

The Influence of Incorporating Positive Self-Affirmations on State Self-esteem and the Role of Emotional Intelligence

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Preface

I would like to thank Eriko Fukuda for her invaluable guidance leading to the writing of this thesis. Her patience and thorough feedback have helped me a great deal and I have benefited greatly from her insights about my content and analysis.

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Self-esteem is a vital part of our mental health and motivation. The current study investigates the effect of positive self-affirmations on state self-esteem and the role which emotional intelligence plays on behavior change. An experiment was conducted by 108 participants consisting of a pretest and posttest with a time interval of seven days between tests. Participants were randomly assigned to either a control group or an experimental group. The control group watched a neutral video and the experimental group watched an educational video about positive affirmations. During the pretest and posttest, participants' state self-esteem level, emotional intelligence level, and use of positive affirmations were measured. The results show that participants in the experimental group use significantly more positive affirmations than participants in the control group but that their state self-esteem is not significantly higher after using positive affirmations. Additionally, the results show that participants that have a higher level of emotional intelligence also have a significantly higher level of state-self esteem but are not more likely to adapt their behavior and implement positive affirmations in their life.

1. Introduction

Self-esteem is decreasing by the increase of frequent social media usage (Vogel et al., 2014) and the isolation of the COVID-19 pandemic (Vall-Roqué et al., 2021). Low self-esteem is a predisposing factor of bad mental health resulting in anxiety or depression (Mann, 2004; Orth et al., 2016) and aggression and loneliness (Dittmann, 2005). The use of positive self-affirmations has been shown to improve the level of self-esteem as well as decreasing stress and improve problem-solving (Creswell et al., 2013).

This study focused on two objectives. The first objective investigated whether people that include positive self-affirmations in their life also have higher state self-esteem: *Does incorporating positive self-affirmations in the participants' life improve state self-esteem?* The second objective investigated the effect that someone's emotional intelligence level has on behavior change: *Does the level of emotional intelligence of the participants impact the effect an educational video has on behavior change?* To answer these research questions an experiment consisting of a between-subject design was created. Participants' change in the use of affirmations and state self-esteem scores was measured with an interval of seven days. Where the control group watched a neutral video and the experimental group watched an educational video about positive affirmations.

The scientific relevance was to give more insights into the role of emotional intelligence in the improvement of state self-esteem. The societal relevance of this present research was to find a technique that people could utilize to improve their self-esteem by implementing positive affirmations in their routine.

2. Theoretical framework

This thesis explores whether there is a connection between positive self-affirmations and state self-esteem. The first section (2.1) discusses self-esteem and its importance. The second section (2.2) explains the theory behind self-affirmations, their benefits, and their effect on self-esteem. Finally, this section will connect the theory about self-esteem and self-affirmations. The second objective of this thesis focuses on the effect that emotional intelligence has on behavior change. Therefore, the third section (2.3) will discuss emotional intelligence and the role emotional intelligence plays in health-promoting behaviors. The final section (2.4) formulates hypotheses related to the research questions.

2.1 Self-esteem

Self-esteem theory

Self-esteem is a person's sense of personal worth (Blascovich & Tomaka, 1991). Maslow's Hierarchy of Needs (Maslow, 1943) is a model containing five core hierarchical levels for human behavioral motivation. The first level consists of the basic needs for food, water, warmth and rest. The second level is about safety needs such as good health and security. The third level is about psychological needs, which are the needs for belongingness and love. The fourth level is esteem needs and the final level is self-actualization. Maslow divides esteem needs into two categories. The first category is self-esteem that comes within someone such as confidence. The second category is the desire for respect and social acceptance from others such as status. People are more motivated to reach their goals and take care of themselves when they have higher self-esteem. Maslow suggests that self-esteem is needed to grow as an individual and reach self-actualization. Additionally, it gives a person the motivation to reach their goals, set boundaries, and maintain healthy relationships with others and themselves. Both self-esteem categories are connected because the need for internal acceptance is necessary for any external validation to have a significant effect on someone (Komninos, 2021).

Brown and Marshall (2006), define three types of self-esteem: Global or trait self-esteem, state self-esteem and domain-specific self-esteem. Trait self-esteem is the way people generally feel about themselves. State self-esteem is about temporary feelings of self-worth. Domain-specific self-esteem is about how people assess their attributes and abilities. This thesis focuses on state self-esteem due to the short time period of the experiment.

Effects of self-esteem

Higher self-esteem improves mental health and social behavior as it acts as a buffer against negative influences. It does so by providing protection against feelings of anxiety in response to threats (Greenberg et al., 1992). Other benefits of high self-esteem are being able to cope with stress, having more empathy (Vanbuskirk, 2021) and being happier and more assertive (Baumeister et al., 2003). Low self-esteem is associated with internalizing problems such as eating disorders, suicidal thoughts and externalizing problems such as substance abuse and violence (Mann, 2004). Lower state self-esteem also leads to lower life satisfaction and loneliness (Bozorgpour & Salimi, 2012). Other downsides to low self-esteem are, among other things; anti-social behavior (Baumeister et al., 2003), impaired academic performance, hostility, negative body image, feelings of worthlessness, oversensitivity and self-hatred (Webber, 2021).

A healthy level of self-esteem is crucial because it influences the decisions people make. However, when a person has a form of excessive self-esteem it can be considered a sign of arrogance or

narcissism (Vanbuskirk, 2021). This happens when a person's ego inflates, they have a sense of entitlement and feelings of superiority. The key difference is that people with a high level of self-esteem do not feel better than others, compared to people with narcissistic tendencies (Brummelman, 2017).

2.2 Self-affirmations

What are self-affirmations?

Self-affirmations are the act of affirming one's value for a beneficial effect (Critcher & Dunning, 2014). Self-affirmation theory (Steele, 1988) proposes that people have a fundamental motivation to perceive themselves as good and maintain their self-integrity. If people's self-image is threatened by one attribute of their life, they can reinforce their image by highlighting other values and so maintaining a positive global perception of themselves. One way of maintaining their integrity is by using positive self-affirmations. Self-affirmations can be done by recalling aspects someone values about themselves or by stating positive statements. An example of a positive affirmation is to say "I am strong". To receive the desired positive results one must repeat the statements. Thinking of positive self-images has shown to result in higher levels of explicit self-esteem (Hulme et al., 2012) which is about the thoughts people have about themselves.

When to use affirmations?

Critcher et al. (2010) conducted four studies to find the ideal time to perform self-affirmations. They found that self-affirmations that were used before the defensive response reduced defensive conclusions more than ones after the threat. Furthermore, affirmations that were done after the threat were only useful when the defensive conclusion had not been reached yet.

Ferrer and Cohen (2018) developed a framework in which they concluded that self-affirmations have the most influence on behavior when there is a threat to self. Self-affirmations are ideally implemented when there are resources to support the change in behavior such as a program or educational information. To have the most positive effect, self-affirmations have to occur near the moment of psychological threat. This is in line with the results of Critcher et al. (2010).

Advantages and disadvantages

Self-affirmations have been shown to decrease levels of stress, improve problem-solving, increase self-esteem and boost academic achievement in school (Creswell et al., 2013). The effect of positive affirmations has been demonstrated in several studies. Zhao and Epley (2020) conducted an experiment to investigate the effect of positive affirmations over the span of a week on 400 participants. The researchers tested whether people's experiences with positive affirmations would change after receiving repeated compliments and positive phrases. The result showed that participants responded positively to each new complement or phrase and that the effect stayed constant. The participants also considered each compliment as sincere. The positive affirmations proved to have a significant positive effect on a person's self-worth.

Positive affirmations also have downsides. Briñol et al. (2020) found that positive affirmations can produce the opposite effect in people with low self-esteem. The feeling of self-confidence that is induced through affirmations magnifies current thoughts. Meaning that when people are thinking negatively about themselves or a situation in general, a positive affirmation can give a negative effect. An example is intensifying the impact of doubt. Wood et al. (2009) also conducted a study where the effect of positive affirmations on people was studied. This experiment showed that positive affirmations only affected people with higher state self-esteem. People with low state self-esteem felt worse after using positive

affirmations. On the contrary, when Flynn and Bordieri (2020) reconstructed the experiment they found no differences and therefore failed to replicate that the level of state self-esteem influenced the effect of positive affirmations. Flynn and Bordieri (2020) hypothesized that a reason for their non-significant result could be that the participants in the positive affirmation condition could not create their affirmations. Steele (1988) emphasizes the importance of using affirmations that people value about themselves and that resonates with them.

Self-affirmations and self-esteem

Researchers have investigated different methods to improve self-esteem such as cognitive-behavioral therapy (Taylor & Montgomery, 2007), classical conditioning (Baccus et al., 2004), group interventions (Borras et al., 2009) and social skills training (Bijstra & Jackson, 1998). Yet research about the influence of self-affirmations on self-esteem is limited. Some examples of research that did investigate the connection between self-affirmations and self-esteem are as follows: Düring and Jessop (2014) researched how self-esteem is a possible mediator of the effects of self-affirmations. The study found that self-affirmations are more effective if participants have low self-esteem. It did not affect participants with high self-esteem. But these results contradict what is found in other studies where a low level of self-esteem is not a possible mediator of self-affirmation effects (Flynn & Bordieri, 2020; Wood et al., 2009). Another study by Lindsay and Creswell (2014) showed that participants who spend three minutes writing about their values have an increase in self-compassion but that the underlying mechanism for these effects was still unknown. Lynch and Graham-Bermann (2000) investigated how self-affirmation could increase the self-esteem of women that have experienced physical violence in the past. Results in this experiment found that 20% of the variance was significant in the improvement of self-esteem. However, the researchers stated that further research is necessary to understand and explain how self-affirmation acts as a protective function.

MCQueen and Klein (2006) wrote a systematic review about the experimental manipulations of self-affirmations. The goal of this paper was to identify research gaps and subjects for future research. They state that there is little support that shows the effect of self-affirmations on self-esteem and it calls for further research. The current research does not investigate whether self-esteem moderates the impact of self-affirmations but rather if self-affirmations have a positive effect on self-esteem itself.

2.3 Emotional intelligence in behavior change

Emotional intelligence

Emotional intelligence is a set of skills that make someone capable of controlling, expressing and being aware of the emotion in themselves or others. A higher level of emotional intelligence provides people with the skill to reduce the impact of negativity in their lives as well as the ability to cope with setbacks. It also increases the competence in maintaining social relationships, which results in acceptance and higher levels of intimacy (Salovey & Mayer, 1990). High emotional intelligence levels also help make better decisions (Ruiz-Aranda et al., 2012) and improve self-esteem (Bibi & Saqlain, 2016).

Ruiz-Aranda et al. (2012) found that students with a higher level of emotional intelligence are less likely to have problems with emotional overreaction and psychological problems that manifest externally such as aggression. While people with a lower level of emotional intelligence showed to be more inclined to engage in harmful behavior. Emotional intelligence shows to be vital to psychological functioning. Extremera and Fernández-Berrocal (2006) conducted a study with 184 students in which they investigated if a certain level of emotional intelligence could be a predictor of social, physical and mental health. Results showed that higher levels of emotional clarity and the ability to interrupt negative moods and

extend positive ones, also known as mood repair, were related to lower levels of depression and anxiety. As well as better general health and mental health. However, higher levels of emotional attention, which is the ability to read emotions, were related to high levels of anxiety.

Emotional intelligence and health-promoting behaviors

Yip and Côté (2012) conducted a study about how emotional intelligence influences decision-making. They found that people often make decisions based on unrelated emotions. Examples of this can be that when people experience something that is frustrating at work, they will carry these emotions to other aspects of their life when making decisions. This phenomenon is more frequent in people with a lower level of emotional intelligence than people with a higher level of emotional intelligence. Hess and Bacigalupo (2011) found that people with a higher level of emotional intelligence were more able to assess the emotional outcomes of their decisions, therefore making decisions that were more likely to result in a positive outcome. These findings on decision-making could implicate that people with higher emotional intelligence levels would also make decisions to positively change their behavior sooner than people with lower levels of emotional intelligence. This implication overlaps with the results of a study by Espinosa and Kadić-Maglajlić (2018). They investigated the role of emotional intelligence in health-related behaviors. The study found that participants with a higher level of emotional intelligence also tended to participate in more healthy behavior than participants with a low level of emotional intelligence. People with a lower level of emotional intelligence also had a higher tendency to participate in unhealthy behavior (Espinosa & Kadić-Maglajlić, 2018).

Epton et al. (2015) wrote a companion paper in which they discuss key questions for future research about the impact of self-affirmations on behavior change. In the paper, Epton et al. state that more needs to be discovered about how self-affirmations change health behavior as well as the role of individual differences in the effectiveness of self-affirmations.

2.4 Hypothesis

The objectives of the current study were to investigate whether positive affirmations improve state self-esteem and to see if the level of emotional intelligence affects behavior change. Based on the research described in this chapter, the following hypotheses were created:

Hypothesis 1. *“Participants in the experimental group, who are exposed to an educational video about positive affirmations, will have a higher increase in state-self esteem than participants in the control group.”*

Hypothesis 2. *“Participants in the experimental group, who are exposed to an educational video about positive affirmations, will use more positive affirmations than participants in the control group.”*

Hypothesis 3. *“Participants with a higher level of emotional intelligence also have a higher level of state self-esteem.”*

Hypothesis 4. *“Participants with a higher level of emotional intelligence also have a higher positive difference in the use of positive affirmations.”*

3. Methods

A between-subject design was used to examine the effect of positive affirmations on state self-esteem. Another objective was to research the role of emotional intelligence on behavior change. This study consisted of a pretest and a posttest. The current chapter reports the descriptive characteristics of the participants (3.1), the materials and instrumentation used during the study (3.2) and the procedure of the experiment (3.3).

3.1 Participants

The sample included 108 participants that were recruited via a combination of convenience sampling and snowball sampling methods. Of the sample, 21 participants did not complete the study. Five participants did complete the self-esteem questionnaire and emotional intelligence questionnaire but did not leave an email address or the email address was not valid. The remaining 16 participants that did not complete the study, only filled in partial information. All the data that was incomplete were omitted from this study.

The participants were randomly assigned to either the control group ($n = 42$) or the experimental group ($n = 45$). Participants in the control group were between the ages of 20 and 29 years old ($M = 23.79$, $SD = 2.10$). Participants in the experimental group were between the ages of 18 and 42 years old ($M = 23.73$, $SD = 3.83$). There were more females ($n = 53$) than males ($n = 34$) participants. Of all the participants 76 were full-time students and 11 were not students. All participants signed a consent form prior to participation and were required to be 18 years or older.

3.2 Materials and Instrumentation

The surveys were designed using Qualtrics (Qualtrics, 2005). Statistical analysis of the data collected was done using RStudio 1.3.1093 (Rstudio, 2009).

Demographic information

Participants were asked to answer questions about their age, gender and current student situation (*Full-time student, part-time student, not a student, prefer not to say*).

Self-esteem scale

Self-esteem was measured using a twenty-item State Self-Esteem Scale (Heatherton & Polivy, 1991). Responses to the questions were given using a 5-point Likert scale ranging from *Not at all* (1) to *Extremely* (5). An example item is "I feel that others respect and admire me". The State Self-Esteem scale had a Cronbach's alpha between .73 and .81 in previous research (Chau et al., 2008). In the current experiment the Cronbach's alpha was between an acceptable .70 and .73 (See appendix A for the State Self-Esteem Scale).

Emotional intelligence scale

Emotional intelligence was measured using the thirty-item Trait Emotional Intelligence Questionnaire - Short Form (TEIQue-SF; Petrides, 2009). Responses to the questions were given using a 7-point Likert scale ranging from *Completely disagree* (1) to *Completely agree* (7). An example item is "I would describe myself as a good negotiator". The TEIQue-SF had a Cronbach's alpha between .87 and .88 in previous research (Cooper & Petrides, 2010). In the current experiment the Cronbach's alpha was between .90 and .91 (See appendix B for the TEIQue-SF).

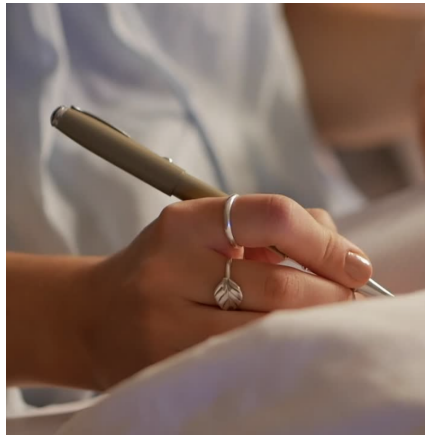
Educational video and neutral video

The educational video and the neutral video were made using Imovie (Imovie, 1999) and a MacBook Pro (macOS Catalina version 10.15.6). A three min long educational video was shown to the participants in the experimental condition. The educational video contained music (BenSound, 2012) and modified videos (Pexels, 2021). The voiceover contained information about what positive affirmations are, the benefits of using positive affirmations and advice to make and implement positive affirmations

(See Figure 1 for a screenshot of the educational video including an excerpt of the script; See appendix C for the full script including screenshots of the educational video). A three min long neutral video was shown to the participants in the control condition. The neutral video consisted of atmospheric images relating to nature (See Figure 2 for a screenshot of the neutral video). The effect of using a video to enhance cognitive performance has shown to be an effective tool in previous research (Allen Moore & Russell Smith, 2012; Hsin & Cigas, 2013; Lloyd & Robertson, 2011). Due to the Pandemic, using a video is also an efficient tool to convey a message that can be used while social distancing.

Figure 1

Screenshot of the educational video about positive affirmations



Avoid negative wording

Make a statement that resonate with you

Use present tense

Keep it brief and specific

Note: An excerpt of the script: “First, you need to make your affirmations. A few things to keep in mind are to avoid negative wording. So instead of saying “I won’t be ignored” say “I am worthy and my opinion matters”. Another key factor is to make sure your affirmation resonates with you as an individual. Use present tense instead of future tense. So instead of saying “I will become more intelligent” say “I am intelligent”. And finally, keep your affirmations brief and specific. A tip to make it easier is to start your affirmations with “I am”.”

Figure 2

Screenshot of the neutral video about nature



Note: The neutral video contains seven similar clips of nature scenes.

Questions regarding positive affirmations

The positive affirmations section contained questions regarding if the participants knew what positive affirmations were, if they already use positive affirmations, and finally how many times they used positive affirmations in the past seven days.

3.3 Procedure

Participants were randomly assigned to either the control group ($n = 42$) or the experimental group ($n = 45$) using the randomizer function in Qualtrics (Qualtrics, 2005). Participants were asked to fill out the first survey for the pretest which took approximately ten minutes. During the pretest, participants answered questions regarding their demographic information, a self-esteem scale, an emotional intelligence scale and questions regarding the use of positive affirmations. Additionally, the participants watched either the video about nature or about positive affirmations. At the end of the pretest, the participant's email address was asked. After seven days the participants were asked to fill out the second survey for the posttest, which took approximately five minutes. The posttest contained the same self-esteem scale and questions regarding the use of positive affirmations. The participant's email address was asked again to connect the pretest and posttest data. After completing the experiment, participants were debriefed about the goal of the study and thanked for their participation. The participants were not compensated for their participation in the experiment.

4. Results

This chapter will discuss the results of the experiment. The first section will check the data for normality and homogeneity of variance (4.1). The second section will answer the first hypothesis *"Participants in the experimental group, who are exposed to an educational video about positive affirmations, will have a higher increase in state-self esteem than participants in the control group."* (4.2). The third section will answer the second hypothesis *"Participants in the experimental group, who are exposed to an educational video about positive affirmations, will use more positive affirmations than participants in the control group."* and discuss the results of other questions related to the use of positive affirmations (4.3). The fourth section will answer the third hypothesis *"Participants with a higher level of emotional intelligence also have a higher level of state self-esteem."* (4.4). The final section will discuss the fourth hypothesis *"Participants with a higher level of emotional intelligence also have a higher positive difference in the use of positive affirmations."* (4.5). The pretest and posttest data were connected manually using Google Sheets. The statistical analysis was done using Rstudio (Rstudio, 2009).

4.1 Testing of assumptions

Before running statistical analysis on the data, it was checked to see if it fit the assumption of normality and homogeneity of variance. The assumption of normality was checked using a Q-Q plot and by running a Shapiro-Wilk test. The assumption of homogeneity of variance was checked using a Fisher's F-test and by plotting a boxplot.

Self-esteem

The score of the state self-esteem scale in the pretest and posttest was checked for the assumption of normality. The Q-Q plots in the pretest and posttest showed a light tail (Appendix D). The

Shapiro-Wilk test showed that the pretest data in both the control group $W(40) = 0.96, p = 0.12$ and experimental group $W(42) = 0.98, p = 0.35$ are normally distributed. The data of the control group $W(40) = 0.96, p = 0.22$ and experimental group $W(42) = 0.98, p = 0.13$ in the posttest were also normally distributed. A Fisher's F-test and a boxplot (Appendix E) were conducted to check for homogeneity of variance, results showed that the data satisfied the assumption in both the control group $F = 1.10, p = 0.75$, and the experimental group $F = 1.53, p = 0.16$.

Affirmations

The Q-Q plots in the pretest and posttest show heavy tailed plots (Appendix F). The Shapiro-Wilk test showed that the data in the control group during the pretest $W(40) = 0.53, p < .0001$ and posttest $W(40) = 0.53, p < .0001$ are not normally distributed. The data in the experimental group in the pretest $W(44) = 0.48, p < .0001$ and posttest $W(44) = 0.91, p < .005$ are also not normally distributed. A Fisher's F-test and a boxplot (Appendix G) showed that the data satisfies the assumption for homogeneity of variance in the control group $F = 0.70, p = 0.26$ and experimental group $F = 0.55, p = 0.05$.

TEIQue-SF

The Q-Q plot showed a normal distribution in the control group and a light-tailed distribution in the experimental group (Appendix H). The Shapiro-Wilk test showed a normal distribution in both the control group $W(40) = 0.97, p = 0.33$ and experimental group $W(44) = 0.98, p = 0.64$. A Fisher's F-test and a boxplot (appendix L) showed that the data satisfies the assumption for homogeneity $F = 0.74, p = 0.35$.

4.2 Hypothesis one: Higher improvement in state self-esteem in the experimental condition.

The state self-esteem scale was used to measure the level of self-esteem of the participants. In the control group, the scale found a mean score of 3.57 (range 2.5 - 4.5, $SD = 0.53$) in the pretest. During the posttest, the self-esteem score of the participants had increased to a mean score of 3.60 (range 2.5 - 4.6, $SD = 0.50$) which is an increase of 0.03 points. In the experimental group, the state self-esteem scale found a mean score of 3.33 (range 2.05 - 4.35, $SD = 0.03$) in the pretest. During the posttest, the self-esteem score had increased to a total mean score of 3.49 (range 2.25 - 4.40, $SD = 0.47$) which is an increase of 0.16 points.

Because the self-esteem data met the assumptions of normality and homogeneity of variance, an independent sample t-test was conducted between groups using the difference in self-esteem scores as the dependent variable. The difference in self-esteem scores was calculated by subtracting the posttest self-esteem score from the pretest self-esteem score. People in the control group ($M = 3.60, SD = 0.50$) had a lower increase in state self-esteem than people in the experimental group ($M = 3.49, SD = 0.47$) but this difference 0.11, 95% [-0.25, 0.02] was statistically non-significant, $t(84) = -1.76, p = 0.08$. Therefore rejecting the alternative hypothesis "*Participants in the experimental group, who are exposed to an educational video about positive affirmations, will have a higher increase in state-self esteem than participants in the control group.*"

4.3 Hypothesis two: More use of positive affirmations in the experimental group.

Table 1 shows the answers to the questions regarding positive affirmations during the pretest in both conditions. Of the 30 participants in the experimental condition that did not use positive affirmations 44% expected to use positive affirmations after watching the video, 43% were neutral and 13% thought it was unlikely that they would implement positive affirmations in their routine. Of the 60 participants that used positive affirmations at the time of the posttest 95% stated they would continue to

use positive affirmations in their routine. Additionally, 85% believed that positive affirmations had a positive effect on their self-esteem.

Table 1

Results of the positive affirmations questions during the pretest of the experiment

	Pretest	
	Control group (n = 42)	Experimental group (n = 45)
Knew what positive affirmations were	62%	58%
Used positive affirmations	50%	33%
Use of positive affirmations	M = 1.76, SD = 3.43	M = 0.82, SD = 2.01

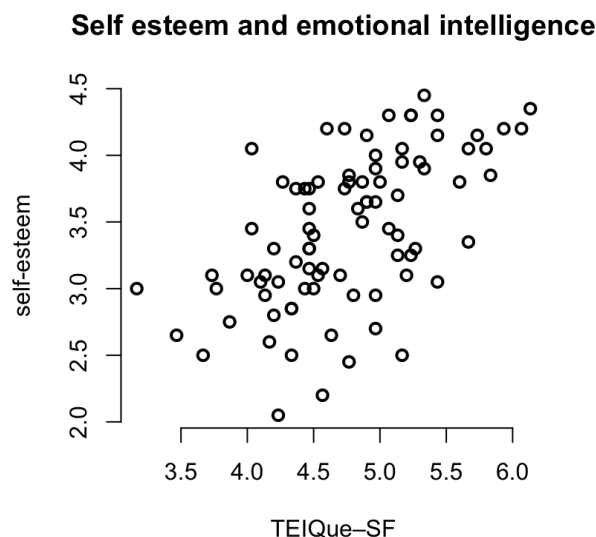
The data about the use of affirmations was not normally distributed but the assumption of homogeneity of variance was met. Therefore a nonparametric Mann Whitney U test was conducted with the difference in the use of affirmations in the control group ($M = 0.37, SD = 1.62$) and experimental group ($M = 2.24, SD = 2.23$) as dependent variables. The difference was calculated by subtracting the use of affirmations in the posttest from the use of affirmations in the pretest. The nonparametric one-tailed test showed to be statistically significant $W = 452, p < .0001$, failing to reject the second hypothesis *“Participants in the experimental group, who are exposed to an educational video about positive affirmations, will use more positive affirmations than participants in the control group.”*

4.4 Hypothesis three: A higher level of state-self esteem is correlated with a higher level of emotional intelligence.

The TEIQue-SF data met the assumptions for normality and homogeneity of variance. A parametric test can be used as the Likert scale contains quasi-continuous variables. A Pearson’s correlation test was conducted between the self-esteem score and emotional intelligence score. The results of the test show that the level of self-esteem and the level of emotional intelligence is positively correlated, $r(84) = .57, p < .0001$. Figure 3 shows a scatterplot that demonstrates the relationship between the state self-esteem score and the TEIQue-SF score in both conditions. The Figure is in line with the results of the correlation test, therefore failing to reject the third hypothesis *“Participants with a higher level of emotional intelligence also have a higher level of state self-esteem.”*

Figure 3

Scatterplot showing the relationship between emotional intelligence and state self-esteem

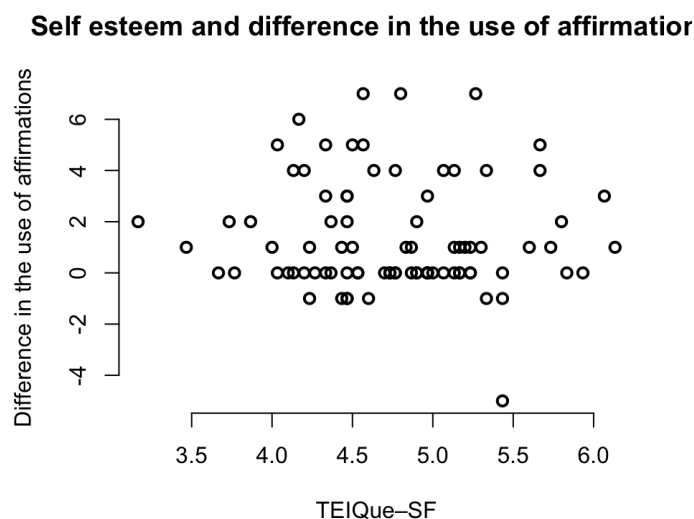


4.5 Hypothesis four: A higher level of emotional intelligence leads to behavior change.

Behavior change was measured by the difference in the use of affirmations. This is calculated by subtracting the number of affirmations used in the posttest by the number of affirmations used in the pretest. A Pearson correlation test was conducted between the participants' TEIQue-SF score and the difference in the use of affirmations. The test found a negative correlation between the emotional intelligence score and the difference in the use of affirmations, $r(84) = -.06, p = 0.59$. These findings are non-significant. Figure 4 displays a scatterplot in which the relationship between the two variables can be seen. The scatterplot shows no correlation. Therefore rejecting the fourth hypothesis "Participants with a higher level of emotional intelligence also have a higher positive difference in the use of positive affirmations".

Figure 4

Scatterplot showing the relationship between emotional intelligence and behavior change.



5. Discussion

This chapter will answer the research questions and discuss the results regarding the hypotheses (5.1). The second section will discuss the limitations of the study (5.2).

5.1 Answer the research questions

The first objective: Does incorporating positive self-affirmations in the participants' life improve state self-esteem?

The current study focused on two objectives. The first research question was "Does incorporating positive self-affirmations in the participants' life improve state self-esteem?". Based on this research question two hypotheses were created. Previous studies have argued that self-affirmations are an effective method to increase self-esteem (Creswell et al., 2013; Lynch & Graham-Bermann, 2000; Zhao & Epley, 2020). Additionally, other studies have contradicting findings, stating that when positive affirmations have a positive effect on self-esteem it is in participants with high self-esteem (Wood et al., 2009) or participants with low self-esteem (Düring & Jessop, 2014; Flynn & Bordieri, 2020). As stated in the first hypothesis, participants in the experimental condition were expected to have a higher increase in state-self esteem than participants in the control group. The outcome of the independent sample t-test suggests that this hypothesis is rejected. These findings are not in line with previous research.

The second hypothesis hypothesized that participants that were exposed to the video about positive affirmations would use more positive affirmations than participants in the control group. The outcome of the Mann-Whitney U test suggests that this hypothesis could not be rejected. These findings support previous research by Ferrer and Cohen (2018) who developed a framework which states that positive affirmations have a better effect when implemented in combination with educational information. In this experiment, educational information was provided within the video in the experimental group.

The results of the current study indicate that incorporating positive self-affirmations does not improve state self-esteem.

Second objective: Does the level of emotional intelligence of the participants impact the effect an educational video has on behavior change?

The second research question was “*Does the level of emotional intelligence of the participants impact the effect an educational video has on behavior change?*”. To answer this research question two hypotheses were created. Previous research states that having a higher level of emotional intelligence leads to higher levels of self-esteem (Bibi & Saqlain, 2016), increased physiological functioning (Ruiz-Aranda et al., 2012) and improved social skills (Salovey & Mayer, 1990). The second hypothesis states that participants with a higher level of emotional intelligence also have a higher level of state self-esteem. The outcome of the Pearson correlation test shows that the findings are in line with previous research. Participants with a higher level of emotional intelligence also had a higher level of state self-esteem.

The second hypothesis suggested that participants with a higher level of emotional intelligence also have a higher increase in the use of positive affirmations. Research by Espinosa and Kadić-Maglajlić (2018) indicated that participants with a higher level of emotional intelligence also had a higher tendency to participate in healthy behaviors. Additionally, Hess and Bacigalupo (2011) wrote in their research that people with a higher level of emotional intelligence were more inclined to make decisions that would result in a positive outcome. Unlike the research, the Pearson correlation test showed a non-significant negative correlation between emotional intelligence and the difference in the use of affirmations.

The results of the current study indicate that participants with a higher level of emotional intelligence also have higher self-esteem but it does not impact the effect the educational video has on behavior change.

State self-esteem, emotional intelligence and positive affirmations

The results of both research questions conclude that participants with a higher level of emotional intelligence also have a higher level of self-esteem but they do not use more positive affirmations than participants with a lower emotional intelligence level. The participants that do use positive affirmations also do not have a significant increase in their self-esteem level, even though they do use more affirmations after watching the educational video. Both research questions yielded negative results. The research about positive affirmations, self-esteem and the role of emotional intelligence is still limited. Therefore more research is needed. The current research contributes as an example for future research for when positive affirmations do not affect self-esteem. The potential cause of these negative results is discussed in the limitations section.

5.2 Limitations

The current study faced several limitations. The sample size was too small. A G*Power test

calculated that the adequate sample size should be at least 220 participants (Erdfelder et al., 2007) to generate more accurate values. Twenty-one participants of the 108 did not complete the experiment. Further data collection could solve this limitation.

Second, the current results reflect the impact of the educational video. In a replication of the current study, another active intervention should be implemented such as a physical motivation speech or virtual reality. In this way the impact of the video can be measured.

Third, the importance of timing of the positive affirmations were highlighted in previous research (Critcher et al., 2010; Ferrer & Cohen, 2018). This was not taken into account in the current study. The participants completed the experiment at a time in which they were available and presumably comfortable. This was also due to the final limitation.

Which is the Covid-19 Pandemic. Due to the restrictions of the government, the experiment had to be adapted so it could be conducted from a safe distance. This obstacle resulted in less control of the experimental conditions.

6. Conclusion

This study examined if self-affirmations had a positive effect on state self-esteem and if emotional intelligence plays a role in behavior change. To answer these questions four hypotheses were created. The answers to these hypotheses were found by conducting an experiment on 87 participants, using a pretest and a posttest with a time interval of seven days between tests. The results of the experiment did not support the main hypotheses. Participants that were exposed to the educational video about positive affirmations did not have an increase in state self-esteem, even though they did use more affirmations at the time of the posttest. Participants that had a higher level of emotional intelligence also did not change their behavior by implementing more positive affirmations in their lives.

The insight of these results is that emotional intelligence and self-esteem are positively correlated. However, in the current research it has no connection with change in behavior and participants' state self-esteem also does not increase after being exposed to the experimental condition.

Future research should be done on a larger sample size of at least 220 participants, including a third experimental group containing another active intervention. Recommended would be to take the timing of the positive affirmation into account when creating the experiment. Another direction of future research is to investigate why 87% of the participants believed that self-affirmations had a positive effect on their self-esteem even though this was not the case.

7. Self-reflection

In this final chapter of my thesis, I will reflect on my learning process. The goal of this thesis was for the students to conduct a quantitative research study in the field of cognitive science or artificial intelligence. I chose the direction of cognitive science. I had a few topics I wanted to do my thesis about which also caused my first stumbling block. During the process of writing my proposal I noticed that I found it hard to pick a specific subject to write my thesis about, this was caused by the fact that I found too many subjects interesting. By the time I had to hand in my final proposal, I knew I had to make a change. I used tactics I have used in previous courses such as mind mapping to make my idea more specific. I came to my final topic through my affinity with the power of positivity. I believe that this thesis could be tackling the fundamental problem of declining mental health, by showing insights into how to improve an aspect of it. In this case self-esteem. This first stumbling block could be prevented in the

future by having a clear overview of my project and sticking to it from the start. Having doubt about the direction of the project is counteractive.

Due to COVID-19 opportunities for the thesis were restricted. The regulations regarding social distancing and the national lockdown made it unfeasible and impractical to create an experiment containing real-life interaction with participants. Initially, I would have liked to implement a virtual reality aspect to my experiment but I changed that to an experiment that was fully available online. To implement a technical aspect I chose to create two short videos. One about positive affirmations and one about nature. To make these videos I used my video editing skills and my creative vision. I believe that the videos turned out professional, informative and well put together. I will take my creativity with me in future research projects. I believe that my background in creative education gives me a new way of looking at problems.

For the theoretical framework, I used the skills I learned during Methodology, to interpret research data from related articles. I used this data to make my hypothesis. It was important to keep a critical eye on the articles while reading them so I could determine which information was critical to mention in my thesis. Reading relevant papers and theories about the subject increased my comprehension of the topic. Something I will take with me for future research is to look at the citations of relevant papers. I will be exposed to way more relevant papers by looking at the references and citations instead of just googling the keywords.

The main new skill I developed during this thesis was my ability to create valid surveys and to discover and use many valuable features that Qualtrics has to offer. Beforehand I did not know about options such as randomization. This feature creates the opportunity to create one survey for multiple conditions. I also learned how to use the scoring function in Qualtrics which made the process of my data analysis more straightforward. The current study had 108 participants who were recruited via a combination of convenience sampling and snowball sampling methods. The recruitment was done using a post on Facebook and LinkedIn, asking family and friends personally and sending a request in multiple university group chats. Additionally, survey peer support Facebook groups and websites such as Surveyswap were utilized. These turned out to be the least effective, resulting in people not filling out the survey or making an agreement to fill out each other surveys and then not keeping their word. Twenty-one participants did not complete the survey. In the future, I will not utilize these Facebook Groups anymore. They turned out to be a waste of time and extremely labor-intensive. A better way to gather participants would be to ask friends and family to personally approach their friends and family to participate in my study.

For this thesis, it was also required for the students to write code. I used RStudio to write code for my data analysis. Statistics is something I have trouble with so I started by refreshing my knowledge by reading past lectures of Statistics I and Statistics II. I was still not sure about my approach when writing the first draft of my results section but after I received feedback from Eriko Fukuda I was more confident on what I should improve. I drastically changed my result section and removed all unnecessary information to keep it clear and concise. In the future, I would ask for help earlier with components I struggle with.

I met all the deadlines that were set for the proposal and the poster. I also finished writing my methods section and literature review on time, but I still felt that I was too short on time towards the end of the thesis. I have invested a lot of my time and efforts in this thesis and combining this thesis with the heavy workload of the other courses was a challenge. The data collection process was also very time-consuming. The fact that I had to deal with a week between the pretest and posttest experiment created a situation in which I had to adapt to not waste any time. To overcome this obstacle I already

started my results section before all the data was collected. When the posttest was finished by all the participants I redid the analysis with the final data.

Overall this thesis was a huge learning experience. I learned more about my strengths and qualities. I faced challenges and found ways to overcome them. I could express my creative side through the videos and create a product I have truly invested in.

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Appendix A: State self-esteem scale

1. I feel confident about my abilities.
2. I am worried about whether I am regarded as a success or failure.
3. I feel satisfied with the way my body looks right now.
4. I feel frustrated or rattled about my performance.
5. I feel that I am having trouble understanding things that I read.
6. I feel that others respect and admire me.
7. I am dissatisfied with my weight.
8. I feel self-conscious.
9. I feel as smart as others.
10. I feel displeased with myself.
11. I feel good about myself.
12. I am pleased with my appearance right now.
13. I am worried about what other people think of me.
14. I feel confident that I understand things.
15. I feel inferior to others at this moment.
16. I feel unattractive.
17. I feel concerned about the impression I am making.
18. I feel that I have less scholastic ability right now than others.
19. I feel like I'm not doing well.
20. I am worried about looking foolish.


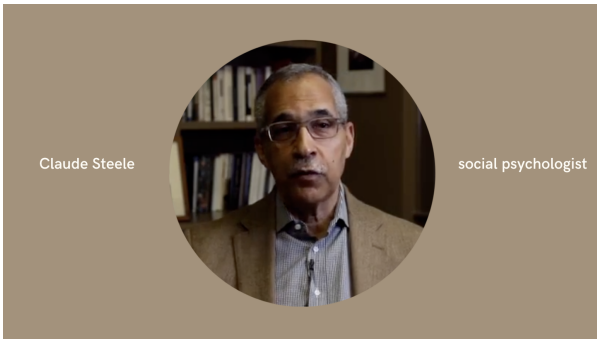
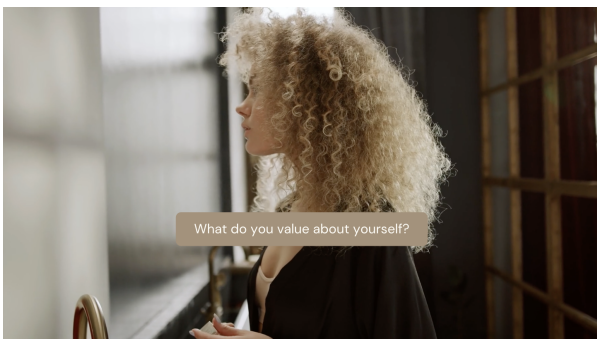
All items are answered using a 5-point scale (1 = not at all, 2 = a little bit, 3 = somewhat, 4 = very much, 5 = extremely; Heatherton & Polivy, 1991).

Appendix B: Trait Emotional Intelligence Questionnaire – Short Form

1. Expressing my emotions with words is not a problem for me.
2. I often find it difficult to see things from another person's viewpoint.
3. On the whole, I'm a highly motivated person.
4. I usually find it difficult to regulate my emotions.
5. I generally don't find life enjoyable.
6. I can deal effectively with people.
7. I tend to change my mind frequently.
8. Many times, I can't figure out what emotion I'm feeling.
9. I feel that I have a number of good qualities.
10. I often find it difficult to stand up for my rights.
11. I'm usually able to influence the way other people feel.
12. On the whole, I have a gloomy perspective on most things.
13. Those close to me often complain that I don't treat them right.
14. I often find it difficult to adjust my life according to the circumstances.
15. On the whole, I'm able to deal with stress.
16. I often find it difficult to show my affection to those close to me.
17. I'm normally able to "get into someone's shoes" and experience their emotions.
18. I normally find it difficult to keep myself motivated.
19. I'm usually able to find ways to control my emotions when I want to.
20. On the whole, I'm pleased with my life.
21. I would describe myself as a good negotiator.
22. I tend to get involved in things I later wish I could get out of.
23. I often pause and think about my feelings.
24. I believe I'm full of personal strengths.
25. I tend to "back down" even if I know I'm right.
26. I don't seem to have any power at all over other people's feelings.
27. I generally believe that things will work out fine in my life.
28. I find it difficult to bond well even with those close to me.
29. Generally, I'm able to adapt to new environments.
30. Others admire me for being relaxed.

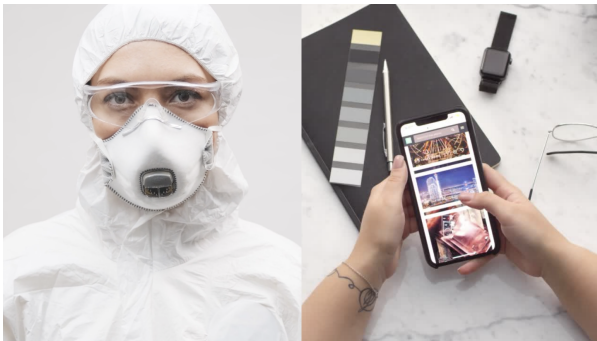
All items are answered using a 7-point scale (1 = completely disagree, 7 = completely agree; Cooper & Petrides, 2010).

Appendix C: Transcript educational video (experimental group)

Screenshot video	Text of the voice over
	<p>Let's talk about positive affirmations.</p>
<p>self-affirmation</p> <p><i>self-af-fir-ma-tion</i> \ ,self-,a-fər-'mā-shən ⓘ \</p> <p>The act of affirming one's own worthiness and value as an individual for beneficial effect (such as increasing one's own confidence or raising self-esteem)</p>	<p>Positive affirmations are the act of affirming one's worthiness and value as an individual for beneficial effects such as increasing one's confidence or raising self-esteem.</p>
	<p>The self-affirmation theory was first proposed by social psychologist Claude Steele.</p> <p>The self-affirmation theory was first proposed by social psychologist Claude Steele. In short, the theory entails that people respond to situations in a way that protects their sense of self by affirming their self-worth and image.</p>
	<p>Self-affirmations can be done by recalling aspects someone values about themselves or by stating positive statements. An example can be "I am loved".</p>



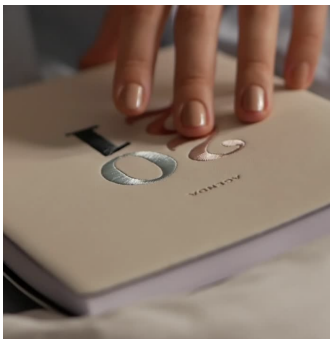
There are many benefits that come with positive affirmations. They motivate you, inspire you, and repeating them can change the way you think and behave, they can make you feel positive, energetic, and positively change your mindset.



Positive affirmations can especially be helpful now in this time of the pandemic. where feelings of loneliness and social media comparison, which causes low self-esteem, are very high.

How to make affirmations?

But how can you implement these positive affirmations in your own life and routine?



Avoid negative wording

Make a statement that resonate with you

Use present tense

Keep it brief and specific

First, you need to make your affirmations. A few things to keep in mind are to avoid negative wording. So instead of "I won't be ignored" say "I am worthy and my opinion matters". Another key factor is to Make sure your affirmation resonates with you as an individual. Use present tense instead of future. So instead of saying "I will become more intelligent" say "I am intelligent". And finally, keep your affirmations brief and specific. A tip to make it easier is to start your affirmations with "I am".

How to use positive affirmations?

Now that we know how to make an affirmation, how do we use them?

It's all about repetition. Try to repeat your affirmations a few times a day. It's best to start your day and end your day with affirmations. There are a few ways to remind yourself of them. Write your affirmations on a sticky note and put that on your mirror so you can see them if you do your hair or makeup.

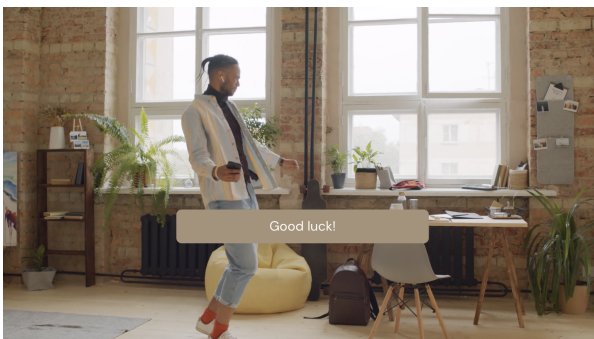


Make a picture of your quote and put it on the background of your phone so you are reminded every time you look at the time. If you meditate, use your affirmations in your meditation. Find a way that feels natural to you.

I am amazing

Let's try a few positive affirmations together! You can say it out loud or in your head.

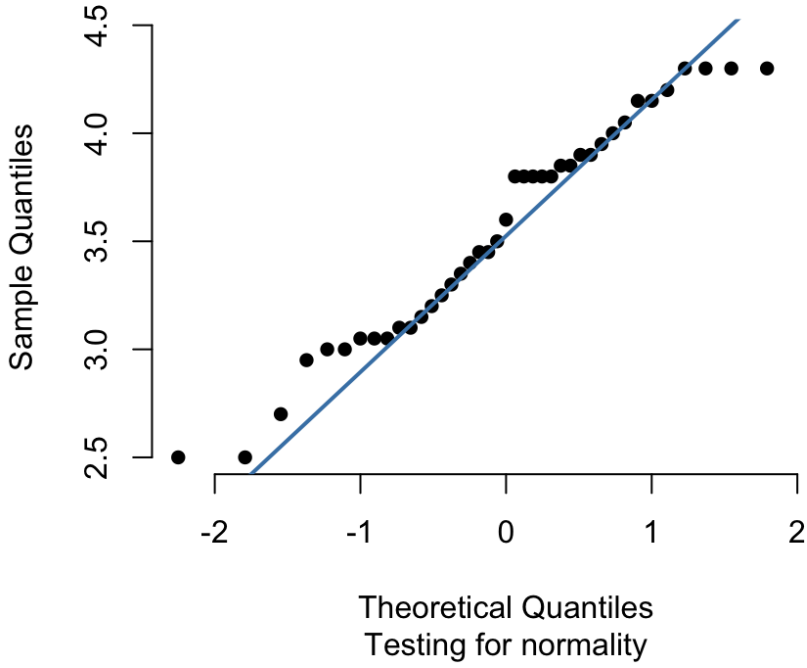
"I am amazing", "I am creating the life of my dreams", "I am already whole and complete".
Great job!



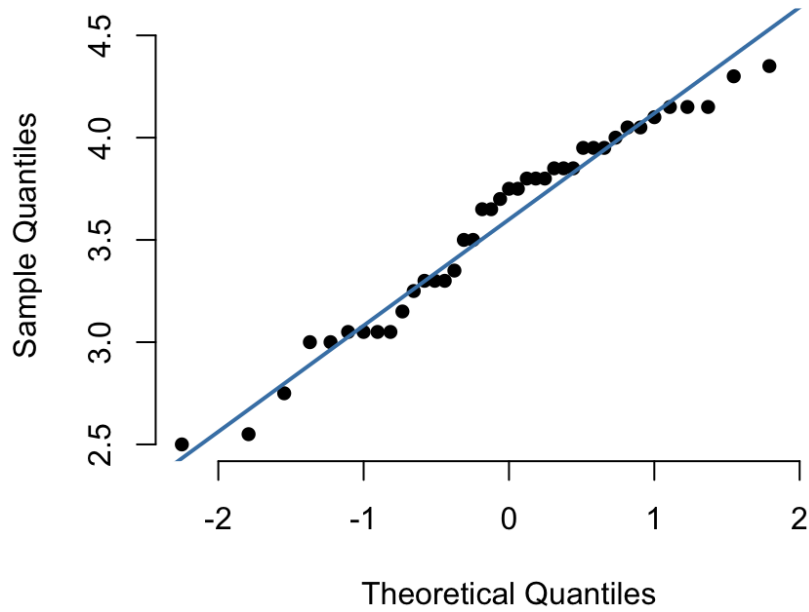
Try to implement this simple change in your routine. Add some self-love and positivity to each day. And see what difference it can make!
Have a beautiful day!

Appendix D: Q-Q plot self-esteem

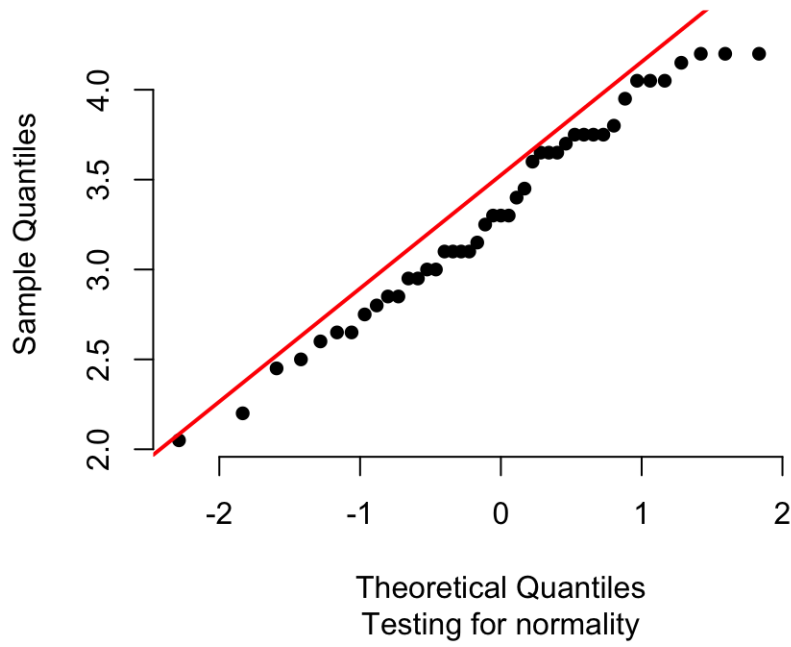
self-esteem pretest control group



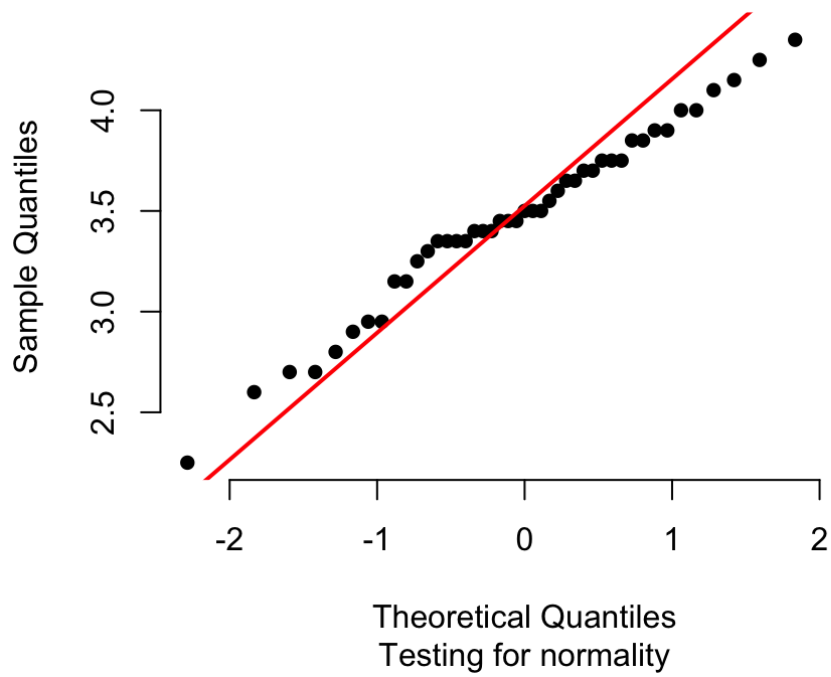
self-esteem posttest control group



self-esteem pretest experimental group

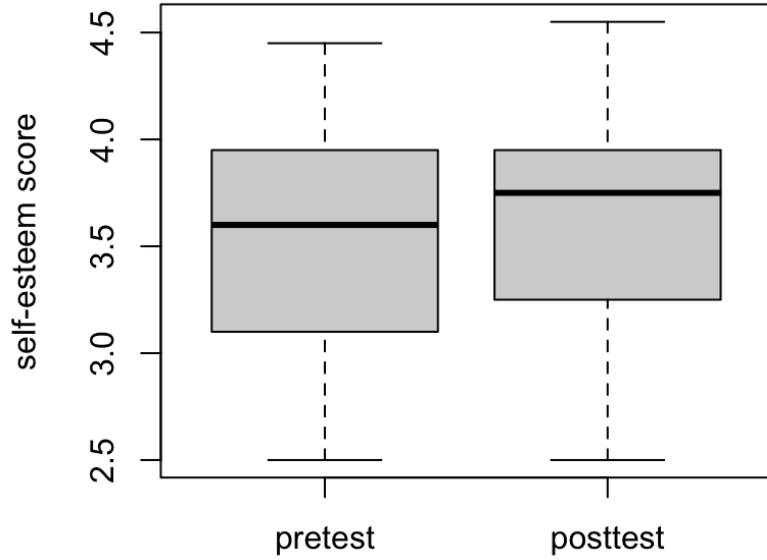


self-esteem posttest experimental group

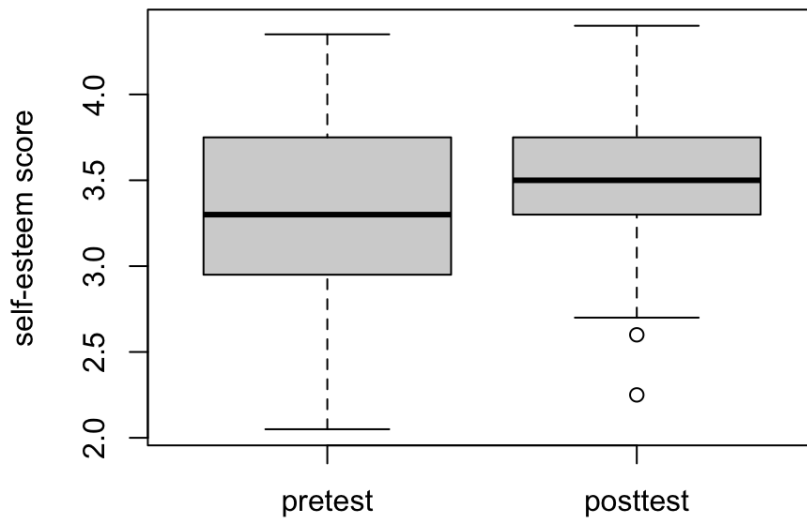


Appendix E: Boxplot self-esteem

Homogeneity of variance control group

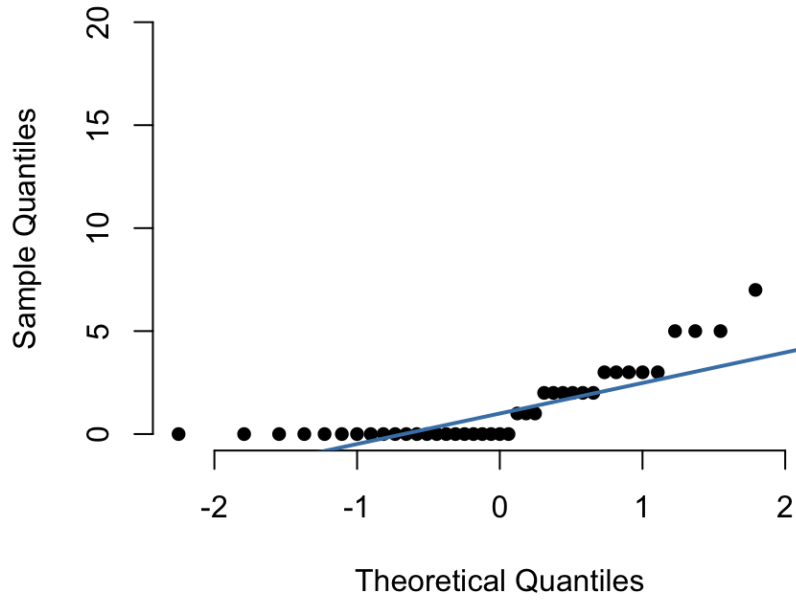


Homogeneity of variance experimental group

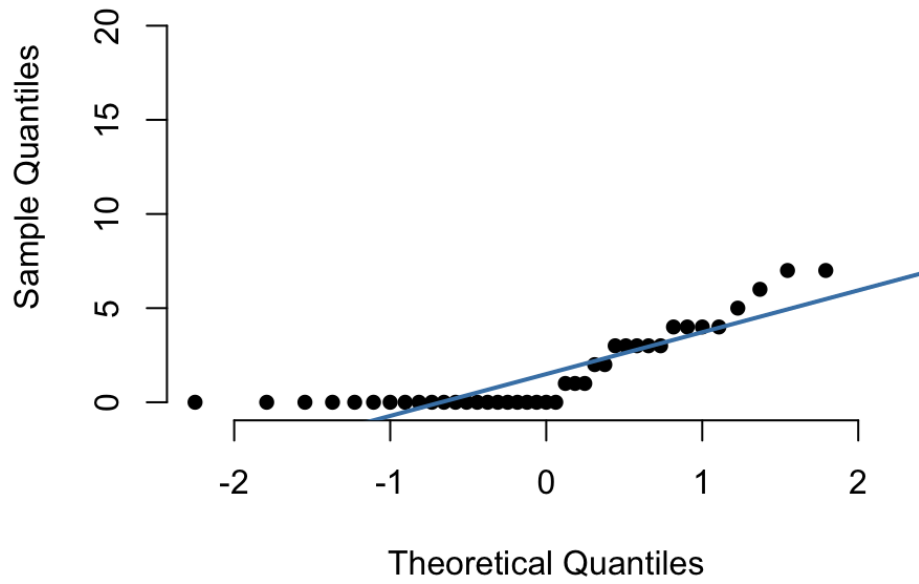


Appendix F: Q-Q plot use of affirmations

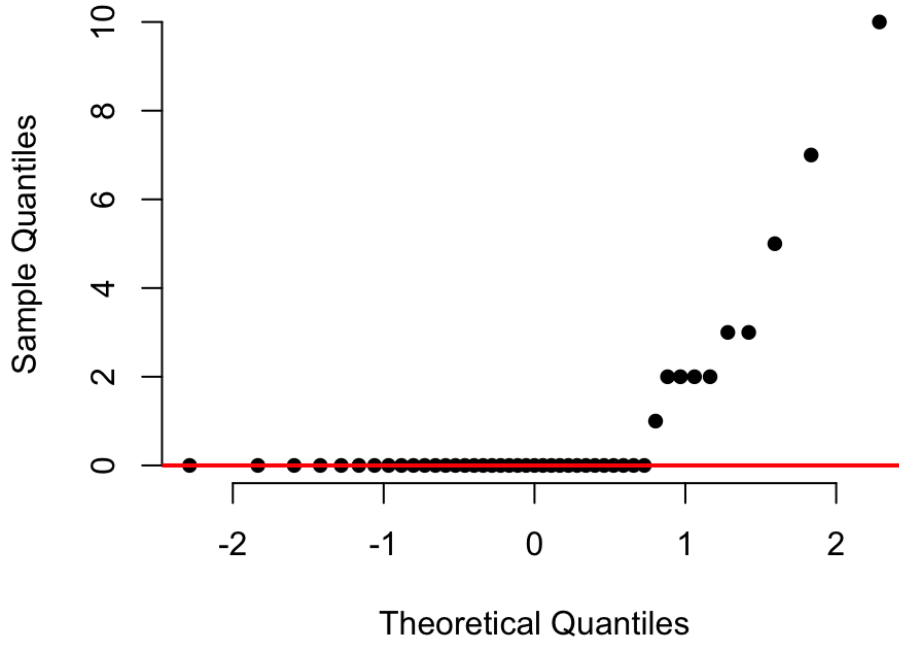
Affirmations pretest in control group



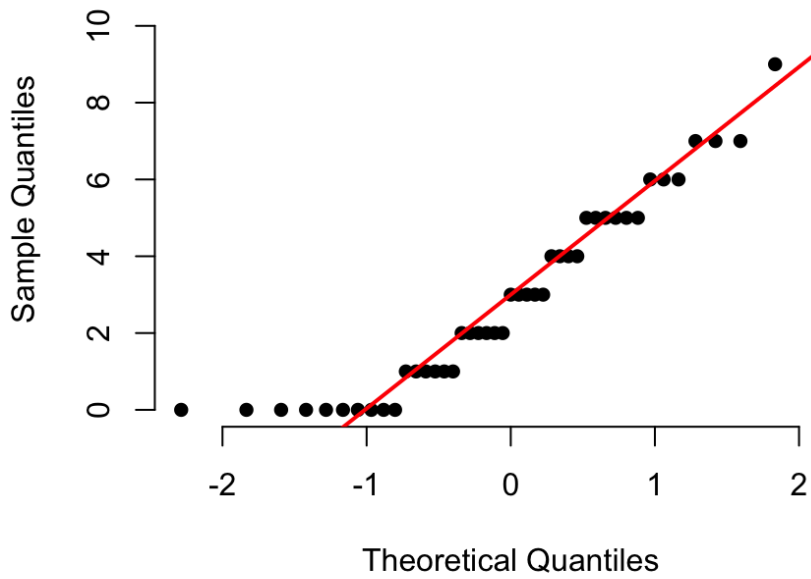
Affirmations posttest control group



Affirmations pretest in control group

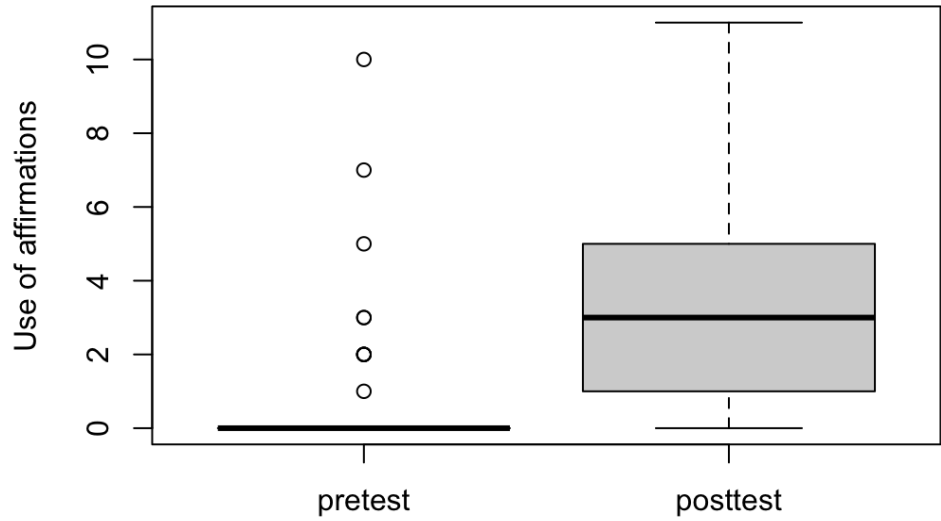


Affirmations posttest control group

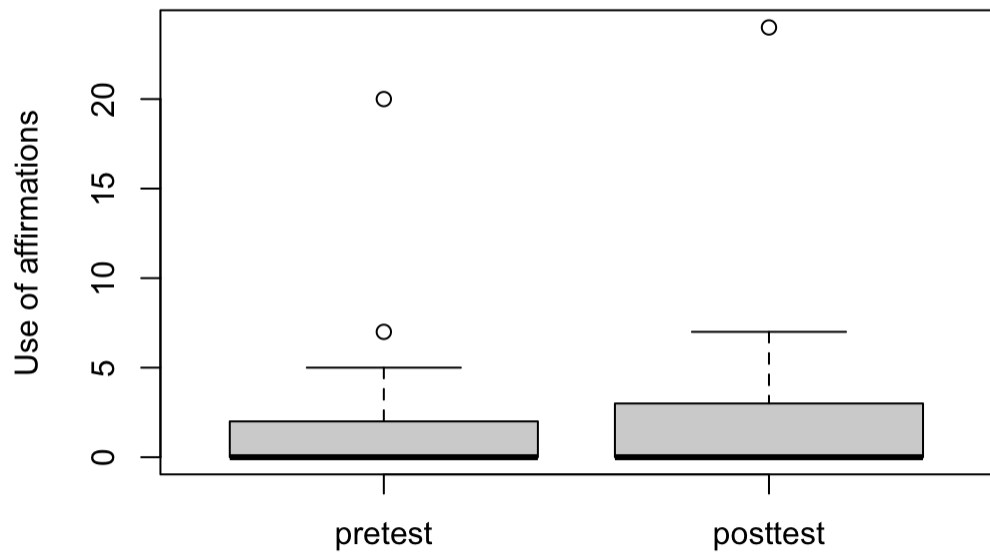


Appendix G: Boxplot use of affirmations

Homogeneity of variance experimental group affirmator

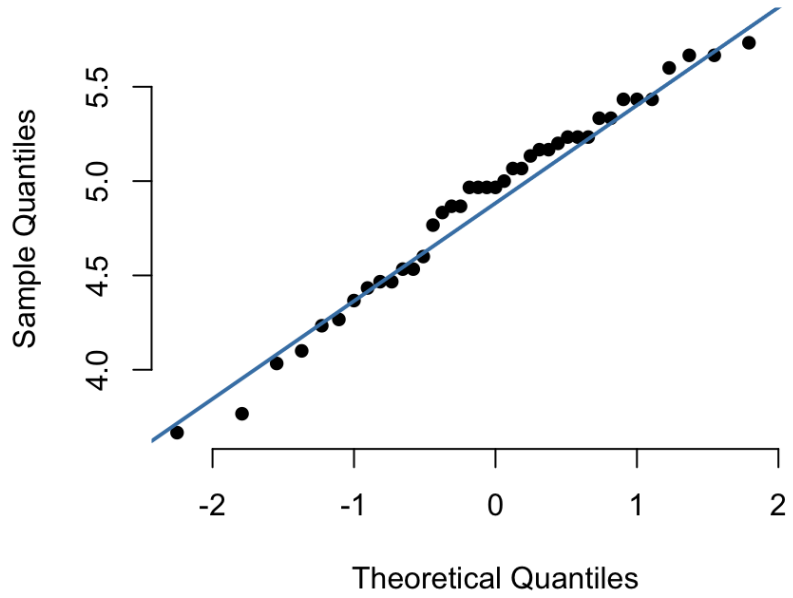


Homogeneity of variance control group affirmations

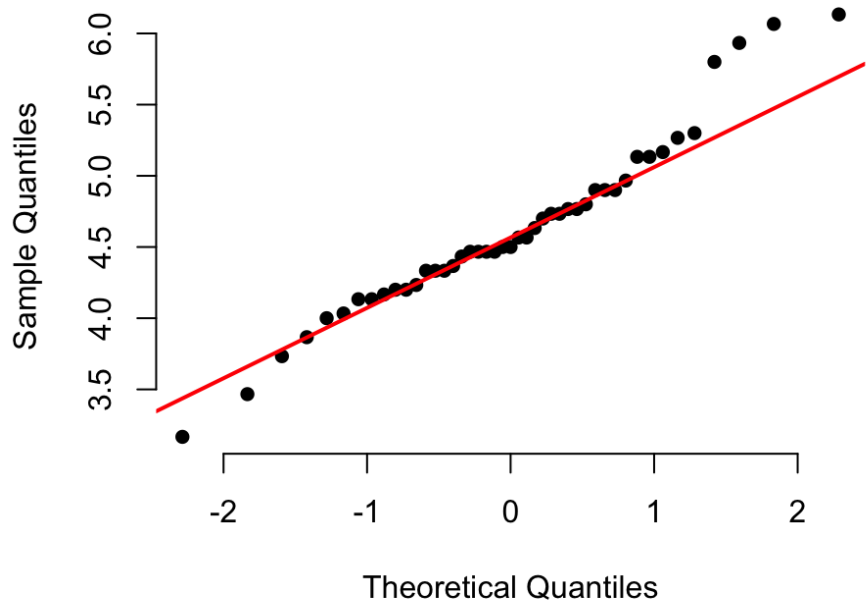


Appendix H: Q-Q plot TEIQue-SF

TEIQue-SF control group



TEIQue-SF experimental group



Homogeneity of variance both conditions

