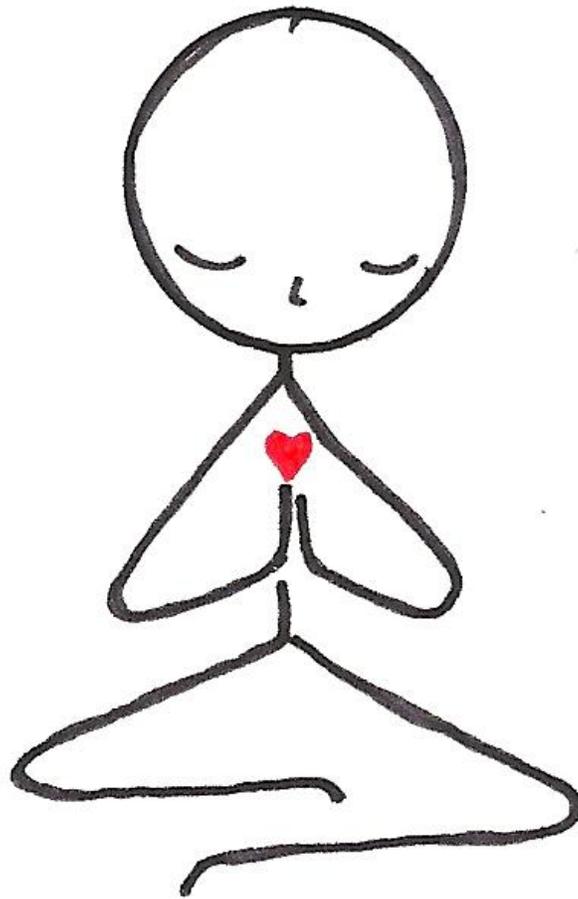


Master thesis

A study into the foundation of Compassion Focused Therapy

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18 April 2017



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Abstract

Aims: The goal of this study was to test for the theory of Gilbert (2009) about the three emotion regulation systems (threat, drive and contentment) and the influence of compassion on the balance of the three emotion regulation systems, which is the foundation for Compassion Focused Therapy (CFT). The aim consisted of three parts: What is the ratio of activation of the emotion regulation systems in daily life within people? Do self-compassionate individuals experience higher frequency of activation in the contentment system? Do people high in self-compassion have a more activated contentment system, because self-compassion reduces the experience of daily stressors, that in turn might influence the activation of emotion regulation systems?

Methods: Data was collected using the experience sampling method, of 43 psychology students from the University of Twente. The activation of the emotion regulation systems was determined via the emotion quadrant, in which emotions were classified on the level of arousal and the positive-negative dimension. An ANOVA was done to measure the relation between self-compassion and the activation of the contentment system.

Results: The results showed that the contentment system was clearly under activated, which supports part of Gilbert's theory that most people have an over activated threat and/or drive system (Drive: 39,3%, threat: 48,3%, contentment: 12,4%). However, there was no relation found between the level of self-compassion and the experience of low arousal positive emotions ($p=.296$). Also, daily hassles did not prove to mediate the relation between self-compassion and the activation of the contentment system in terms of experienced low-arousal positive emotions. Therefore, it can be concluded that there was no supporting evidence found in this study for the propositions regarding the relation of compassion to the activation of the contentment system in relation to the threat and drive systems in daily life as proposed within the theory of Gilbert (2009). Nevertheless, there were some methodological limitations, including the emotions quadrant as a new way of measuring emotions. Also, other researchers did find some supporting evidence for the theory in earlier studies, and experimental results of CFT showed promising results. Therefore, further research on the emotion quadrant and the theory of Gilbert (2009) is recommended.

Introduction

One day can be seen as a sum of situations. A person's emotional state fluctuates throughout the day, influenced by the situation and how it is perceived and coped with. For many years, researchers have been interested in factors that promote coping and subjective well-being (Leary, Tate, Adams, Allen, & Hancock, 2007). Many people aggravate unpleasant situations by ruminating excessively about life's hassles, criticizing themselves for their shortcomings and fixating on their own problems. Research suggests that using self-compassion, a person may deal with life's hassles more positively (Leary, et al. 2007)(Neff, 2003a,b). Being self-compassionate is associated with patterns of thoughts that generally facilitate people to better cope with negative events and with the experience of lower negative emotions (Leary et al, 2007). Also, among students it seems that self-compassion could buffer against negative emotions when experiencing unpleasant life events. The study by Neff, Hsieh and Dejitterat (2004) suggests that self-compassion helps facilitate the learning process by freeing individuals from debilitating consequences of harsh criticism, isolation, and over identification in the face of failure, and instead provides them with self-kindness, a sense of common humanity, and emotional balance. Thus, the way a situation is coped with is important for a person's emotional state of being. Coping in a self-compassionate way seems to be associated with a more positive emotional state of being.

Self-compassion

In recent years, the concept of compassion from the Buddhist practices has come under the attention of Western scientists, because of its potential positive mental health benefits (Gilbert, McEwan, Matos, Rivis, 2011)(Sprecher, Fehr, 2005)(Hofman, Grosman, Hinton, 2011)(Leary et al.2007). As a result of this compassion has become an extensively researched and empirically tested construct (MacBeth & Gumley, 2012) (Neff K. , 2003a,b) (Gilbert, et al., 2012). Gilbert (2009) defines compassion on an operational level, as an evolved motivational system that involves skills, such as feeling, attention and behavior, and attributes, such as care for well-being, non-judgement and empathy. By training these skills and attributes, it is argued, negative psychological symptoms can be alleviated, which is currently one of the objectives of Compassion Focused Therapy (Gilbert, 2009).

Within this construct of compassion, there is a three-way interaction in the construct of compassion, namely compassion towards others, compassion from others and compassion towards oneself. In particular, *self*-compassion has been proven to be a predictor of a positive mental health and therefore many researchers have focused on this part of the concept of compassion the most (Terry & Leary, 2011)(Allen & Leary, 2010)(Leary et al., 2007)(Neff, Rude, & Kirkpatrick, 2007)(Neff, 2011). According to Neff (2003a), one of the leaders in the study of self-compassion, self-compassion involves “being open to and moved by one’s own suffering, experiencing feelings of caring and kindness toward oneself, taking an understanding, nonjudgmental attitude toward one’s inadequacies and failures, and recognizing that one’s experience is part of the common human experience” (p. 224). There are three interrelated components to self-compassion that are exhibited during times of pain and failure, namely self-kindness, common humanity and mindfulness. Self-kindness means being kind and understanding toward oneself in instances of pain or failure rather than being harshly self-critical. Common humanity means perceiving one’s experience as part of the larger human experience rather than seeing them as separating and isolating. Lastly, mindfulness means holding painful thoughts and feelings in balanced awareness rather than over-identifying with them. In other words, it means being in the here and now whilst acknowledging all that is happening around us(Neff, 2003a).

Since all three components are interrelated, it is argued that self-compassion as a whole is a healthy coping mechanism for stressful situations, such as perceived inadequacy, failure, or general suffering (Barnard & Curry, 2011). People with more self-compassion in general have less self-criticism, depression symptoms, anxiety, rumination, thought suppression, neurotic perfectionism, and experience more life satisfaction and social connectedness (Neff et al., 2007). Reasons for this include that self-compassion evokes kindness, equanimity in relation to others, and feelings of interconnectedness. This helps individuals find hope and meaning whilst being affected with the difficulties of daily life (Neff, Rude, & Kirkpatrick, 2007) .

To measure the construct of self-compassion, the majority of research has used the Self-Compassion Scale developed by Neff (2003a). It measures the level of self-compassion of a person as a fixed trait that is relatively stable over time. Although lately, the SCS has received criticism on not entirely measuring the construct of compassion, but counterparts of characteristics that are already known to be related to psychopathology (Murriss & Petrocchi,

2016). In general it is an accepted way of measuring the concept of self-compassion and its psychometric properties and validity have been empirically tested (Barnard et al., 2011)(Neff, Whittaker, & Karl, 2017).

When a person responds compassionately in a social situation, he or she evokes more positive emotions and perceives the situation as less stressful (Neff et al., 2007). Therefore, it is suggested that when compassion is trained it may work as a buffer in developing negative psychological symptoms (Gilbert, 2009)

Emotion regulation systems

As mentioned above, situations and thoughts influence our emotional state of being and people with more self-compassion tend to have a more positive emotional state. According to the theory of Gilbert (2009) our emotional state of being is managed by three emotion regulation systems. These are the threat system, drive system, and contentment system. Depending on the situation and the thoughts of a person, one of the systems is activated. Each of the three systems is associated with a different area in the brain and different brain chemistry. In Figure 1. the relation between the three emotion regulation systems is shown.

When a person thinks in a compassionate way the contentment system is activated. The purpose of this system is to manage distress and promote bonding. In this case the prefrontal cortex is active, because the person is thinking in a compassionate way. Also the parasympathetic nervous system is activated, which releases hormones to sooth the body. The hormones involved in this system are believed to be opiates and oxytocin (Rockliff et al., 2008; (Morrone-Strupinsky & Depue, 2004). Feelings associated with this emotional state of being are safeness, contentment and compassion. Thus, thinking compassionately activates the contentment system and puts the body and the mind into a content and calm state of being(Gilbert, 2009).

On the other hand, when a person perceives a situation as stressful and thinks negative or critical thoughts the threat system is being activated. The person feels threatened and the most primal system will be activated. This system is important for our survival and is therefore easily triggered. This system detects whether there is a threat and responds with a range of negative emotions such as fear, anger, or disgust. These emotions urge the initial response to protect itself

and seek safety, through a fight, flight or freeze response. The system responds to different types of threats or ‘stressors’ (Gilbert, 2009).

Thirdly, a person’s drive system is activated whenever there is an incentive to take action. This is an emotional and motivational system that directs us towards a reward or resource. Common actions include seeking food, shelter and a partner to reproduce. An activated drive system causes high arousal positive feelings such as excitement, happiness, and amusement, and gives us energy to attain certain desires and life goals (Gilbert, 2009). Both the drive system and the threat system activate the sympathetic nervous system to prepare a person for action. Although on a neurological basis the two are directed by different hormones (the drive system via dopamine and threat system via serotonin), they both put the body in a state of arousal (Morrone-Strupinsky et al., 2004).

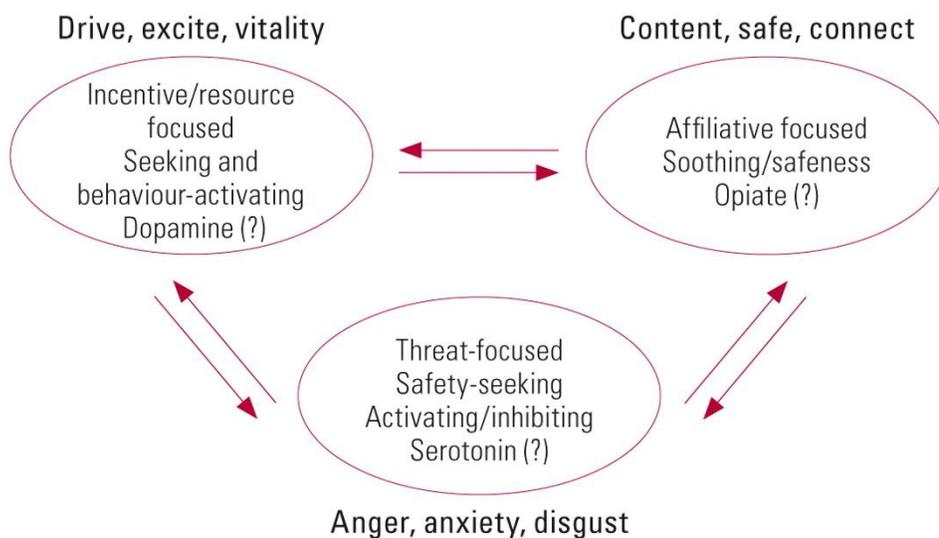


FIG 1 Affect regulation systems. From Gilbert (2005a), with permission of Routledge.

Figure 1: Emotion regulation systems. From Gilbert (2009)

According to Gilbert (2009), the processes described are oversimplifications of complex processes. Nevertheless, the foundation of Compassion Focused Therapy (CFT) is that many people have an imbalanced emotion regulation system, because their contentment system is underdeveloped and/or their threat and drive system is overactive. This imbalance between the systems supposedly causes a lot of distress in a person. Gilbert (2009) argues it is beneficial for a

person to have a more developed contentment system, so that the three systems are more in balance. This developed contentment system can be achieved through compassion and ultimately results in better psychological well-being (Gilbert, 2009).

While CFT has been experimentally shown to be an effective therapy for among others mood disorders, eating disorder, psychosis and personality disorders (Leaviss, & Uttley, 2014; Gale, Gilbert, Read, & Goss, 2012; Braehler, Gumley, Harper, Wallace, Norrie, & Gilbert, 2012; Lucre & Corten, 2012). The theoretical basis is not yet well supported by empirical evidence. The assumption by Gilbert (2009) that a more developed contentment system leads to a better balance between the three emotion regulation systems has been investigated by Morrone-Strupinsky and Depue (2004), who managed to give empirical evidence for this on a physiological level of the contentment system. On an emotional level, however, the working of the three systems and the optimal balance between them is not entirely clear yet. The other main assumption Gilbert (2009) makes is that a higher level of compassion leads to a more developed contentment system, which automatically results in a better balance between the three systems. This study aims to investigate this important assumption empirically. In order to measure the activation of the contentment system, it is operationalized as the experience of low arousal-positive emotions. This will be further explained in the next paragraph.

Operationalization of emotions

Both the drive system and the contentment system are associated with positive emotions (Gilbert, 2009), even though they are associated with different emotion regulation systems. The drive system is associated with emotions that put the body into a state of arousal, such as joy and interest, while the contentment system is associated with emotions that have a calming effect on the body and sooth the body, such as contentment, safeness and serenity. In order to infer whether someone's drive or contentment system is activated by means of measuring emotions, a more fine-grained classification of emotions is necessary. For the purpose of this study the level of arousal as a second dimension will be added (Figure 2). When a person experiences low arousal positive emotions, this is associated with the activation of the contentment system. When a person experiences high arousal-positive emotions this is associated with the activation of the drive system. This two dimensional division of emotions, enables a more detailed classification

of emotions and therefore can determine the activation of the different emotion regulation systems.

Before, emotions have mostly been measured via self-report measures, such as the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988), and the Modified Differential Emotions Scale (MDES, Galanakis, Stalikas, Pezirkianidis, & Karakassidou, 2016). Both questionnaires consist of scale questions about the presence of several emotions, although, the MDES includes a wider range of emotion-like states, such as surprise and other less prototypical emotions. When questioning a wide range of emotions it is difficult to determine the overall emotional state of being on a certain point in time. Therefore this study has developed an emotions quadrant to measure how a person is feeling at a certain point in time, thereby determining which emotion regulation system is activated. Other researchers (Yik, Russell and Steiger, 2011) have introduced a similar measure in the study of core affect. They introduced a 12 point affect circumplex for core affect, because of its greater precision and assessment possibilities and it showed promising results. The emotions quadrant, as shown in Figure 2. is a relatively new way of measuring emotions and will be further explored in the methodology section.

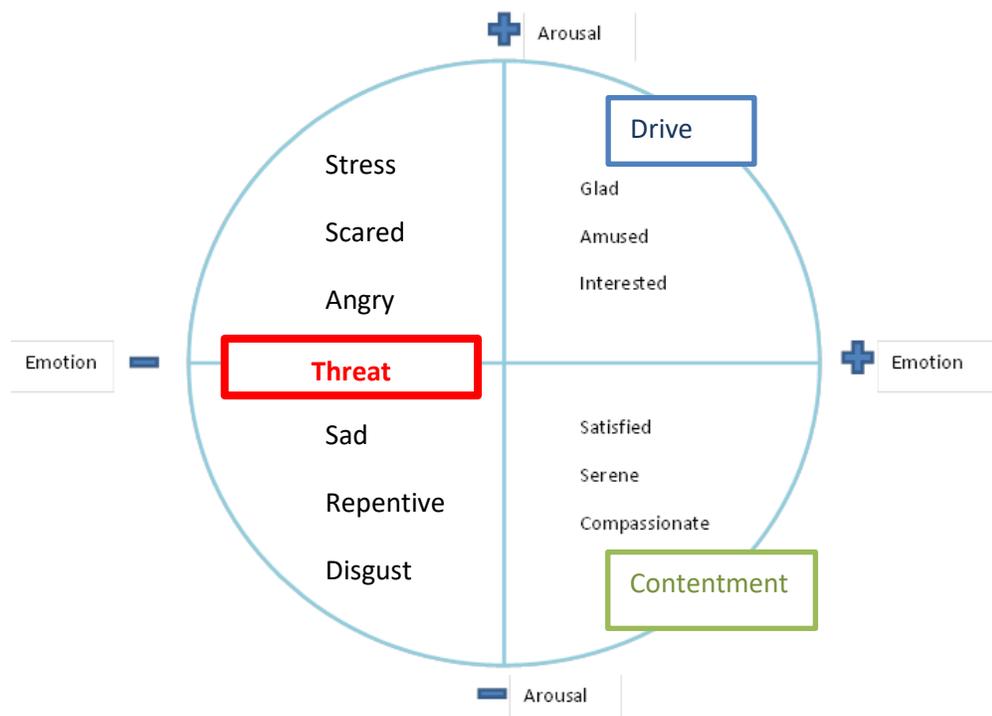


Figure 2: Two dimensional division of emotions

Experience sampling method

In order to understand the pattern of activation of the three emotion regulation systems, data must be collected for one person over a period of time. Therefore, in this study the experience sampling method is used, because research suggests that this method is the optimal way to study a person's emotional state of being. According to Csikszentmihalyi and Hunter (2003) the experience sampling method was developed to determine variations in emotional state over time. The method relies on subjects' responses to an electronic pager that signals at random times during the day, thereby collecting up to 49 measurements of each participant at specific moments in time during an average week (Csikszentmihalyi et al., 2003). This gives the opportunity to obtain data about a person's emotional state as the situation occurs, which minimizes the effects of reliance on memory and reconstruction (Larson & Csikszentmihalyi, 2014). Several studies show that using retrospective self-report measures results in exaggeration of the symptoms. It seems that the length of the recall interval determines the amount of distortion (Ebner-Priemer, U.W., & Trull, T.J., 2009). Also, in contrast to self-report measures, this method improves generalizability of the findings, because the emotional state is measured in the context of a person's everyday life (Ebner-Priemer et al., 2009). Moreover, it gives the opportunity to measure the shift in emotional state within a participant. Within the experience sampling method, a variable of interest can be assessed repeatedly over time, resulting in time series that enable researchers to investigate variability of experience and within person processes (Ebner-Priemer et al., 2009). There have been other ESM studies on the emotional state of a person (e.g. Csikszentmihalyi et al., 2003), but the emotions quadrant is a new psychometric measure that is developed for this study in particular.

Aim of this study

The aim of this study was to test the theory of Gilbert (2009) about the emotion regulation systems on an emotional level. The activation of the emotion regulation systems was operationalized via the emotions quadrant and the interrelation of the three emotion regulation systems was examined. As explained above, research suggests that compassion is related to the activation of the contentment system and thereby having a healthier balance between the three emotion regulation systems. This will be investigated on an individual level as well as on a group

level, in which the contentment system will be operationalized as the experience of low-arousal positive emotions.

Not only compassion could have an effect on the activation of the contentment system. Another factor that influences the activation are daily hassles, whereby more daily hassles could lead to less activation in the contentment system and more activation in the threat or drive system. As mentioned in the introduction, research suggests that by using self-compassion a person may deal with life's hassles more positively (Leary, et al. 2007)(Neff, 2003a,b). Being self-compassionate is associated with patterns of thoughts that generally facilitate people to better cope with negative events and with the experience of lower negative emotions (Leary et al, 2007). Also, among students it seems that self-compassion could buffer against negative emotions when experiencing unpleasant life events (Neff, Hsieh and Dejitterat (2004). Thus, it seems that having a high level of self-compassion could work as a buffer for these stressors and thereby leave the contentment system of a person activated. Therefore, daily hassles were added as an extra variable to this relationship, in order to create a broader understanding of this relationship and the theory of Gilbert. It was predicted that daily hassles could have a mediating effect on the relationship between self-compassion and the activation of the contentment system.

This study aimed to investigate the following three questions.

Question 1: What is the ratio of activation of the emotion regulation systems in daily life within people?

Question 2: Do self-compassionate individuals experience higher frequency of activation in the contentment system?

Question 3: Do people high in self-compassion have a more activated contentment system, because self-compassion reduces the experience of daily stressors, that in turn might influence the activation of emotion regulation systems?

Methods

Participants

The study sample consisted of 43 psychology students from the University of Twente, of which 79% was female and 21% male. The mean age was 20.71 years (range 18- 25 years). Only participants who were 18 years or older and studied psychology at the Faculty of Behavioral, Management and Social Sciences at the University of Twente were included. Students who recently had gone through a major life event (e.g. death of a relative or illness) or who suffered from psychopathology (e.g. depression or anxiety) were excluded from this study. Another important inclusion criterion for this study was the motivation for participation in the study. Only when the participant showed clear commitment to the study and thought of specific strategies to comply with the conditions, was the participant included in the study. Participation was voluntary and the privacy of the participants was assured. Written informed consent and ethical approval was obtained from all participants.

Procedure

The participants were recruited through flyers and advertisements on the campus of the University of Twente. Before the start of the experience sampling study, participants were gathered at a *kick-off meeting* for a briefing on the study, where they received a letter with information about the study and installed a mobile app UT Survey (Borgonjen, F., 2015). A couple of days before the sampling week, the participants were asked to complete a pre-test, an online questionnaire including the SCS-SF. Via the mobile app, the participants were monitored for one week. At seven random times during the day they were signaled and asked to complete a self-report, including the question on the emotion quadrant, the presence of stressors in the past 2 hours and several other experiences occurring at that moment. They completed the self-report questionnaire in the app and the data was collected directly after the participant completed the questions. During the week the questionnaires were sent 7 times a day, totaling 49 measurements. After completion of the study and if the participant showed sufficient commitment, the participant received a reward of 40 euro in gift cards for their participation in the study. If the response rate was insufficient (< 80%), the participant did not receive monetary reward. Although this was not necessary, since all the response rates were sufficient. There was

one participant who didn't fill out the pre-test, this participant did conclude the ESM, however these results were not included in the dataset for analysis.

Measurement Instruments

The data for this study was acquired in a larger study on self-compassion and stress in the spring of 2015 and 2016. Of all the measures of the larger study, only those that are relevant for this study will be explained.

Pre-test

Self-compassion

The pre-test consisted of the Dutch version of the Self-Compassion Scale-Short Form (SCS-SF; Raes, Neff, & van Gucht, 2011)(Neff & Vonk, 2009). This scale (scale 1-7, 1 = zelden of nooit, 7 = bijna altijd) contains twelve items (e.g., “Als ik een moeilijke tijd meemaak, geef ik mezelf de zorg die ik nodig heb”) and assesses six different aspects of self-compassion. Self-Kindness, Common Humanity, and Mindfulness referred to attributes of self-compassion and Self-Judgement, Isolation and Over Identification referred to the counterparts of the self-compassion concept. The short scale had a near perfect correlation with the long scale when examining total scores of other studies (Raes et al., 2011). The scale also has also demonstrated concurrent validity (e.g., correlates with therapist ratings), discriminate validity (e.g., no correlation with social desirability), and test-retest reliability ($\alpha=.93$; Neff et al., 2009). Therefore, this questionnaire was used to measure construct of self-compassion. Although, there has been some criticism on the total score of the Self-Compassion Scale (Muris, & Petrocchi., 2016), latest research by Neff, Whittaker, & Karl (2017) shows that a total SCS score can be used as an overall measure of self-compassion. Therefore, for this variable the total score on the SCS-SF was calculated.

Experience Sampling Method (ESM)

Instead of the beepers that are most frequently used in ESM studies, for this study the UT Survey app (Borgonjen, F., 2015) was developed to monitor the students' emotional state throughout the day. The benefit is that the questionnaires could be completed directly in the app

and could be sent to the processor available to analyze. A drawback is that the mobile app needs an Internet connection in order to work, therefore students need an Internet connection on their phone, which is accompanied with some costs. The app was available in the app store and was compatible for several operating systems. There were a few mobile phones available to lend, if participants didn't have a mobile phone of their own. Only one participant needed to lend a mobile phone. The variables emotions and daily hassles were measured with ESM.

Emotions

For the assignment with the emotion quadrant, participants had to place a coordinate on the emotions quadrant that corresponded with the way they felt at that moment in time (See appendix A for an example). The emotion quadrant is a new form of measuring and was introduced in the literature review (Figure 1., developed during UTSurvey design, based on Yik, Russel & Steiger, 2011). The place of the coordinate determined in which emotion regulation system the participant was at that moment. The operationalization of the emotion quadrant was as follows; If the coordinate was placed between the axes low arousal and positive emotions, this participant experienced low arousal-positive emotions and therefore was categorized as being in the contentment system. If the coordinate was placed between the axes high arousal positive emotions, this coordinate fell into the category of high arousal-positive emotions and is labeled as the drive system being activated. Lastly, any coordinate place on the negative axis was categorized as negative emotions, which was theorized to indicate an activated threat system (Figure 1.). The sum was taken for the amount of times a person scored in each the categories over all the measure points. This led to three aggregated variables for the three total scores of the different categories, namely high arousal-positive emotions, low arousal-positive emotions and negative emotions. Lastly, percentages were calculated from these total scores.

Another possible variable, that was explored for the measure of the emotion regulation systems, was based on the experience of a wide range of emotions taken from the MDES (Galanakis, Stalikas, Pezirkianidis, & Karakasidou, 2016). However, this clustering of the emotions into categories of the emotion regulation systems was tested negative for reliability. Therefore, only the measure of the emotion quadrant was used as a dependent variable for this study.

Daily hassles

In order to measure whether a daily hassle was present or not in the past 2 hours, the following question was asked: ‘What was the most stressful event in the past two hours? Leave blank if no stress was experienced’. If a participant experienced a hassle over the past two hours, it was coded as yes. If the participant did not experience a hassle it was coded as no. The sum was taken from the amount of times a participant experienced a daily hassle, resulting in one aggregated total score of the amount of hassles over the 49 measurements.

Statistical analysis

The data analysis was done in IBM SPSS Statistics 23. For this research only univariate statistical analysis were used. For the ease of use, all variables were aggregated to one score representing one participant.

The data was explored for outliers using descriptive statistics, however the outliers were not excluded from the data, since the outliers were not obviously due to incorrectly entered or measured data and they did not change the results or assumptions.

Firstly, the emotion variable was further explored, using the percentages of each category of the emotion regulation systems. A paired sampled T-Test was done in order to test whether the difference between the three categories was significant. The paired sample T-Test hypothesizes that the difference between the three categories is zero. This hypothesis is rejected when the difference in the activation of the three emotion regulation systems is significant.

Secondly, to explore the relationship between self-compassion and the activation of the contentment system, the data was first explored within two randomly chosen participants, one participant high in self-compassion and one participant low in self-compassion. This was primarily done by plotting the activation of the three emotion regulation systems using SPSS, to explore the activation of the three emotion regulation systems over the course of the week for the two participants. In order to test the relationship on group level an ANOVA was performed between the total score on self-compassion and the percentage of time spent in the low arousal positive- emotions category.

Lastly, on individual level the pattern of activation of the three emotion regulation systems was compared to the experience of daily hassles. Moreover, the mediating effect of daily hassles on the relationship between self-compassion and low arousal-positive emotions was

tested using the method of Baron & Kenny (1986). This method first calculates the correlations of each single relationship. If all the single correlations are significant an ANOVA is done to check for a mediating effect. Correlations were calculated between the total self-compassion score, the percentage of the low arousal positive- emotions category reported and the sum of daily hassles that occurred using the Pearson Correlation Coefficient. If necessary, three ANOVA's will be performed with the variables.

Results

Exploring the average emotional state of the participants

Every participant has an overall percentage of time the three categories of emotional state were activated. When looking at the time all participants spend on average over the course of the week in the three emotional states (Table 1), it is shown that most of the time was spend in the drive and threat system. Meaning participants mostly experienced a high level of arousal, with both positive and negative emotions.

Table 1. Average percentages of time spend in each of the emotion regulation systems for all participants

Emotional state	Time present
High arousal - positive emotions	39,3% (Range = 56,2)
Low arousal - positive emotions	12,4 % (Range = 40,9)
Negative emotions	48,3 % (Range = 58,7)

For the average participant, it means that almost half of the time the threat system is activated. Only 12 percent of the time a person has an activated contentment system. The other 40 percent of the time the person's drive system was activated.

The results from the paired sample t-test show that the large difference in activation between the three emotional states (Table 2.) is significant for two of the three relations. There is a significant difference in a between the low arousal-positive emotions and negative emotions,

meaning that the threat system was significantly more activated than the contentment system. Moreover, there is a significant difference in activation between high arousal-positive emotions.

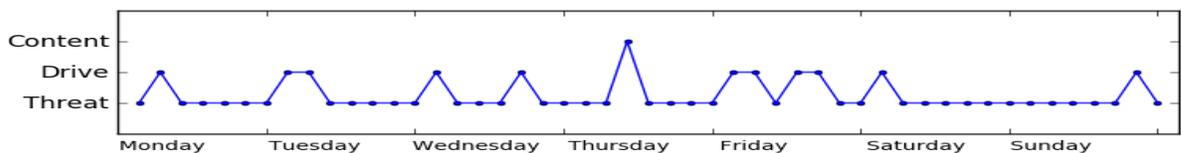
Table 2. Paired Samples T-test correlations

Paired samples	Correlations	Significance
High arousal-positive emotions - Low arousal-positive emotions	-.236	.132
High arousal positive emotions – Negative emotions	-.723	.000
Low arousal-positive emotions – Negative emotions	-.500	.001

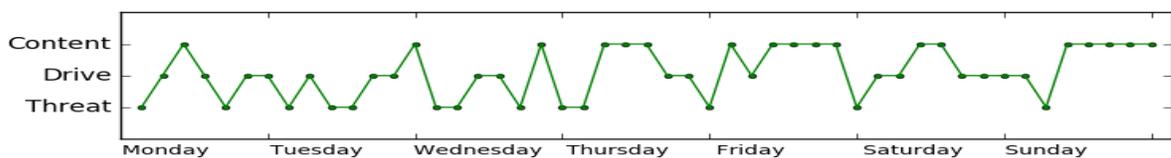
Comparing the level of Self-compassion to the activation of the contentment system

Individual level

For exploratory purposes, the fluctuations in activation of the emotion regulation systems during the measuring week are shown in figure 1 for two participants. For this within subject exploration a participant with high self-compassion and one with low self-compassion was randomly chosen.



A) Participant low in self-compassion, N = 49 (SCS = 2.58)



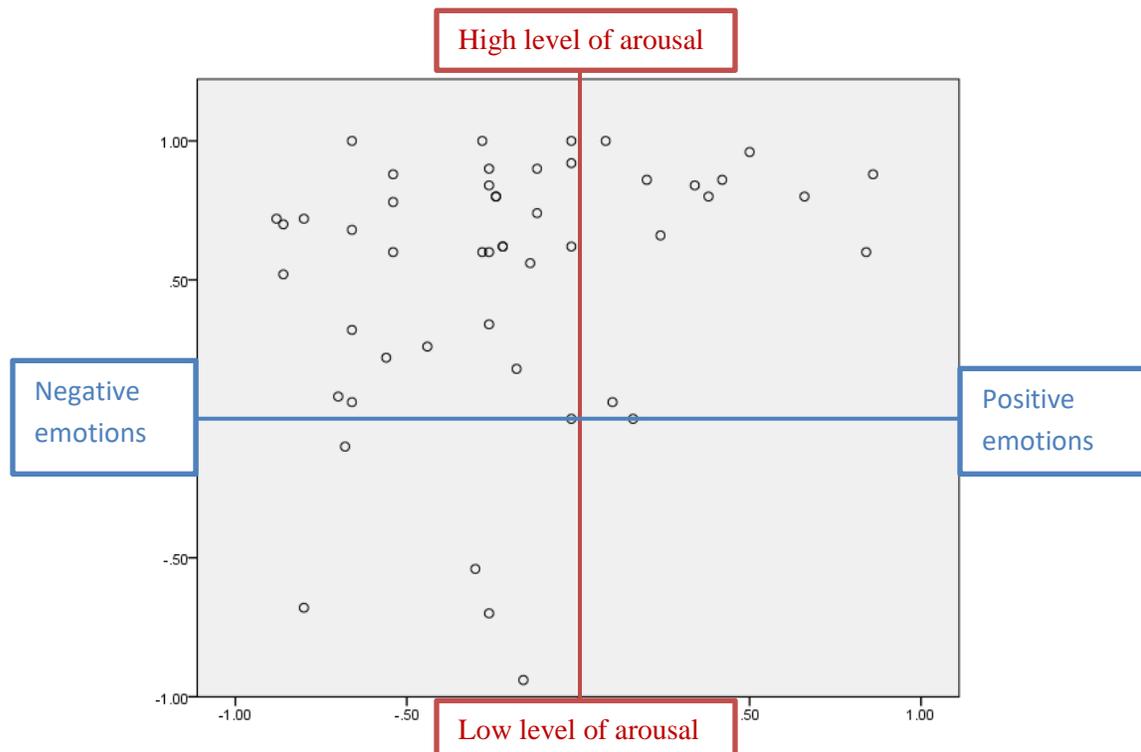
B) Participant high in self-compassion, n = 49 (SCS = 5.42)

Figure 1. Pattern of activation of the emotion regulation systems over the course of the week

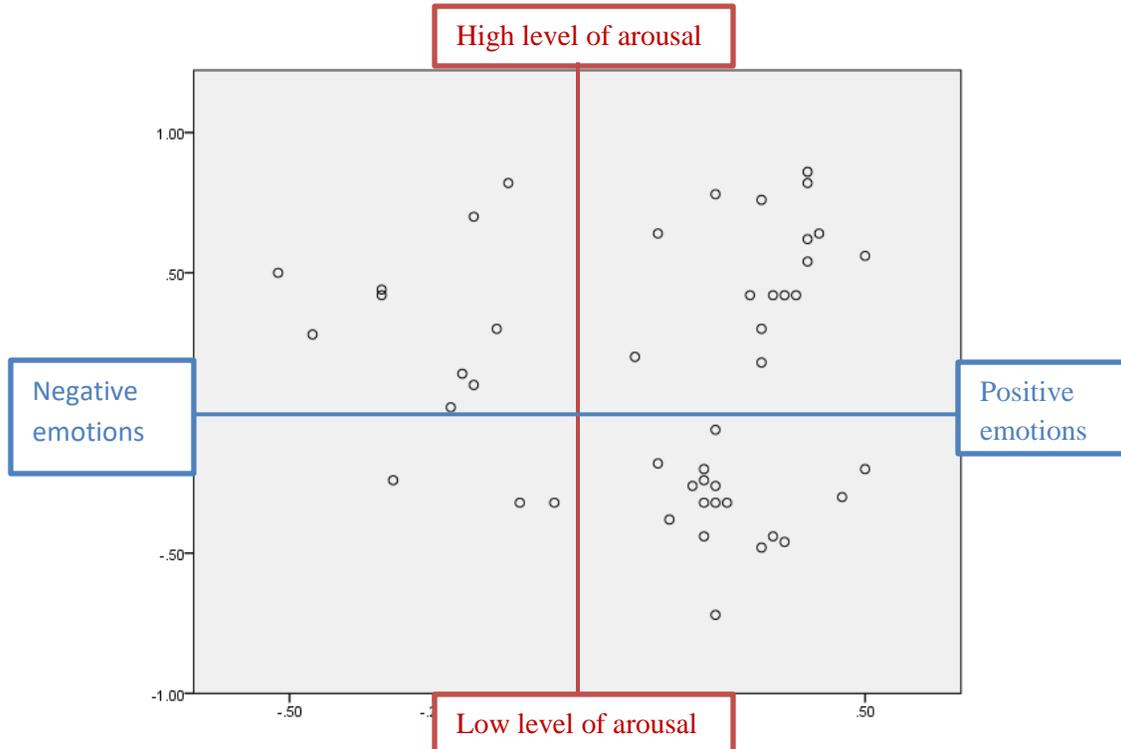
The participant with low self-compassion (Figure 1a) has the threat system activated the most during the week. In particular on Saturday and Sunday, only on Saturday morning and Sunday evening the participant felt high arousal positive emotions. For the rest of the weekend this participant experienced predominantly negative emotions.

The participant with a high self-compassion score (Figure 1b), experienced a more varied activation of the emotion regulation systems. On Friday on and Sunday the contentment system was mostly activated. On the other days the pattern of activation is more varied. What does stand out is that on Monday, Thursday, Friday and Saturday, at the first measurement of the day this participant has an activation of the threat system, meaning that this person experienced negative emotions in the morning. On the other days there was an activation of the threat system at the second or third measure point, meaning this participant had an activation of the threat system later in the morning.

For further exploration, a scatterplot was created from the same data, to see where the participant placed it coordinate on the emotion quadrant at the measurement points. Within the scatterplot the division between the three emotion regulation systems is indicated.



A) Participant low in self-compassion (SCS = 2.58/7)



B) Participant high in self-compassion (SCS = 5.42/7)

Figure 2: Scatterplot of scores on the emotions quadrant

Overall the participant low in self-compassion (Figure 2a) experienced mostly high arousal-positive and negative emotions and some low arousal-positive emotions. This participant had 75,5 % of the measure points an activated threat system, 22,5 % activation in the drive system and 2 % in the contentment system.

In the participant high in self-compassion (Figure 2b.) the emotion regulation systems of drive and contentment system were predominantly activated. The participant was 37% of the time in the contentment system, 34.8 % in the drive system and 28.2 % in the threat system.

Group level

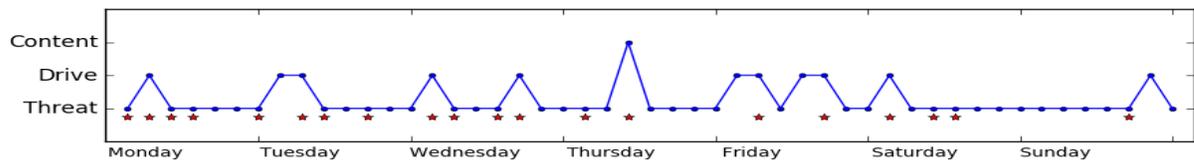
On group level the results from the regression of the score on the SCS on the percentage of the contentment system show that the relationship is not significant ($p = .296$). Meaning there is no relationship found between the level of self-compassion and the experience of low arousal-

positive emotions. Thus, individuals with a high score on self-compassion don't score more low arousal-positive emotions and thereby are not more in the contentment system than individuals with a low score on self-compassion.

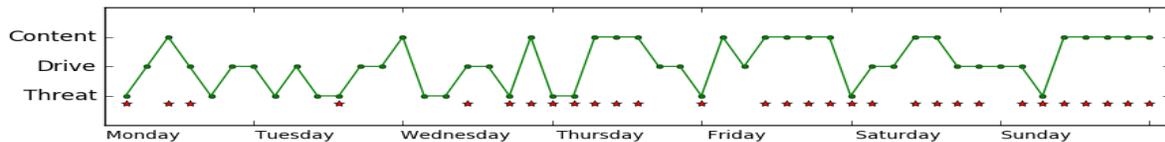
Daily hassles as a mediating effect

Individual level

First, the daily hassles were compared with the emotional state of the same participant with high and the participant with low self-compassion.



A) Participant low in self-compassion (SCS = 2.58)



B) Participant high in self-compassion (SCS = 5.42)

Figure 3. Pattern of activation of the emotion regulation systems and the experience of daily hassles over the course of the week. A red star means the participant experienced a hassle at that measure point.

In Figure 3, the relationship between daily hassles and pattern of activation of the emotion regulation systems is shown to be variable. Sometime the participants had an activated contentment system at the time a daily hassle occurred and other times the participants were in the threat or drive system. The participant who is low in self-compassion experienced 20 daily hassles over the week. The participant who is high self-compassion experienced 30 daily hassles during the week. On average, at 36 percent of the measure points a participant perceived a situation as a daily hassle.

Group level

For the mediating effect of daily hassles on the relationship of self-compassion and the contentment system table 6 shows the correlations for each of the relationships. From the correlations we can conclude that there is a small, but significant positive correlation between the variables contentment and daily hassles, meaning that people who experience many daily hassles also, in general, have an activated contentment system more often. Moreover, there is a small, but significant negative correlation between the variables daily hassles and self-compassion. This means that people who experience more daily hassles in general, tend to have less self-compassion. Lastly, the negative correlation between the variables of contentment and self-compassion is not significant.

Table 6. Correlations between the variables contentment, daily hassles and self-compassion

	Correlations	Low arousal- positive emotions	Daily hassles	SCS
Low arousal- positive emotions	Pearson R	1	.341	-.167
	Sig.		.027	.296
Daily hassles	Pearson R	.341	1	-.364
	Sig.	.027		.018
SCS	Pearson R.	-.167	-.364	1
	Sig.	.296	.018	

Since, not all of the three relationships were significant, it could be concluded that there is no mediating effect of daily hassles on the relationship between self-compassion and the activation of the contentment system. Which means that self-compassion does not work as a buffer for the experience of daily hassles, thereby keeping the contentment system activated.

Discussion

The aim of this study was to test the theory of Gilbert (2009) of the three emotion regulation systems that is the foundation of Compassion Focused Theory (CFT). Experimentally CFT has shown to be an effective therapy for several psychological disorders and people high in self-criticism (Leaviss, & Uttley, 2014; Gale et al, 2012; Braehler et al, 2012; Lucre & Corten, 2012). However empirically there is not much evidence supporting the theory of Gilbert (2009) yet, specifically, the assumption by Gilbert (2009) that people with low activation of their contentment system have imbalanced emotion regulation systems. His second assumption was that a more developed contentment system leads to a better balance between the three emotion regulation systems. The third main assumption that Gilbert (2009) makes is that a higher level of compassion leads to a more developed contentment system. Only on a physiological level Morrone-Strupinsky and Depue (2004) found some evidence supporting the assumptions of the foundation of the theory, namely that the contentment system and the drive system are associated with different nervous systems and different hormones.

In order to test the assumptions on an emotional level, this study first investigated the ratio of activation of the emotion regulation systems in people. The results showed that indeed the threat and drive system were significantly activated the most, in almost 90% percent of all the measurements one of either was activated. The contentment system was significantly under activated compared to the other two. This shows evidence for the assumption of Gilbert (2009) that most people have an over activated threat and/ or drive system. As argued above an over activated threat system, leading to experiencing negative emotions and thinking negative thoughts could in turn lead to psychological problems in the long term (Leary, et al. 2007). Therefore, focusing on rebalancing the system by focusing on developing the contentment system seems to be an accurate goal according to the findings.

Secondly, the relationship between self-compassion and the activation of the contentment system at an individual and group level was investigated. On the individual level the results for a participant high in self-compassion did show a more varied activation pattern of the three emotion regulation systems, in which the contentment system was activated about 37% percent of the time. Compared to the participant low in self-compassion, who only spent 2% percent of the time of the time in the contentment system. However, on the group level no significant

relationship was found between the activation of the contentment system and the level of self-compassion. Therefore, these results did not support the second assumption of Gilbert (2009) that people who have more self-compassion also experience more low arousal-positive emotions and thereby have a more developed contentment system. This is contrary to what other research predicted, namely that self-compassion could buffer against the experience of negative emotions and have positive effect on the emotional state of being (Neff et al., 2007).

A reason for the findings not supporting previous findings and the predictions could be that, in general, the contentment system showed very little activation, meaning that the statistical analyses were performed on a small part of the total data. Ideally, a larger dataset would also mean more measure points for the contentment system, thereby giving more accurate results. Moreover, measuring emotions via an emotion quadrant is a new way of measuring. It was a first trial of a new approach to the measure of emotions. The advantage of this emotion quadrant could be that the participant can indicate exactly how it feels in the quadrant and is not bound to a certain set of descriptive emotions. A disadvantage could be that on the basis of one measure a prediction is done in which type of emotion regulation system that person is. Ideally this is done with more than one measure, for example an extra psychological or physiological measure. However, other options that were explored were difficult to operationalize and cluster. Therefore, this emotion quadrant may be a good alternative if explored further and tested on validity and reliability.

Thirdly, it was investigated whether people high in self-compassion had a more activated contentment system, because it works as a buffer for daily stressors. Earlier studies found that having a high level of self-compassion is associated with patterns of thoughts that generally facilitate people to better cope with negative events and with the experience of less negative emotions (Leary et al, 2007). On an individual level, the pattern of activation of the three emotion regulation systems and the experience of daily hassles showed no particular pattern of correlation. The daily hassles occurred with different emotion regulation systems activated. Unfortunately, also the results on group level did not support the prediction and previous research either. There was no mediating effect found, meaning that the prediction that self-compassion works as a buffer for the experience of daily hassles, thereby keeping the contentment system activated was not supported. A reason for the findings not supporting the theory could be that the daily hassles described by the participants in this study were relatively

small hassles, such as rain outside or missing a train, thereby not influencing the overall mood of the participant. Therefore, the amount of daily hassles that actually cause stress could have been inflated. Moreover, the presence of daily hassles in the past two hours of the measurement point were aggregated to an overall daily hassle score and compared with the total aggregated score of the amount of times a person was in the contentment system at the precise moment of measure. In this case two different time elements were compared. Namely, daily hassles in the past two hours and the activation of the contentment system at the precise moment of measure. It could be that by eliminating this time element through aggregation.

Limitations

Since the experience sampling method was used, the data that was collected makes it possible to analyze within subject and between subjects. For this dataset all the data was aggregated to make univariate analysis between subjects. When aggregating the data, a lot of data is eliminated. For a more in depth study a mixed model approach is recommended. Moreover, the sample size was unilateral, it only consisted of bachelor university students, with a Dutch or German culture background, who were in their twenties. Therefore, the level of compassion doesn't affect their emotional state as much as for the people with pathological problems that are treated with CFT, as the effectiveness of CFT has mostly been for participants with certain pathology, such as mood disorders and eating disorders (Leaviss, & Uttley, 2014; Gale et al, 2012).

Conclusion

This study tried to find supporting evidence for the theory of Gilbert (2009) about the three emotion regulation systems (threat, drive and contentment) and the influence of compassion on the balance of the three systems, which is the foundation for CFT. Moreover, it was explored if daily hassles could have a mediating effect on the relation of compassion to the activation of the contentment system. Even though an imbalance in the three emotion regulation systems was found, namely an over activated drive and/or threat system, the results were inconclusive. The relation between self-compassion and the activation of the contentment system was not found. Also, the effect of daily hassles on this relation could not be supported by the findings. Thus, the results do not support the theory of Gilbert (2009). This might be partly due

to some measurement issues and this study being the first trial of a new form of measuring emotions.. Considering that the effectiveness of CFT has experimentally been tested and some evidence has been found on an physiological level, further research is recommended.

Suggestions for future research are to replicate studies with the emotion quadrant to provide evidence that the division based on positive and negative and the level of arousal is complete and a valid way to measure the construct of emotions and to find support on an emotional level for the theory of Gilbert (2009) on the foundation of CFT. Since the experiments on Compassion Focused Therapy show promising results, it is worth knowing the working of it on a theoretical basis and have empirical evidence supporting it.

Bibliography

- Allen, A. B., & Leary, M. R. (2010). Self-compassion, stress, and coping. *Social and Personality Psychology Compass*, 4(2), 107–118.
- Barnard, L. K., & Curry, J. F. (2011). Self-compassion: Conceptualizations, correlates, & interventions. *Review of General Psychology*, 15(4), 289-303.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.
- Borgenjen, F. (2015). UT Survey [Mobile application software]. Retrieved from: <https://play.google.com/store>.
- Braehler, C., Gumley, A., Harper, J., Wallace, S., Norrie, J., & Gilbert, P. (2012). Exploring change processes in compassion focused therapy in psychosis: Results of a feasibility randomized controlled trial. *British Journal of Clinical Psychology*, 52(2), 199-214.
- Gale, C., Gilbert, P., Read, N., & Goss, K. (2012). An Evaluation of the Impact of Introducing Compassion Focused Therapy to a Standard Treatment Programme for People with Eating Disorders. *Clinical Psychology & Psychotherapy*, 21(1), 1-12.
- Galanakis, M., Stalikas, A., Pezirkianidis, C., & Karakasidou, I. (2016). Reliability and Validity of the Modified Differential Emotions Scale (mDES) in a Greek Sample. *Psychology*, 07(01), 101-113.
- Gilbert, P., Mcewan, K., Mitra, R., Franks, L., Richter, A., & Rockliff, H. (2008). Feeling safe and content: A specific affect regulation system? Relationship to depression, anxiety, stress, and self-criticism. *The Journal of Positive Psychology*, 3(3), 182-191.
- Gilbert, P. (2009). Introducing compassion-focused therapy. *Advances in Psychiatric Treatment*, 15(3), 199-208.
- Gilbert, P., McEwan, K., Gibbons, L., Chotai, S., Duarte, J., & Matos, M. (2012). Fears of compassion and happiness in relation to alexithymia, mindfulness, and self-criticism. *Psychology and Psychotherapy: Theory, Research and Practice*, 85(4), 374-390.
- Leary, M. R., Tate, E. B., Adams, C. E., Allen, A. B., & Hancock, J. (2007). Self-compassion and reactions to unpleasant self-relevant events: The implications of treating oneself kindly. *Journal of Personality and Social Psychology*, 92(5), 887-904.

- Leaviss, J., & Uttley, L. (2014). Psychotherapeutic benefits of compassion-focused therapy: an early systematic review. *Psychological Medicine*, 45(05), 927-945.
- Lucre, K. M., & Corten, N. (2012). An exploration of group compassion-focused therapy for personality disorder. *Psychology and Psychotherapy: Theory, Research and Practice*, 86(4), 387-400.
- MacBeth, A., & Gumley, A. (2012). Exploring compassion: A meta-analysis of the association between self-compassion and psychopathology. *Clinical Psychology Review*, 32(6), 545-552.
- Muris, P., & Petrocchi, N. (2016). Protection or Vulnerability? A Meta-Analysis of the Relations Between the Positive and Negative Components of Self-Compassion and Psychopathology. *Clinical Psychology & Psychotherapy*.
- Neff, K. D. (2003a). The development and validation of a scale to measure self-compassion. *Self and Identity*, 2, 223–250.
- Neff, K. D. (2003b). Self-compassion: an alternative conceptualization of a healthy attitude toward oneself. *Self and Identity*, 2, 85–102.
- Neff, K. D., Hseih, Y., & Dejithirat, K. (2005). Self-compassion, achievement goals, and coping with academic failure. *Self and Identity*, 4, 263–287.
- Neff, K. D., Kirkpatrick, K. L., & Rude, S. S. (2007). Self-compassion and adaptive psychological functioning. *Journal of Research in Personality*, 41(1), 139-154.
- Neff, K. D. (2011). Self-Compassion, Self-Esteem, and Well-Being. *Social and Personality Psychology Compass*, 5(1), 1-12.
- Neff, K. D., Whittaker, T. A., & Karl, A. (2017). Examining the Factor Structure of the Self-Compassion Scale in Four Distinct Populations: Is the Use of a Total Scale Score Justified? *Journal of Personality Assessment*, 1-12.
- Terry, M. L., & Leary, M. R. (2011). Self-compassion, self-regulation, and health. *Self and Identity*, 10(3), 352-362.
- Raes, F., Pommier, E., Neff, K. D., & Van Gucht, D. (2011). Construction and factorial validation of a short form of the Self-Compassion Scale. *Clinical Psychology & Psychotherapy*. 18, 250-255.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063-1070.

Appendix A.

Figure 1. Example question on the emotion quadrant coordinates

