600; The participants distance from the stimulus was 200 cm.

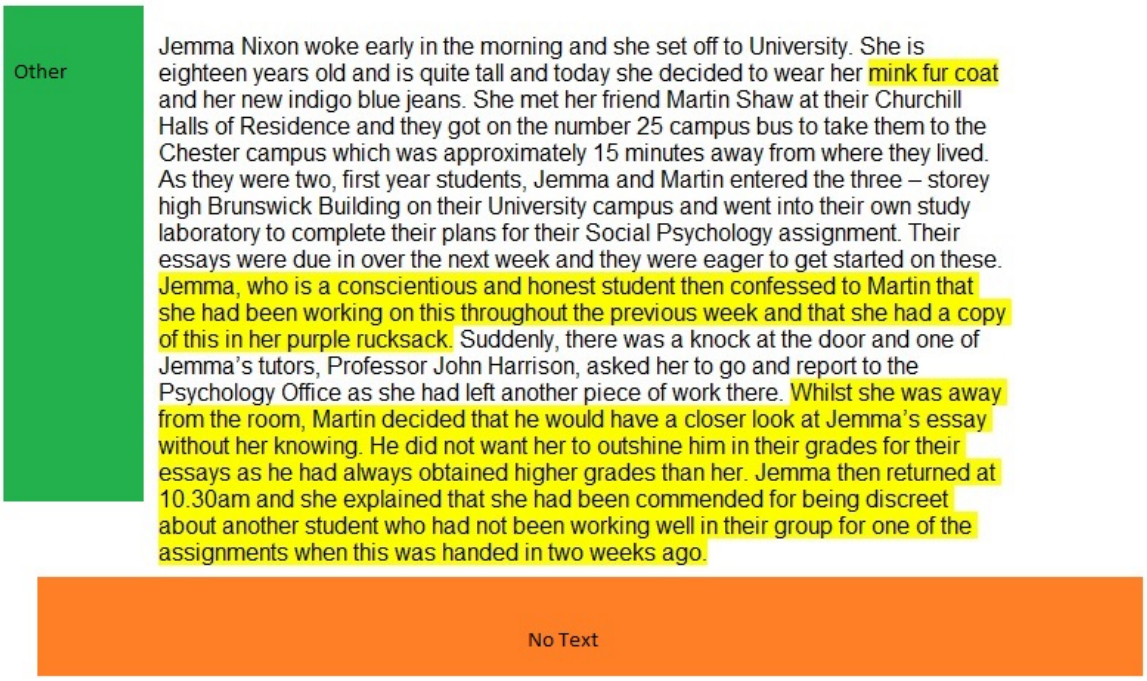
Participant data from reading was recorderd with the help of iViewETG System (version 2.0), which includes SMI Eye-tracking glass device and SMI-ETG Laptop, preloaded with all the required drivers and software, including the iView-ETG software, which controlls and records the experiment and BeGaze, the data analysis software (BeGaze Manual, 2014).

It is a non-invasive, video based eye-tracking solution. The glasses were worn by the participants, just like normal glasses, often in front of their own glasses. These are equipped with a buil-in high definition camera which, complemented by special technology, is capable of capturing the wearer's eye movements. The metrics used to measure these movements were: (a.) Fixation: the duration for which the eyes focus on one specific element of the stimulus. All fixations that did not reach the 80 ms threshold were rejected. The number of detected fixation events was also recorded. (b.) Pupil dilation: the size of the pupils at the fixation event in mm (BeGaze Manual, 2014).

The Area of Interest (AOI), in story B was the whole text and in story A the following areas (see diagram 1): Moral text: highlighted in yellow, Other text: any text not highlighted. No-text events: when the participant is fixated on something other than the text, was also recorded for both stories.

Notwithstanding, our analyses concentrated on comparing the moral vs. non-moral text regions within story A and between the two stimuli.

Figure 1: *AOIs in story A.*



While the participants were reading or just simply looking at the stimulus, their eye movements were measured at a sampling rate of 30 HZ, so 30 cycles per second. The detected events were recorded and mapped onto the video footage of the stimulus while reading for each participant, to be matched with areas of interest (AOIs) after the experiment. In this study, eye fixation and pupil dilation data for relevant events were exported with the use of the system's own image analysis algorithm. Average fixtion time was calculated by dividing the total fixation time spent on the Area of Interest (AOI) by the number of fixation events, which included the first visit and all the revisits as well. Average Pupil Dialtion was calculated by adding up the pupil dilation measures of each event per AOI and deviding it by the number of events, which included all the revisits as well (BeGaze Manual, 2014).

It is important to note that the manufacturer did not report in the users' manual the device's typical performance and there are currently no standards for what should be reported with regards to validity and reliability, although some researchers, such as Holmqvist, Nyström andMulvey (2012) call attention to the importance of reporting such information. There are many factors influencing data

quality, for example: participants with different physiologies, operator's skills to calibrate, if the participant moves or blinks a lot during the experiement, recording environment such as lighting conditions, position from stimulus and so on. It was outside the scope of this dissertation study to assess the quality of data for each participant, for exclusion criteria in the sample, and also as mentioned above, there was no normative data available for comparison. Therefore, the study relied on the most common data quality evaluation and system validation method, namely asking the participant to focus on a certain point at calibration. Moreover, it is also highlighted in the manual of the eye tracker system that the accuracy and precision of fixation data may improve if data from two eyes is combined, hence, binocular mode was used. After taking all these preliminary measures, it was assummed that the data collected were valid and reliable; knowing also that this particular system is widely used in psychology, reading research and cognitive neuroscience. However, in spite of following the procedures outlined in the guide rigorously, some data loss occurred at the recording stage of the experiment. According to Holmquist and his colleagues (2012) data losses come from periods during the experiment when track ability of some critical features in the eye image is low or lost. This can happen, for example, when people wear glasses, contact lenses, eyelashes, or simply blink too often. Fortunately, these were not common and possibly did not affect the results.

National Adult Reading Test (NART): It is a widely used, reliable and valid measuring for testing adults for reading ability. In the current study the 50-word NART scale was used. It is an open source test and with the author's permission it could be used in any studies or publications (Nelson, 1991). The test was administered by giving each participant the list of 50 words and asking them to read each word aloud. Guessing the pronounciation of an unknown word was encouraged and guesses were reinforced. Participants were allowed to change their response for each word several times if they wished, providing they clearly stated their final choice was. No time limit was imposed, so the participants could start whenever they were ready and read at their own pace to the end, attempting all the items on the list. A total incorrect answer score was calculated after the examiner indicated for each word whether it was pronounced correctly or not. Participants were not penalized for minor variations from the exact pronunciation. The minimum score on this measure was 0 (zero pronounciation errors) and the maximum was 50, if someone got them all wrong.

See appendix for subsidiary paperwork.

3.3. Procedure

After the study had received ethical approval, recruiting respondents commenced and those who agreed to take part in the study booked a date and time to participate based on several available time slots. When they arrived at the testing location, which was a testing lab at Chester University, and participants were given a brief introduction to the research. They were also asked to read the participant information sheet and to sign the consent form. After this, participants completed the study in approxiamtely 40-50 minutes, with the tasks following each other in a prescribed order. Since the order of the presentation of the tasks was counterbalanced they either started with b = questionnaire or a = the reading task, depending on the letter code randomly assigned to their unique participant number. Before the study, a sequence of 40 letters with only a-s and b-s in it was generated, with the help of a web-based program on the website of David Reed, Professor of Computer Science, Creighton University, Omaha, NE (http://www.dave-reed.com/Nifty/randSeq.html): bbaabbbbbbbbaabaabaababaaaaaaaabbaaabbba. This letter order from 1 to 40 was accurately followed when administering the test to each new participant. The counterbalancing of the reading and recall tasks was done the same way as a different sequence of 40 letters was generated (a = story A and b = story B) prior to the study: abbababaaaabaabbbbabbbbabbbbbabbabaabaaa. It meant that the first participant read and then recalled information from story A (the morally charged story), the second participant read and subsequently recalled information from story B (the morally neutral story) and so on until the fortieth letter and last participant. When it was turn for the reading task, the eye tracker glasses and the Biopac machine's electrodes were placed on the participant. (We also gained ethical approval to collect physiological data at the same time, for the purposes of the umbrella project.) For the calibration of the eye tracker we projected an image of a lotus flower onto the wall, with a clearly visible centre for the participants to focus on. It was also meant to have a calming effect. The participants looked at this image during the calibration and during the first 50 seconds of the experiment (the basline for the Biopac), when the slide automatically changed onto the text to be read. After 1 minute 15 seconds the slide with the text also disappeared. As described above, the recall tasks

were administered immediately after each reading. Any piece of information given was recorded on the marking sheets by the experimenter exactly when they were given. The NART test was always administered last and errors of pronounciation noted immediately. Throughout the experiment the participants' well-being was checked several times, and they were offered a refreshment drink if needed. In the end they were debriefed and reminded that they could talk to any of the senior researchers, their PAT, Student Support, or GP if they had any concerns. They were also given the opportunity to ask any questions about the experiment.

3.4 Design and Analysis

In this quantitative, within-subjects experimental and correlational study, we used SPSS to yield descriptive statistical data, to look for a correlation between the variables and to examine relationships between the covariates and outcome variables to test the hypotheses.The covariates were self-esteem and self-respect, whereas the outcome variables were Total item recall A, Total item recall B, Pupil dilation total moral text A, Pupil dilation total other text AB, Eye fixation total text A, Eye fixation total text B, Eye fixation total moral text A, Eye fixation total other text A; all indicators of cognitive effort. As shown in Table 2, four repeated measures ANCOVA analyses allowed the researchers to determine whether self-esteem and self-respect had a statistically significant relationship with cognitive effort or if self-respect had any differential relationship with the moral content. The alpha level was set at $p < .05$ for all statistical tests (Pallant, 2003).

Table 2 *Details of the statistical design for the four analyses*

	Two levels of the factor	Covariates
1.	Eye fixation total text A; Eye fixation total text B	Self-esteem; Self-respect
2.	Total item recall A; Total item recall B	Self-esteem; Self-respect

	Two levels of the factor	Covariates
3.	Pupil dilation total moral text A; Pupil dilation total other text AB	Self-esteem; Self-respect
4.	Eye fixation total moral text A; Eye fixation total other text A	Self-esteem; Self-respect

In order to avoid confounding variables that controlled for age, NART, gender, ethnicity, and the Task order where the strength of the relationship between these variables and the outcome indicated, the extreme outlier 38 was removed from the Eye fixation total text B data before running the analyses for this measure.

4. Results

4.1. Preliminary analyses

As the data was found clean from errors, preliminary analyses were carried out on each variable. The Means and Standard Deviations are presented in Table 3. It should be noted that the scores for self-respect, where the total score for the scale was 63, were in the top quarter, and for the self-esteem scale, with a total possible score of 36, the scores were also all well above the midpoint. This indicates that, on average, the participants in the sample had high levels of each of the aforementioned constructs. The variation in sample size is due to loss of data during eye tracker experiement and two participants were not able to complete the NART.

Table 3 *Means and standard deviations for all measures*

Variables	N	Mean	SD
RSE	40	28.73	5.03
SRS	40	50.80	6.22
Average fixation on total text A	36	155831.19	23933.87
Average fixation on total text B	35	164408.17	66263.45
Average pupil dilation moral text A	35	3.33	.97
Average pupil dilation other text AB	39	3.36	.73
Average fixation moral text total	35	157083.09	27692.26
Average fixation other text A	36	155100.97	24476.62
Item recall moral story A	40	16.40	7.08
Item recall moral story B	40	17.10	8.38
NARTerrors	38	16.79	6.16

Note. N = number of participants, *SD* = Standard Deviation; *RSE* = Rosenberg Self-esteem Scale; *SRS* = Self-respect Scale; The fixation data is in ns and the pupil dilation is in mm; The total number of items a participant could recall from text A was 81 and from text B was 79; Also, the total number of words pronounced in the NART test was 50.

The data was analysed for normality using the Kolmogoro-Smirnov test. Apart from Average fixation total text B: $K\text{-}S\ (17) = .36$, $p < .001$, there was no violation of the assumption of a normal distribution in any of the measures (See Appendix A for Histograms). We found only one extreme outlier (participant 38), also in Average fixation total text B.

T-tests. After counterbalancing the order of presentation of tasks, we know that 19 participant completed the questionnaire first (47.5%) and 21 the reading task (52.5%), giving the total of 40 participants (100.00%). Also, after counterbalancing the order of reading the morally charged (A) and the non-moral (B) story, 19 participants (47.5%) read story A first, and 21 (52.5%) read story B first, adding up to 40 participants in total (100.00%). The data relating to the order of the presentation of the tasks and the stories to read were further analysed using independent sample *t*-tests to identify whether they had any impact on the outcome scores. As shown in Table 4, the order of reading the stories had a significant, large effect (Cohen, Manion, & Morrison, 2007) on the Item recall scores in case of the

non-moral story (B). Participants who read this story first, recalled much less than those who read it second. Other than that, the reading order of the stories did not have any significant effect on the other dependent variables. It might have been that the participants found text B more difficult to read, as the plot was perhaps more complex than in text A. Therefore practice effect could have helped them recall more when they read it second.

Table 4 *Summary of t-tests for the order of reading the stories A and B*

Measure	First read	Mean	SD	df	t	p	Mean diff.	Eta sq.	95% CI LL	95% CI UL
Fixation total A	A	160533.16	25350.89	34	1.26	0.18	9957.10	0.04	-6148.57	26062.77
	B	150576.06	21782.30							
Fixation total B	A	172469.35	87349.61	33	0.69	0.492	15674.52	0.01	-30271.05	61620.09
	B	156794.83	38395.32							
Pupil dilation moral text	A	3.37	1.02	33	0.24	0.815	0.08	0.00	-0.0	0.75
	B	3.29	0.94							
Pupil dilation other text AB	A	3.32	0.81	37	-.29	0.773	-0.07	0.00	-0.55	0.41
	B	3.39	0.68							
Fixation moral text	A	164067.39	27553.00	33	1.57	0.126	14379.45	0.07	-4278.86	33037.76
	B	149687.94	26645.46							
Fixation other A	A	158619.21	26466.83	34	0.91	0.369	7450.39	0.02	-9197.23	24098.01
	B	151168.82	22166.65							
Item recall A	A	16.68	7.90	38	0.24	0,813	0.54	0.00	-4.05	5.14
	B	16.14	6.44							
Item recall B	A	21.68	6.72	38	3.82	0.000	8.73	0.28	4.10	13.36
	B	12.95	7.65							

Note. The variation in sample size is due to loss of data during eye tracker experiment; *A* = the moral story; *B* = the non-moral story; *SD* = Standard Deviation; *df* = degrees of freedom; *p* = probability; *CI* = confidence intervals; *LL* = lower limit; *UL* = upper limit; The fixation data is in ns and the pupil dilation is in mm.

As shown in Table 5, the order of the tasks did not have significant effect on any of the variables except for Average Pupil Dilation on other text AB.

Table 5 *Summary of t-tests for the order of tasks: Questionnaire and Reading*

Measure	First done	Mean	SD	df	t	p	Mean diff.	Eta sq.	95% CI LL	95% CI UL
Fixation total A	Q	162313.59	24696.99	34	1.57	0.126	12282.43	0.07	-3627.02	28191.89
	R	150031.16	22281.60							
Fixation total B	Q	178492.56	90511.96	33	1.16	0.254	25944.93	0.04	-19568.48	71458.34
	R	152547.63	33793.32							
PD moral	Q	3.63	0.97	33	1.85	0.073	0.59	0.09	-0.06	1.23
	R	3.05	0.90							
PD other AB	Q	3.61	0.58	37	2.22	0.033	0.50	0.12	0.04	0.95
	R	3.12	0.79							
Fix. T. moral	Q	161183.76	30109.37	33	0.85	0.403	7973.54	0.02	-11160.02	27107.10
	R	153210.22	25451.51							
Fix. Other A	Q	163395.12	24133.65	34	2.00	0.053	15715.22	0.11	-218.59	31649.04
	R	147679.89	22893.34							
Item recall A	Q	16.47	7.02	38	0.06	0.954	0.14	0.00	-4.46	4.74
	R	16.33	7.31							
Item recall B	Q	17.84	7.77	38	0.53	0.601	1.41	0.01	-4.01	6.84
	R	16.43	9.04							
RSE_9it	Q	3.09	0.51	38	-1.12	0.269	-0.20	0.03	-0.56	0.16
	R	3.29	0.59							
SRS_9it	Q	50.32	6.55	38	-0.44	0.663	-0.87	0.01	-4.91	3.16
	R	51.19	6.05							

Note. The variation in sample size is due to loss of data during eye tracker experiment; *A* = the moral story; *B* = the non-moral story; *Q* = Questionnaire; *R* = Reading task *SD* = Standard Deviation; *df* = degrees of freedom; *p* = probability; *CI* = confidence intervals; *LL* = lower limit; *UL* = upper limit; *RSE* = Rosenberg Self-esteem Scale; *SRS* = Self-respect Scale; *PD* = Pupil Dilation; The fixation data is in ns and the pupil dilation is in mm.

The Ethnic groups were merged into two main cathegories: Minorities and Whites for the sake of easier analysis. The effect of these variables on the dependent and independent variables were tested in an Independent Sample T-test. As shown in Table 6, Fixation on the total moral text was significantly impacted by Ethnicity.

Table 6 *Summary of T-test for Ethinic groups*

Measure	Ethnic group	Mean	SD	df	t	p	Mean diff.	Eta sq.	95% CI	
									LL	UL
Fixation total A	W	154354.21	24304.89	34	-1.24	.224	-17723.79	.04	-46834.53	11386.95
	M	172078.00	11872.27							
Fixation total B	W	151093.10	29713.56	4	-1.41	.230	-93205.50	.06	-275399.93	88988.93
	M	244298.60	147015.00							
PD moral	W	3.35	1.00	33	.37	.713	.22	.00	-.98	1.42
	M	3.13	0.59							
PD other AB	W	3.35	0.77	37	-.08	.940	-.03	.00	-.75	.69
	M	3.38	0.50							
Fix. T. moral	W	154246.78	26523.78	33	-2.07	.046	-33090.22	.12	-65570.95	-609.49
	M	187337.00	25110.99							
Fixation Other A	W	154325.82	25351.11	34	-.63	.536	-9301.85	.01	-39562.44	20958.74
	M	163627.67	9083.25							
Item recall A	W	16.97	6.72	38	1.37	.180	4.57	.05	-2.21	11.35
	M	12.40	9.04							
Item recall B	W	17.34	8.04	38	.48	.634	1.94	.01	-6.25	10.14
	M	15.40	11.50							
RSE_9it	W	3.13	0.56	38	-1.79	.081	-.47	.08	-.99	.60
	M	3.60	0.40							
SRS_9it	W	50.29	6.37	38	-1.33	.192	-3.91	.04	-9.88	2.05
	M	54.02	3.96							

Note. The variation in sample size is due to loss of data during eye tracker experiment; *A* = the moral story; *B* = the non-moral story; *W* = White; *M* = Minority *SD* = Standard Deviation; *df* = degrees of freedom; *p* = probability; *CI* = confidence intervals; *LL* = lower limit; *UL* = upper limit; *RSE* = Rosenberg Self-esteem Scale; *SRS* = Self-respect Scale; *PD* = Pupil Dilation; *it* = item; *Fix. T* = Fixation Total; The fixation data is in ns and the pupil dilation is in mm.

The effect of the two largest groups in the Religion variable: Non-religious and Christian, on the dependent and independent variables were tested by independence samples T-test. As shown in Table 7, religion had no significant effect on any of the tested variables.

Table 7 *Results of Independent Samples T-test for Religion*

Measure	Religion	Mean	SD	df	t	p	Mean diff.	Eta squared	95% CI	
									LL	UL
Fixation total A	Non-r.	150636.57	16802.66	28	-1.04	.306	-9619.30	.04	-28529.77	9291.17
	Chr.	160255.88	30711.16							
Fixation total B	Non-r.	151414.17	16388.80	26	-.75	.458	-20914.52	.02	-78020.51	36191.47
	Chr.	172328.69	94745.24							
PD moral	Non-r.	3.49	0.68	27	.58	.563	.22	.01	-.55	1.00
	Chr.	3.27	1.24							
PD other AB	Non-r.	3.53	.71	30	.80	.428	.21	.02	-.32	.73
	Chr.	3.32	.73							
Fix. T. moral	Non-r.	151495.57	20126.92	22	-.97	.342	-10451.76	.03	-32777.73	11874.21
	Chr.	161947.33	36142.20							
Fixation Other A	Non-r.	150070.93	17909.28	28	-.98	.336	-9271.70	.03	-28674.25	10130.85
	Chr.	159342.63	31185.07							
Item recall A	Non-r.	18.00	4.40	27	.99	.329	2.32	.03	-2.46	7.10
	Chr.	15.68	8.78							
Item recall B	Non-r.	18.86	8.27	31	.66	.512	2.07	.01	-4.29	8.42
	Chr.	16.79	9.24							
RSE_9it	Non-r.	3.08	0.61	31	-1.56	.129	-.28	.07	-.65	.09
	Chr.	3.36	0.44							
SRS_9it	Non-r.	50.50	5.22	31	-.50	.624	-1.13	.01	-5.79	3.52
	Chr.	51.63	7.26							

Note. The variation in sample size is due to loss of data during eye tracker experiment; *A* = the moral story; *B* = the non-moral story; *Non-r.* = Non-religious; *Chr*. = Christian *SD* = Standard Deviation; *df* = degrees of freedom; *p* = probability; *CI* = confidence intervals; *LL* = lower limit; *UL* = upper limit; *RSE* = Rosenberg Self-esteem Scale; *SRS* = Self-respect Scale; *PD* = Pupil Dilation; *it* = item; *Fix. T* = Fixation Total; The fixation data is in ns and the pupil dilation is in mm.

The effect of Gender on the dependent and independent variables were tested by independence samples T-test. As shown in Table 8, Fixation on total moral text was significantly affected by Gender.

Table 8 *Independent Samples T-test results for Gender*

Measure	Gender	Mean	SD	df	t	p	Mean diff.	Eta sq.	95% CI	
									LL	UL
Fixation total A	M	147351.40	20299.50	34	-1.43	.162	-12210.96	.06	-29551.70	5129.78
	F	159562.30	24823.83							
Fixation total B	M	150423.20	33695.64	33	-.84	.406	-20394.78	.02	-69693.69	28904.14
	F	170818.00	76555.55							
PD moral	M	3.69	1.39	12	1.18	.260	.52	.04	-.44	1.48
	F	3.17	0.68							
PD other AB	M	3.48	1.14	11	.49	.635	.17	.01	-.61	.96
	F	3.31	0.51							
Fix. T. moral	M	143528.00	23959.73	33	-2.05	.048	-19767.83	.11	-39378.14	-157.53
	F	163295.80	27493.16							
Fixation Other A	M	149054.30	22076.93	34	-.98	.333	-8707.25	.03	-26713.56	9299.07
	F	157761.50	25426.05							
Item recall A	M	15.09	5.92	38	-.72	.479	-1.806	.01	-6.91	3.30
	F	16.90	7.51							
Item recall B	M	17.45	6.65	38	.16	.872	.49	.00	-5.60	6.58
	F	16.97	9.06							
RSE_9it	M	3.42	0.52	38	1.66	.106	.32	.07	-.71	.71
	F	3.10	0.56							
SRS_9it	M	52.46	6.19	38	1.05	.299	2.32	.03	-2.14	6.77
	F	50.14	6.23							

Note. The variation in sample size is due to loss of data during eye tracker experiment; *A* = the moral story; *B* = the non-moral story; *M* = Male; *F* = Female, *SD* = Standard Deviation; *df* = degrees of freedom; *p* = probability; *CI* = confidence intervals; *LL* = lower limit; *UL* = upper limit; *RSE* = Rosenberg Self-esteem Scale; *SRS* = Self-respect Scale; *PD* = Pupil Dilation; *it* = item; *Fix. T* = Fixation Total;The fixation data is in ns and the pupil dilation is in mm.

Correlation test between NART, Age and the dependent and independent variables.

According to Cohen's interpretation regarding the size of the value of the correlation coefficient, there was large positive correlation between NART errors and three out of four eye fixation outputs, which is theoretically consistent: Average fixation on total text A, r (32) = .51, p = .002, Average fixation on moral text total, r (31) = .51, p= .002, Average fixation other text A, r(32) = .44, p = .009. The pattern of correlations between Age and Average fixation on total text A, r(34) = -.39, p = .017, Average pupil dilation other text AB, r(37) = -.32, p = .046, Average fixation other text A, r(34) = -.39, p = .020 was

significant, medium, negative correlation. Between the variables -Age and Global Self-esteem- there was strong, positive correlation, r (38) = .40, p = .011.

4.2. Main analyses

Correlation test between the dependent and independent variables. As the preliminary analysis indicated non-normal distribution for Average fixation on total text B variable, a decision was taken to remove the extreme outlier (38) and run the normality test again. This time the results showed normal distribution for this variable too. The relationship between cognitive effort (as measured by eye fixation, pupil dilation and recall task through reading a morally charged and a non-moral story) and global self-esteem and self-respect (as measured by Rosenberg Self-esteem Scale and the Self-Respect Scale, respectively) was investigeted by using the Pearson's product-moment correlation coefficient (See Table 9 for correlations.).

Contrary to our expectations, no significant correlations were found between global self-esteem and any of the cognitive effort measures. It was not the case for self-respect though, as it showed significant correlation with Average fixation on total text B, however, not in the predicted positive direction. Interestingly, the relationship between all other cognitive effort mesures and self-respect pointed toward the same trend of negative correlation. Had we had a larger sample, these correlations might have been significant too. Self-esteem and self-respect measures showed significant, positive correaltion, but it did not violate the covariate correlation assumption as the correlation was not over r = .80.

Table 9 *Pearson's Product-moment correlations (r) between self-esteem, self-respect and cognitive effort measures*

	Variables	1	2	3	4	5	6	7	8	9	10
1	Average fixation on total text A	-									
2	Average fixation on total text B	.58**	-								
3	Average pupil dilation moral text A	.27	.06	-							
4	Average pupil dilation other text AB	.15	-.01	.83**	-						
5	Average fixation on moral text total	.90**	.65**	.21	.07	-					
6	Average fixation on other text A	.96**	.75**	.31	.17	.75**	-				
7	Item recall moral story A	.05	-.06	.14	.09	-.14	.22	-			
8	Item recall moral story B	.15	-.03	.07	-.03	.07	.19	.53**	-		
9	RSE	-.15	-.21	-.14	-.17	-.17	-.15	-.12	.01	-	
10	SRS	-.17	-.35	-.20	-.12	-.28	-.14	-.28	-.20	.71**	-

Note. *$p < .05$. **$p < .01$ (2-tailed); *RSE* = Rosenberg Self-esteem Scale; *SRS* = Self-respect Scale; *NART* = National Adult Reading Test;

ANCOVA. As all the assumtions were met, two repeated measures in ANCOVA analysis were conducted to assess the relationship between self-respect, global self-esteem, and story type (A: moral vs. B: non-moral) on eye fixation and item recall measures:

1. Average fixation for the total (whole) text A and Average fixation for total text B were the dependent variables. After controlling for Age and NART and removing outlier 38, none of the main effects were statistically significant;

the effect of story type: F (1, 25) = 1.73 , p = .200, partial eta squared = .07; the interaction between self-respect and the story type: F (1, 25) = .83, p = .372, partial eta squared = .03; the interaction between global self-esteem and the story type: F (1, 25) = .68, p = .419, partial eta squared = .03; apart from a trend for a relationship between global self-esteem and eye fixation over the two stories: F (1, 25) = 2.98, p = .096, partial eta squared = .11 and a significant relationship between self-respect and eye fixation over the two stories: F (1, 25) = 5.40, p = .029, partial eta squared = .18. However, we can see from the correlation results that these relationships are not positive, as expected, but inverse.

2. Total Item Recall Story A and Total Item Recall Story B were the dependent variables. None of the main effects were statistically significant; the effect of story type: F (1, 37) = .13, p = .724, partial eta squared = .003; the interaction between self-respect and the story type: F (1, 37) = .01, p = .919, partial eta squared = .000; the interaction between global self-esteem and the story type: F (1, 37) = .32, p = .576, partial eta squared = .009. The relationship between self-respect and recall over the two stories: F (1, 37) = 4.16, p = .049, partial eta squared = .10 was significant and negative on this measure, although after controlling for Reading Order this result changed to non-significant, strong trend in the negative direction: F (1, 36) = 3.01, p = 0.091, partial eta squared = 0.08. The relationship between global self-esteem and recall over the two stories: F (1, 37) = 1.54, p = .223, partial eta squared = .04 was not significant.

Subsidiary analysis: An additional two ANCOVA analysis were run to further explore the participants' sensitivity to moral information by testing the relationship between global self-esteem, self-respect, and the text type (the moral parts from story A vs. other- non-moral parts from the same story and also from B) as well as eye fixation and pupil dilation measures:

3. Average Eye fixation for all moral texts from story A and Average eye fixation for other, non-moral texts from story A were the dependent variables. After controlling for Age, NART, Gender and Ethnicity, none of the main effects were statistically significant, the effect of text type: F (1, 26) = .67, p = .551, partial eta squared = .01; the interaction between self-respect

and the type of text: F (1,26) = .37, p = .55, partial eta squared = .14; the interaction between global self-esteem and the type of text: F (1, 26) = .30, p = .587, partial eta squared = .12. The relationship between self-respect and eye fixation over the two types of texts: F (1, 26) = .58, p = .453, partial eta squared = .02 and between global self-esteem and eye fixation over the two types of texts: F (1, 26) = .06, p = .816, partial eta squared = .002 was not significant either. Nevertheless, some trend for a negative relationship is noticeable between global self-esteem and eye fixation.

4. Average Pupil Dilation for all moral texts from story A and Average Pupil Dilation for other, non-moral texts from story AB were the dependent variables. After controlling for Age, none of the main effects were statistically significant; the effect of text type: F (1, 30) = .12, p = .729, partial eta squared = .004; the interaction between self-respect and the type of text: F (1, 30) = .362, p = .552, partial eta squared = .01; the interaction between global self-esteem and the type of text: F (1, 30) = .90, p = .350, partial eta squared = .02. The relationship between self-respect and pupil dilation over the two types of texts: F (1, 30) = .856, p = .362, partial eta squared = .03 and between global self-esteem and pupil dilation over the two types of texts: F (1, 30) = .18, p = .673, partial eta squared = .006 was not significant either.

As the interactions were not significant no further testing was conducted (Conrad &Serlin, 2005).

5. Discussion

5.1 Findings

The objective of this study was to expand our understanding on what motivates people to engage more and expend greater cognitive efforts in order to succeed in tasks with important outcomes, by exploring the possible relationship between global self-esteem, self -respect and cognitive effort. In line with current literature, the hypothesis propose that there would be significant positive relationship between self-respect and two eye tracker measures of cognitive effort (eye

fixation and pupil dilation) and recall, over and above that of self-esteem and the same measures. A stronger relationship between self-respect, which reflects our self-worth as a principled and honourable person, and cognitive engagement was expected when reading moral content, than in case of non-moral content, due to the link to the moral self.

Possible explanations for variable interaction results. Our prediction for the interaction between self-respect and measures of engagement with moral information did not hold true, therefore our hypotheses need to be rejected. This outcome suggests that, although there might be a link to the moral self it does not necessarily mean greater sensitivity to moral content. Based on the self referent paradigm, the self-relevant moral content should have activated a more elaborative processing of that particular text, but it clearly did not (Klein & Loftus, 1988). It's possible the reasons lies on the fact that the actual moral content was not descriptive of the readers or it didn't pose a moral dilemma to the reader (Kristjánsson, 2007). Hence, instead of a deeper, elaborative processing, they simply encoded the moral words semantically. Also, many participants reported after the experiment that they could not read the last one or two lines of the stories in the allocated time, which means that they missed an important part of the moral content in story A. It would have made a difference to the recall results surely, if they had read the full story, but it possibly would have affected the eye tracker measures too. According to the read-o-meter test the 1-minute 15-second time should have been enough for reading the story. The fact that the participants could not finish is indicative of the difficulty of the task. Wearing the eye tracker glasses, being wired up to the Biopac machine and reading from a screen instead of a sheet of paper may have made it too difficult to link the moral information to trait-descriptive, let alone autobiographical information in their memory (Klein, Loftus, Burton, 1989) Klein and his colleagues (1989) also demonstrated that those words that not only require the participants to decide whether they describe them or not, but personal memory associated with the words needs to be retrieved, have greater effect on recall.

It is also possible that apart from semantic encoding, mainly organisational processing characterised the execution of the recall task. When participants were asked about their recall strategy after they finished the experiment, most of them talked about having a strategy to link important facts

and events in the story to each other.They generally memorise the plot as sequence of events instead of focusing on specific phrases or words. However, it should have resulted in superior recall performance, because organizational processing of information proved to be more successful than either elaborative or semantic encoding in previous empirical research (Kelin & Khilstrom, 1986). Due to the nature of the text, Story B contained several emotive words, such as excruciating pain, or easily visualisable images, like an ambulance with flashing lights. Increased focus on such words could have counteracted the possible interaction effect with the other moral story. Although, when we looked solely at Story A in one of our subsidiary analysis, we did not find any interaction between self respect and the moral content there either.

Finally, we should not overlook the possibility that being worthy of honour because of one's high personal moral standards is not central to someones's self-respect concept. As the construct could also be defined in other ways, for example as people's ability to see themselves having the same basic rights and dignity as others (Renger, 2018). In this case, it may be considered a futile exercise to look for interaction between self-respect and sensitivity to moral information.

Possible explanations for relationship results between variables. Just like in the case of the interaction outcome described in the preceding paragraph, the analysis of the relationship between self-respect and two eye tracker measures of cognitive effort (eye fixation and pupil dilation) and recall did not yield the desired results. Even though our hypotheses need to be rejected here too, the significant negative relationship between self-respect and cognitive effort found in the ANCOVA analysis of eye fixation over the two stories, (the strong trend for a negative relationship between self-esteem and eye fixation over the two stories and the strong trend for a negative relationship between self-respect and recall over the two stories) are noteworthy and give food for thought. First of all, the negative relationship between self-respect and eye fixation measures over the two stories was stronger than the negative relationship between self-esteem and eye fixation over the two stories. No relationship was found between self-esteem and recall, but a relationship exists for self respect, supporting the call to move away from using global self-esteem measures to predict performance towards a more subtle, specific construct level investigation. As Rosenberg and colleagues (1995)

point out that global self-esteem relates more to psychological well-being but specific self-esteem relates more to behaviour. Self-esteem can not only be studied at different levels within the construct, but its motivational effect seems to have different levels as well (Walker, Green, & Mansel, 2006). If we studied self-esteem and self- respect at situational level we might have had much lower results on each scale, resulting in the change in the relationship patterns between the aforementioned constructs and cognitive effort measures.

Attainment of self-respect and compensation. If the results are accepted to be valid as they are, that participants with high levels of self-respect and global self-respect engaged less with the tasks, the answers to the question why they withheld effort could lie in the stability of these constructs. Participants with secure self-esteem and possibly secure self-respect, (although more research need to be conducted in this field), are not affected by the possibility of failure as much as those with less secure self-esteem and self-respect. The latter ones strive more for success or try harder to avoid failure to attain their self esteem and self-respect levels (Ferradas, et al., 2015). The result can also be interpreted from an effort-based decision making perspective. As people tend to minimize the effort made towards completion of a task (Westbrook & Braver, 2015), it appears that the individuals with high self-respect judged the cost of expending cognitive effort greater than the possible benefits or they simply judged the task too easy, that is why they withheld effort. There was no target set, participants were asked to do their best and remember as much as thay could.

Even if the interaction between self-respect and self-esteem was not significant, it is still likely that subconsious activation of the memory of one's own moral or immoral actions, according to the self-completion theory, would lead to compensatory behaviour (Jordan, Mullen, Muringhan, 2011). The results showing that after reading the morally charged story A first, participants recalled more from both stories and those who recalled more were people with lower self-respect, seem to support this idea. It would also provide an alternative explanation as to why people recalled more from story B when they read it second. It was due to engaging more after reading story A first and not because of the practice effect.

Motivational ambiguity. There is no doubt that all the participants displayed behavioural engagement during the experiment as they were cooperative and seemed fully focused, however, they might not have understood the importance or magnitude of the research. Since they could not identify with its value, their autonomous motivation was therefore driven by their core values and personal sense of morality, to expand more cognitive engagement not activated as much as it should have been. On top of this, if people with high self-respect consciously tried to conform, for instance to avoid shame, as their displayed behaviour implied, their controlled motivation might have lead to lower scores on cognitive effort measures as controlled motivation has been shown to negatively relate to performace (Ryan & Deci, 2008).On the other hand, research supports that there is higher intrinsic motivation for attainment of respect for people with lower self-esteem and additionally, they might have felt a stronger need to please the researcher and were led more by external factors. These theories might be applicable to self-respect as well, but more research needs to be done in the field (Elliot & Thrash, 2004).

Task difficulty. The findings suggest that if the recall task proved to be too difficult, out of fear of failure participants employed a self-protecting strategy, such as self-handicapping behaviour. However, research contradicts this idea as self-esteem and self-handicaping behaviour have been shown to have a negative relationship (Lobel &Teiber, 2004, Bramante, 2015). A more likely explanation is that higher level of self-respect comes with a higher level of test anxiety; therefore, they could not concentrate as much (Ferradás, et. al., 2015)

Other factors undermining cognitive engagement. The negative relationship between self-esteem and poor academic performance found repeatedly in empirical research called the attention to the importance of examining the confounding effects of self-efficacy on outcomes (Lawrence, 2008). According to Bandura's self-efficacy theory, if the participants' beliefs about their ability to successfully complete the tasks had been strong enough, their motivation to participate should have allowed them to adopt an achievement goal and perform well (Greene & Miller, 1996, Deci & Ryan, 2000). It is possible that our participants who had high global self-esteem and self-respect were actually motivated to perform well but they they did not believe in their capability to succeed, because

of their past experience or they had not been in a similar situation for a long time (Tafarodi & Swann, 1995). It is not only self-efficacy that should be measured together with global self-esteem and self-respect, but self-confidence as well, when studying these variables in relation to performance related behaviours. Greene & Miller (1996) claimed that higher confidence in succesful task completion leads to deeper cognitive processing strategies.

Once again, it is necessary to revisit the thought that being a honourable and principled person might not be central to our self-respect concept. If autonomy and dignity form the core of the construct, it would motivate people to engage more if their independent decision making ability, self-control, persistance and determination were tested (Renger, 2018) instead of their recall skills. Being an affective trait, self-respect could perhaps have a strong relationship with emotional engagement, which might affect cognitive engagement too.

5.2 Implications

Firtsly, we believe that future research would benefit from methods which could separate people with high explicit but low implicit self-esteem, from people who have high implicit self-esteem. In order to do this, we need to look beyond self-reports. It might seem too time-consuming, but obtaining validating evaluative feedback or assessment from family members, friends and colleagues is still feasible if we utilise online data collection tools. Using techniques which have the potential to reveal information that otherwise would be withheld or remain undisclosed because they are the results of unconscious mental processes could also be beneficial. One example is the Thematic Apperception Test (TAT), which could complement self-report measures. Although, such test need more skills when scoring (Conklin & Westen, 2001). Secondly, it would also be useful to study the link between self-respect and secure self-esteem, where research has been scarce. Thirdly, it would be worth designing a stimulus that requires a deeper engagement, perhaps one with a learning goal, instead of a shallow engagement with a performance goal. By posing a challenge, where participants need to form meaningful links between new and existing knowledge, and would have to persist in an effort throughout the task could test the true powers of self-respect. However, it could be even better to have one reading and recall task with moral content and a task with a quick learning goalt hat would

provide opportunity to test the interaction with the different task type, together with sensitivity to moral information. The importance of performing well in both tasks for the success of the experiment should have greater emphasis too, perhaps by giving examples of possible implications of the findings to the participants to further evoke their motivation connected to the self-respect trait. Finally, we need to expand our understanding of how self-respect relates to other constructs that impact cognitive engagement and achievement, for instance self-efficacy, preferably at task level.

5.3 Limitations

Firstly, the participants in the study might not have been representative of the whole population of the country, especially in terms of age and gender distribution, so the findings are hard to generalise. Secondly, the sample size was quite small. Power analysis before the study suggested that, while 40 participants were acceptable, 60 would have been optimal. Thirdly, there are some inherent limitations in basing a research on self-report surveys as the respondents' answers to the items on the questionnaire may not have represented their true opinions and feelings (Roseman, Tennekoon, & Hill, 2011). It especially holds true in case of the self-respect scale where people might not admit, even to themselves, that they do not always live according to their internal values and moral standards, just to protect their ego. Fourthly, even if there had been significant interactions between the study variables, it could not have been definitively asserted that different levels of self-esteem and self-respect caused the participant to expend cognitive effort, because of confounding variables and the correlational nature of the design. Finally, eye tracker research results are difficult to replicate due to the differences in eye tracker system algorithms: "To date, it has been well documented that given the same set of eye movement data, fixation detection algorithms can output very different results"(Holmqvist, Nyström, & Mulvey, 2012, p. 23).

6. Conclusion

In the current study, the relationship patterns between self-report measures of self-respect, global self-esteem, and cognitive effort were explored as measured by story recall and also by eye tracker measures of eye fixation and pupil dilation while reading a morally neutral and a morally charged story. The outcome did not support any of our hypotheses: Firstly, no significant interaction between self-respect, self-esteem and the story type was found.This outcome suggests that there is no link between cognitive effort and the moral aspect of self-respect or the encoding of moral information was either too difficult or was overridden by a non-self-referent processing strategy. Secondly, our results did not present the predicted positive relationship between self-respect, global self-esteem and cognitive effort. However, some interesting findings which justify further research emerged. Self-respect does seem to have some relationship with cognitive effort as shown by the results of eye fixation measures over the two stories and also by recall. Importantly, this relationship was found to be stronger than the relationship between global self-esteem and cognitive effort, supporting the notion that self-respect could be a key construct in predicting achievement-related behaviour. The fact that the relationship was negative implies that possibly secure high self-respect shields us from the likely negative consequences of a failure to our self-worth. Additionally, self-respect appears to be linked to different types of motivation, each having a different, and occassionally contraproductive effect on performance. Perhaps more factors undermine or confound cognitive engagement than was originally thought, such as task difficulty, self-efficacy or self-confidence. All of these prompt us to finely tune the experimental design to be able to measure the independent variables and the covariates at the task level and on different types of tasks as well. For instance, a task that has a learning goal to promote deeper processing and one recall task with moral content. It would allow us to discover the true potential of self-respect and to test further if the moral aspect of the construct has any significant role in cognitive engagement.

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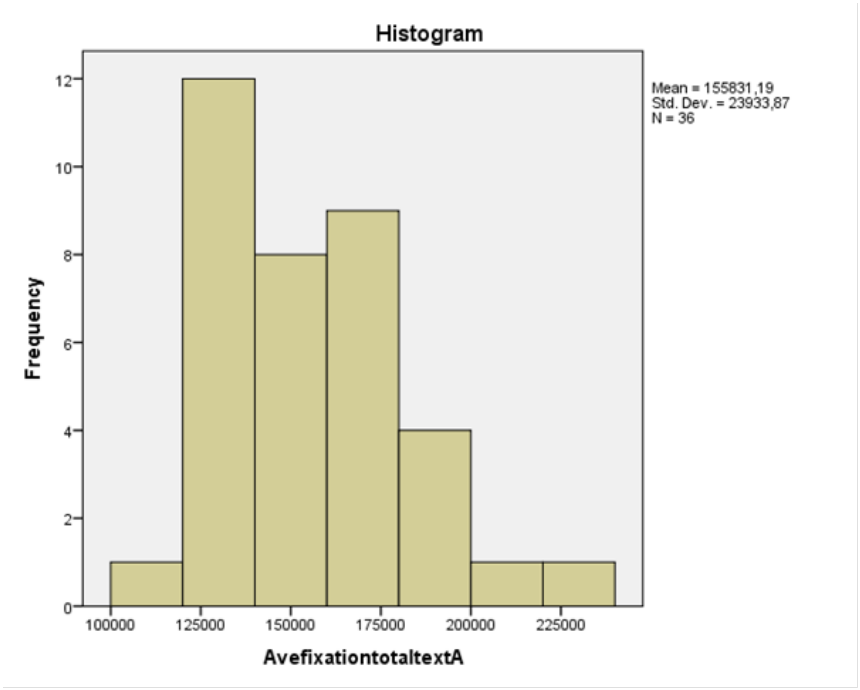
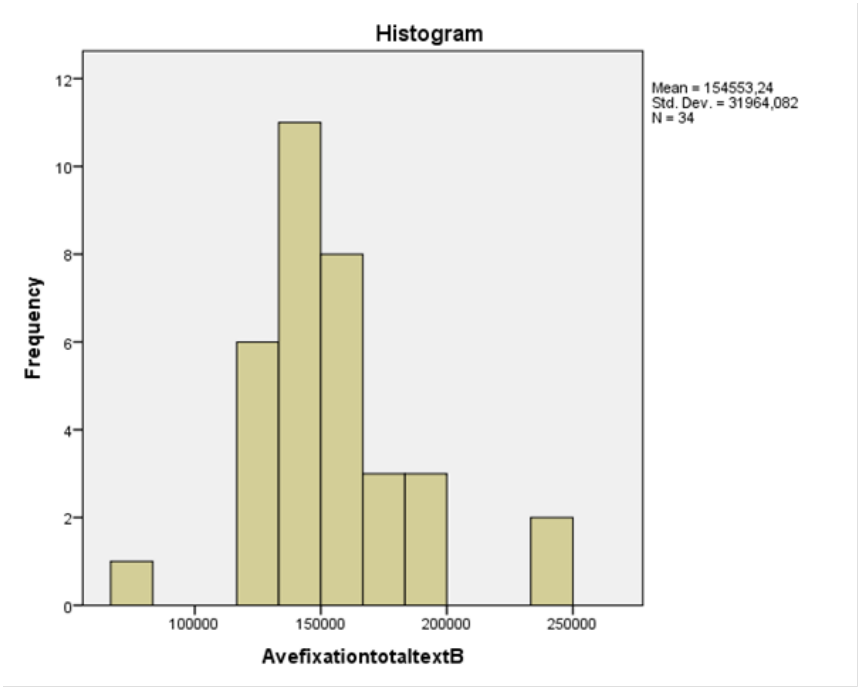
8. Appendices

Appendix A - Histograms of normality tests

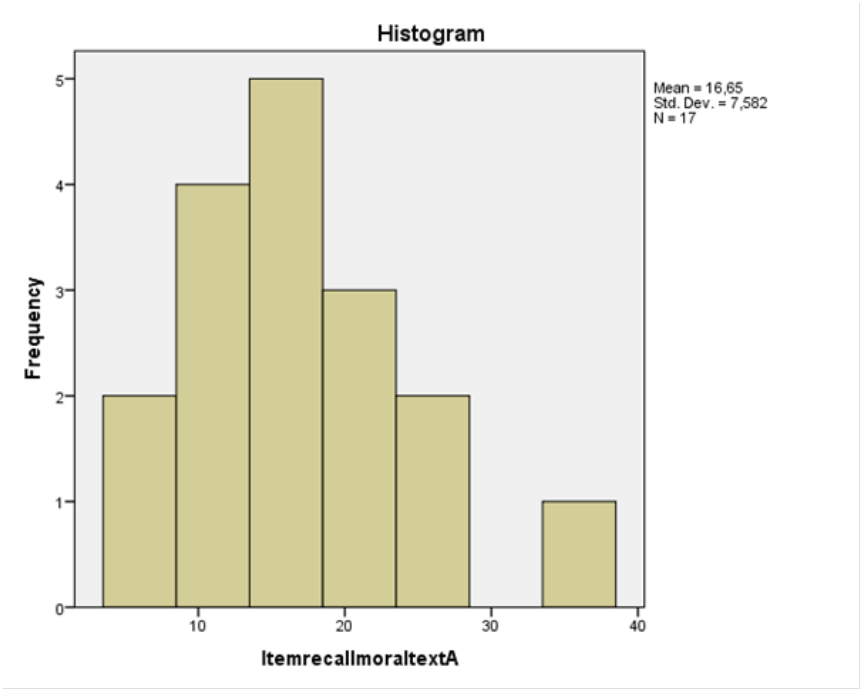
1. Eye fixation total text A



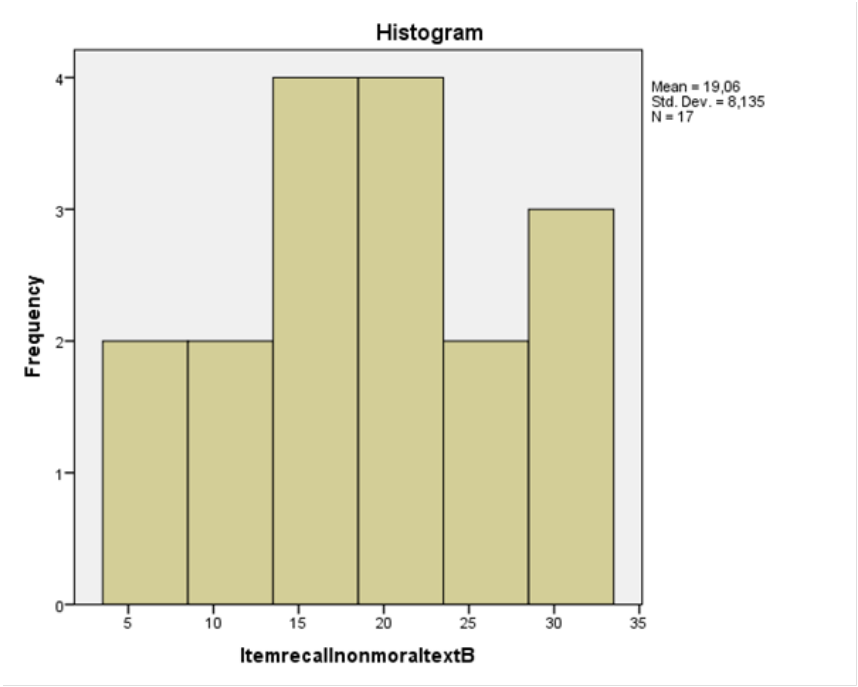
2. Eye fixation total text B, (after removing extreme outlier 38)



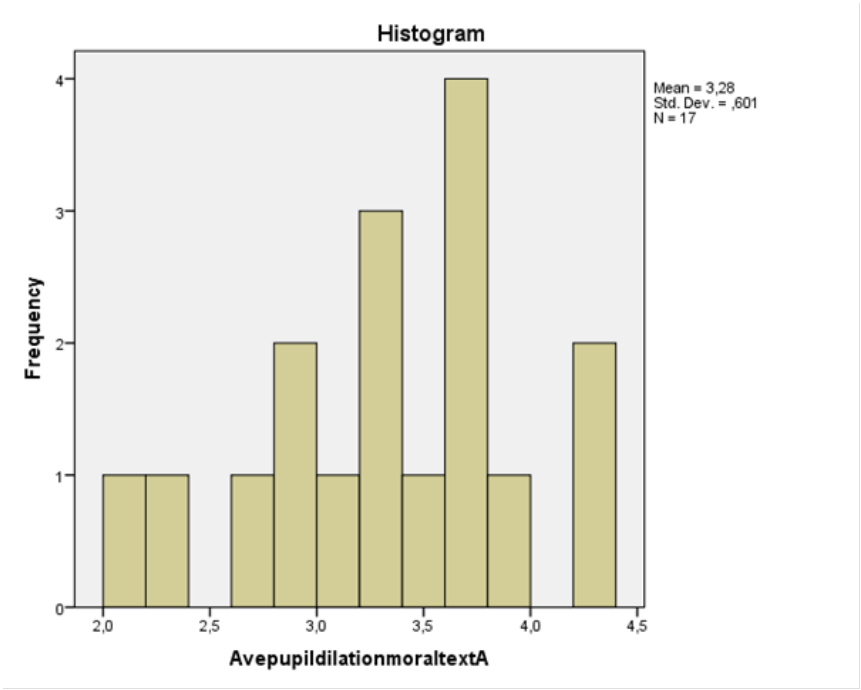
3. Total item recall A



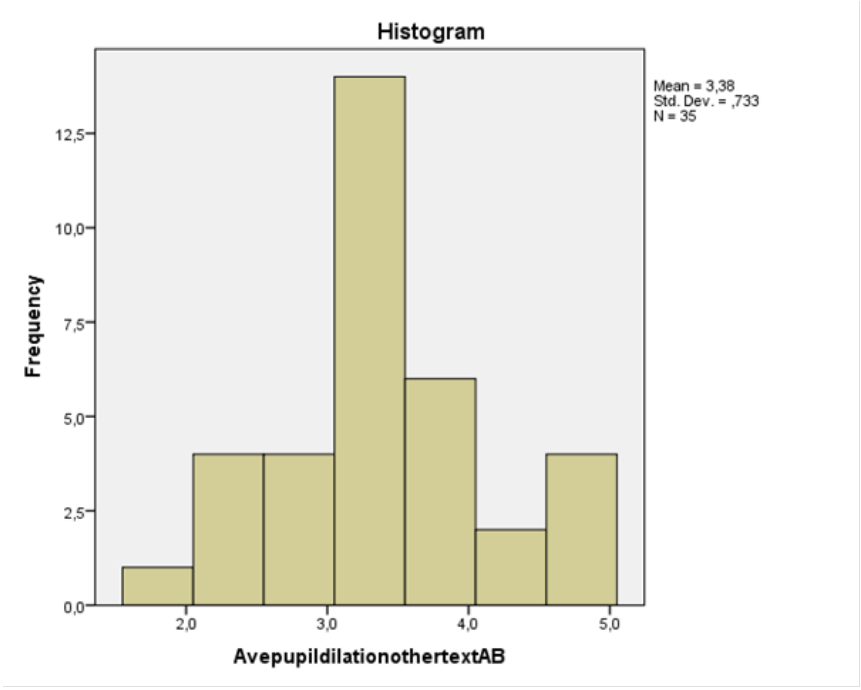
4. Total item recall B



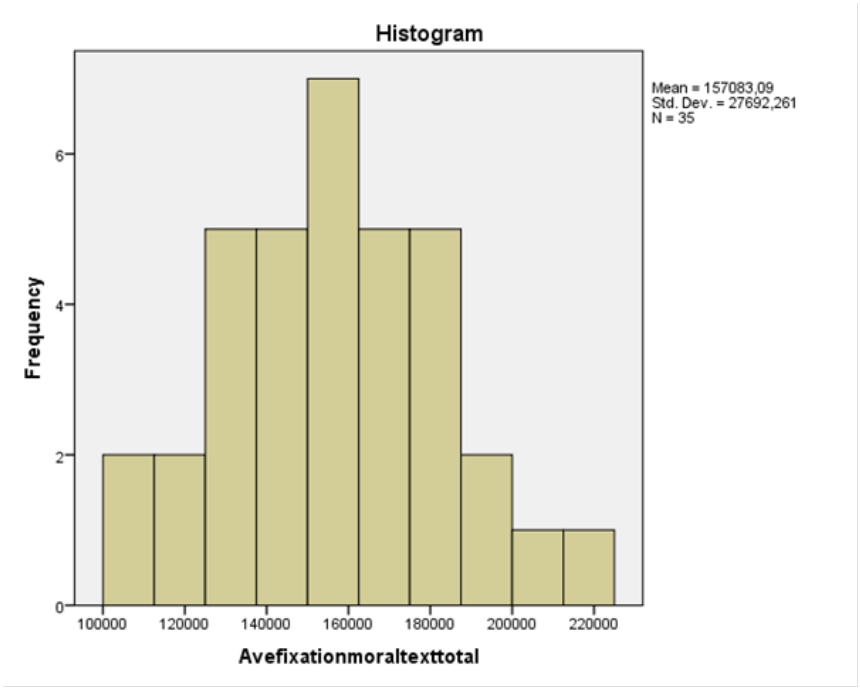
5. Pupil dilation total moral text A



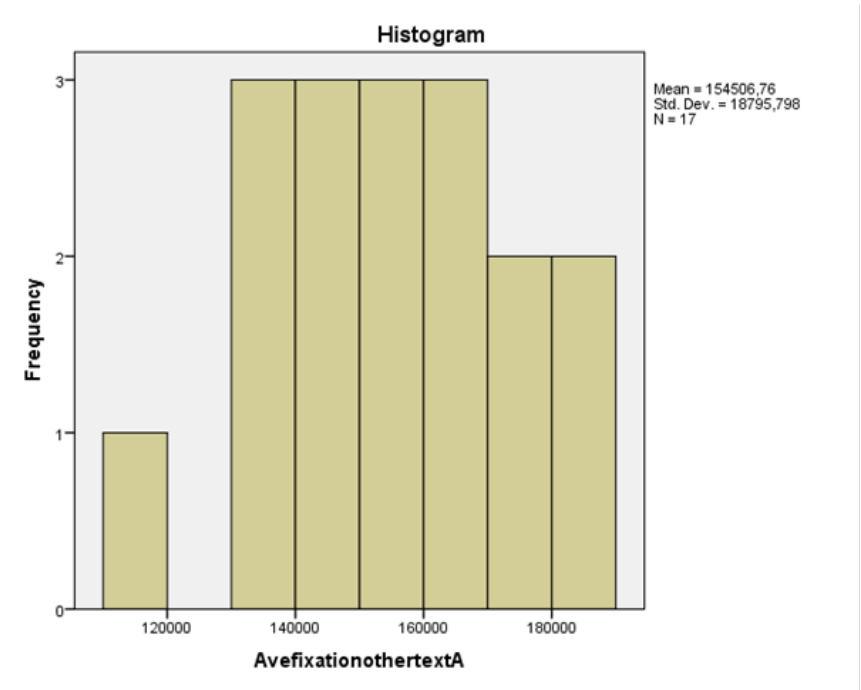
6. Pupil dilation total other text AB



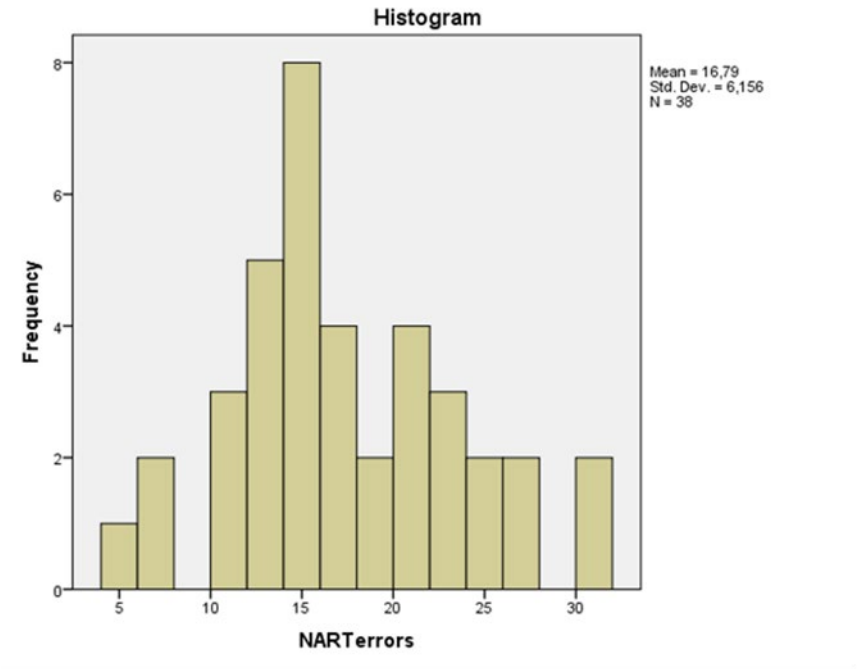
7. Eye fixation total moral text A



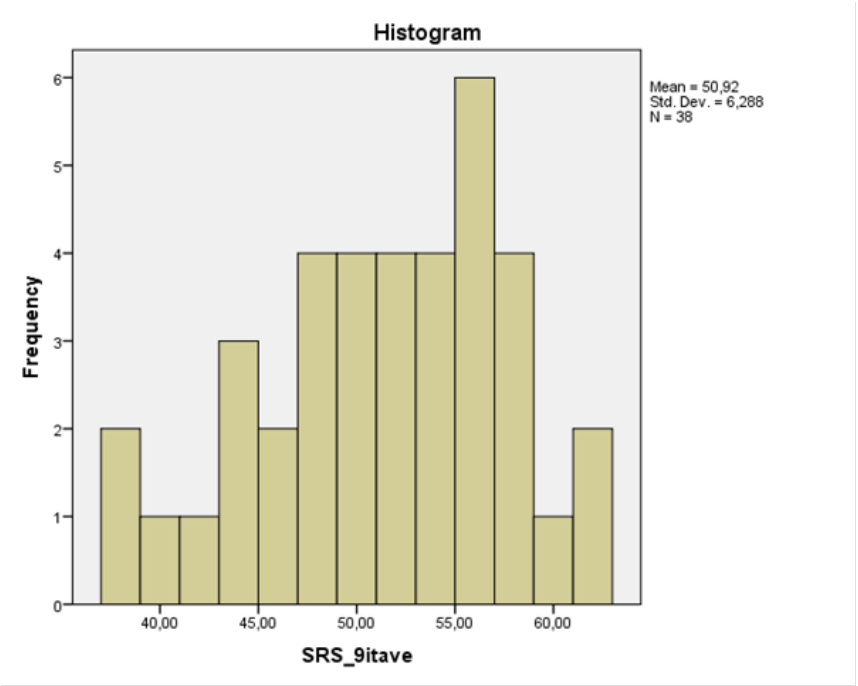
8. Eye fixation total other text A



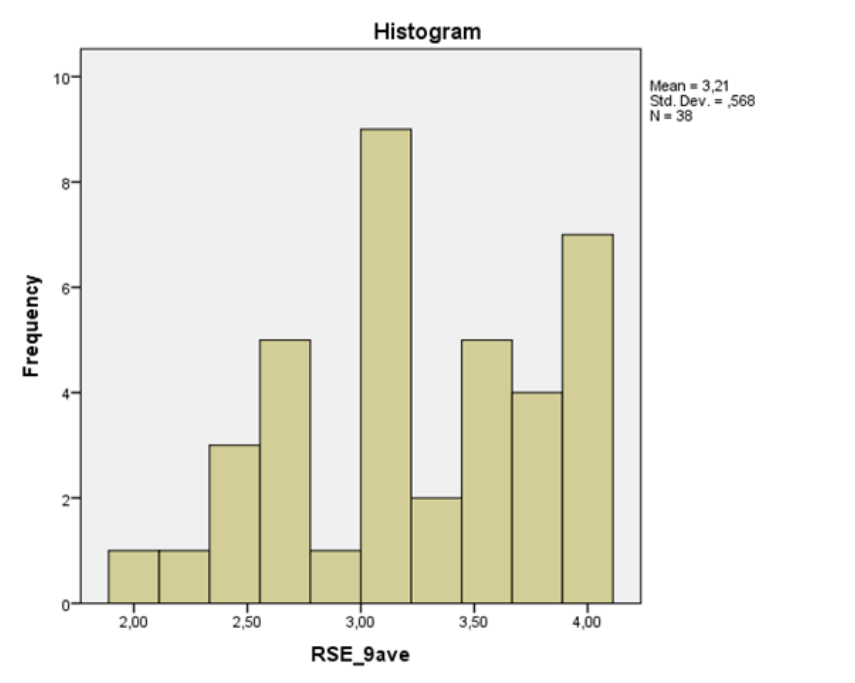
9. NART errors



10. Self-respect scale (9 item)



11. Self esteem scale (9 item)



Appendix B – Full Ethics Application (starts overleaf)