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Compassionate mind training

and its relationship with perceived stress, poor mental health,
self-compassion and benevolence

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Compassionate mind training and its relationship with perceived stress, poor mental health, self-compassion and benevolence

THESIS FOR DOCTORAL DEGREE (PhD)

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DEDICATION

To my family, friends and Jojje and to all readers and all of you in the research team who made this possible.

POPULAR SCIENCE SUMMARY OF THE THESIS

Stress-related problems and poor mental health in the form of anxiety and depression has been rising in the last decade. Therefore it is important to evaluate new treatment methods. The purpose of this doctoral project was to develop a Swedish compassionate mind training program and to conduct studies to examine the effects in two different groups: university students and employees at the workplace.

Research on interventions comprising both compassion and self-compassion is continuously increasing, with a wide range of target populations from healthcare, schools, sports, and organizations. When starting this doctoral project there were a couple of studies that had shown promising results regarding compassion-based interventions for dealing with stress-related problems and symptoms of anxiety and depression, but many of them lacked active comparison. The evidence for an effect with compassion-based interventions relied foremost on studies with small sample sizes which was a clear limitation.

Compassionate mind training is the specific psychoeducation and skills training based on compassion-focused therapy (CFT). CFT is a psychotherapy developed for people with high levels of self-criticism and low levels of felt sense of safeness, who often experience stress-related problems. One important aim of CFT is to learn how to activate the innate caring, relaxing and soothing system all humans have, which can be done with compassionate mind training. There are various definitions of compassion and self-compassion. The definition of compassion used in CFT is "a sensitivity to the suffering of self and others, with a commitment to try to alleviate and prevent it". According to the founder of CFT, Professor Paul Gilbert "*Compassion cannot always take away or prevent the suffering but helps us navigate it*". The compassion individuals give to themselves is called self-compassion and can be described as a self-attitude used when one experience difficult emotions (e.g. shame, fear, or anger) or when one has done a mistake or feel inadequate. To develop a good mental health, it is a recommendation in CFT to cultivate compassion in three directions by giving it to others, receiving it from others, and give it to oneself. This has been included in the programs in this thesis.

There are four studies included in this thesis and following is a short summary of the results. In the first study Swedish university students with self-perceived stress-related

problems were randomized to compassionate mind training and affect-focused training, and self-assessments of self-compassion, perceived stress, anxiety, and depression were performed via questionnaires before and after the program. There was a statistically significant decrease of depressive symptoms in the compassionate mind training group, but not in any of the other measures.

In study two, Swedish university students with stress-related problems were randomized to a digitally provided (smartphone application) compassion training, mindfulness training (smartphone application) or a waitlist control. The results showed that there was no significant difference in any of the measures between the two active groups, but both compassion- and mindfulness training increased self-compassion and reduced alexithymia compared to the waitlist, whereas only compassionate mind training significantly reduced perceived stress compared to the waitlist.

In study three, employees from two Swedish work organizations were randomized to compassionate mind training and physical exercise. A significant effect on increased self-compassion was only observed in the compassionate mind training group. There were no significant differences between the two groups in any of the other measures.

In study four, two separate Swedish workplace datasets were analyzed in a cross-sectional study to investigate the concept of benevolence (e.g. acting in a prosocial manner and having a view of oneself as someone who contribute positively to the world), and its association with perceived stress, mental health (exhaustion, anxiety, and depression), self-compassion and satisfaction with life. Benevolence was significantly negatively correlated with perceived stress, emotional exhaustion, and depression, and significantly positively correlated with self-compassion. No significant correlation was found between benevolence, satisfaction with life, and anxiety.

In conclusion, the effects of compassionate mind training varied among the different studies in this thesis. The effects seemed not to be as strong as earlier research suggested when comparing to an active control group. The sample sizes were small which makes it difficult to find significant changes, if there are any. The length of the programs could also be an important factor. Recent studies indicates that longer program are needed to get beneficial effects, but more research is needed to find evidence for that. Associations between benevolence and depression and emotional exhaustion were found to be weak and a

moderate association was found with self-compassion and perceived stress. This indicates that benevolence might not function as a defense against emotional exhaustion or depression at work. The moderate association between benevolence, self-compassion and perceived stress are worth investigating further e.g. if training in benevolence could improve self-compassion and decrease stress. Future studies can build upon the findings in this thesis to increase the understanding on how and under which circumstances compassionate mind training has strongest impact.

ABSTRACT

Background: University students and employees are two populations where stress-related problems, anxiety, and depression are increasing. Interventions must be found to reverse this trajectory and to improve mental health. Research on self-compassion and compassion training as a strategy to handle high levels of perceived stress, depression, and anxiety has increased internationally during the last years. Accessibility to new effective health programs is important to spur the development within this field of psychology and mental health forward. Further, testing different delivery formats is important both in regard to accessibility as well as cost and time efficiency.

Aims: The purpose of this thesis was to develop a compassionate mind training intervention and examine its effects on mental health and stress-related problems in two groups of adults (university students and employees). Furthermore, the prosocial concept of benevolence was measured to increase the understanding of the concept and its relation to self-compassion, anxiety, depression, perceived stress, and emotional exhaustion.

Four studies were performed. The aim of the first study was to evaluate the effects of compassionate mind training on stress-related problems in university students compared with affect-focused training. Study II's aim was to evaluate the effect of compassionate mind training provided by a digital mental health solution using a smartphone application on stress-related problems in university students compared with an active control group following a mindfulness program using a smartphone application and a passive waitlist control group, respectively. In study III, the aim was to evaluate the effect of compassionate mind training on stress-related problems among employees in two work organizations compared with physical exercise. Study IV investigated the associations between the psychological concepts of benevolence and stress, mental ill-health, and self-compassion among employees.

Study I: Comparing the effects of compassionate mind training to an affect-focused training on university students with self-defined high levels of stress.
Study II: Comparing the effects of digital compassionate mind training to an active control consisting of digital mindfulness training and a passive waitlist control on university students with stress-related problems.

Study III: Comparing the effects of compassionate mind training to physical exercise on employees with self-defined high perceived stress in two organizations.

Study IV: Investigating the associations between the psychological concept of benevolence and perceived stress, mental ill-health (e.g., emotional exhaustion, anxiety, and depression symptoms), satisfaction with life, and self-compassion among employees in two datasets.

Methods: A compassionate mind training program was developed and evaluated in randomized controlled trials (studies I, II and III) and the data were analyzed by mixed effects models. Study IV used a cross-sectional design. An informed consent form was filled out by all participants in each study.

Study I included 55 Swedish university students (mean age = 26) randomized to compassionate mind training (n = 28) and affect-focused training (n = 27). Assessment was done at pre- and posttraining evaluating participants' self-reports on a self-compassion scale short form (SCS-SF), hospital anxiety and depression scale (HADS), and perceived stress scale (PSS-14). Mixed-effects regression models were used to analyze data.

Study II included 57 Swedish university students (mean age = 25) who were randomized to digitally provided digital compassionate mind training (n = 23), digital mindfulness training (n = 19), and a waitlist (n = 15). The primary outcomes involved the perceived stress scale (PSS-10) and self-compassion scale short-form (SCS-SF), and secondary outcomes involved the Toronto alexithymia scale (TAS-20) and the clinical outcomes in routine evaluation-outcome measure (CORE-OM). Data were analyzed with multilevel growth models that provide advantages when analyzing repeated measures data from randomized between-group design.

Study III included 49 employees from two work organizations who were randomized to compassionate mind training (n = 25) and physical exercise (n = 24). The participants filled in a self-report on the self-compassion scale (SCS), the perceived stress scale (PSS-14), the hospital anxiety and depression scale (HADS) and the satisfaction with life scale (SWLS). Mixed-effect growth models were applied to analyze the data.

Study IV consisted of two cross sectional studies including 571 employees based on two dataset from five work organizations and examined the association between a new measure of the concept of a benevolence scale (BS) and self-report measures of a perceived stress

scale (PSS-14) and emotional exhaustion (MBI-EE), symptom checklist, core depression subscale (SCL-CD6), The hospital anxiety and depression scale (HADS), the self-compassion scale (SCS), and the satisfaction with life scale (SWLS). Data were analyzed using bivariate Pearson r correlations.

Results: The results of study I showed that compassionate mind training and the affect-focused training did differ significantly on the outcome measures of depression ($p = 0.02$) but not on the other measures of self-compassion, perceived stress, and anxiety.

Study II found no significant effects between the mindfulness group and the compassionate mind training group. However, both digitally provided compassionate mind training and mindfulness training increased self-compassion ($p < 0.001$) and decreased alexithymia ($p = 0.01$), respectively, compared to the waitlist. Only compassionate mind training significantly reduced stress ($p = 0.027$) compared to waitlist. No significant effect was found on global psychological distress ($p = 0.227$) in any of the groups.

Results of study III showed that compassionate mind training and the physical exercise did differ significantly on the outcome measure of self-compassion ($p = 0.03$) but not on any of the other measures: perceived stress, anxiety, depression, and satisfaction with life.

In study IV, results showed that benevolence was significantly and negatively correlated with perceived stress ($r = -0.392$), depression symptoms checklist ($r = -0.190$) depression symptoms ($r = -0.310$) emotional exhaustion ($r = - -0.295$) and significantly and positively correlated with self-compassion (0.401). However, benevolence was not significantly associated with either satisfaction with life ($r = 0.148$) or anxiety ($r = -0.199$).

Conclusions: Compassionate mind training delivered both in a group setting and using a smartphone application showed weak results in the included studies. Reasons for this could depend on various factors such as low statistical power due to small group sizes, or that the compassionate mind training intervention is not an effective method compared to the active control groups: affect-focused training, mindfulness, or physical exercise. The results could also depend on low baseline values on the outcome measures which does not give room for improvements. It shows that compassionate mind training can be effective using a smartphone to train self-compassion and decrease perceived stress, anxiety and depression symptoms compared to a waitlist. It was observed that self-assessed benevolence was

associated weakly with emotional exhaustion and depression, and moderate associated with perceived stress and self-compassion but the finding have low statistical value due to the cross-sectional design.

The compassionate mind training studied in the current thesis showed minimal or no effects on mental health measured as perceived stress, anxiety, depression, and self-compassion on the populations of university students and employees. More robust studies need to be conducted with larger samples. Future studies should preregister the plan for statistical analysis and have a careful screening procedure of the participants as well as a strategy for adherence to prevent and avoid attrition. Also, long-term follow up and mixed-method studies are needed to further evaluate the impact of compassionate mind training, investigating when, how, and for whom compassionate mind training is beneficial, as well as the role of benevolence in stress, mental health, and self-compassion.

LIST OF SCIENTIFIC PAPERS

I. Andersson, C., Støre, S. J., Gunnarsson, M., Säldebjer, H., Bergsten Lindert, K. & Osika, W., The effects of Compassionate Mind Training on perceived stress, anxiety and depression in university students – A randomized controlled trial. (Submitted Anxiety, Stress & Coping)

II. Andersson, C., Bergsten, K. L., Lilliengren, P., Norbäck, K., Rask, K., Einhorn, S., & Osika, W. (2020). The effectiveness of smartphone compassion training on stress among Swedish university students: A pilot randomized trial. Journal of Clinical Psychology, 10.1002/jclp.23092. https://doi.org/10.1002/jclp.23092

III. Andersson, C., Mellner, C., Lilliengren, P., Einhorn, S., Bergsten, K. L., Stenström, E., & Osika, W. (2021). Cultivating Compassion and Reducing Stress and Mental Ill-Health in Employees – A Randomized Controlled Study. Frontiers in Psychology. https://doi.org/10.3389/fpsyg.2021.748140

IV. Andersson, C., Stenfors, U. D. C., Lilliengren, P., Einhorn, S., & Osika, W. (2021). Benevolence – Associations with Stress, Mental Health and Self-Compassion at the workplace. Frontiers in Psychology. https://doi.org/10.3389/fpsyg.2021.568625

CONTENTS

LIST OF ABBREVIATIONS

ACT	Acceptance and Commitment Therapy
BS	Benevolence Scale
CBT	Cognitive Behavior Therapy
CFT	Compassion Focused Therapy
CMT	Compassion Mind Training
CORE-OM	Clinical Outcomes in Routine Evaluation – Outcome Measure
MBI-EE	Maslach Burnout inventory, emotional exhaustion subscale
MBSR	Mindfulness based stress reduction
MLM	Multilevel growth models
PSS10	Perceived Stress Scale
PSS14	Perceived Stress Scale
RCT	Randomized controlled trial
SCL-CD6	Symptom checklist, core depression subscale
SCS-SF	Self-Compassion Scale – Short Form
SWLS	Satisfaction with Life Scale
TAS-20	Toronto Alexithymia Scale
WHO	World health organization
WLC	Waitlist control

FOREWORD

Research and application of compassionate mind training has increased during the last 10 years both in clinical and non-clinical settings. However, randomized controlled trials (RCT) in this research field have been rather few, so the purpose with my doctoral project was to develop a compassionate mind training intervention as a psychological program to target perceived stress, anxiety, depression symptoms and self-compassion in two different contexts: university students and employees in work organizations and evaluate it via RCTs.

My interest in the field of self-compassion began around 12 years ago, when I co-authored a Swedish book on compassion-focused therapy (CFT) for higher education. A large part of the doctoral thesis has been on learning how to design studies and to gain knowledge about different self-report measurements and to read a lot of science articles and books within this field of stress, mental health, compassion, and self-compassion training.

The result of this thesis adds to our understanding of the effects and impact of compassionate mind training as a psychological method for reducing stress and improving well-being. Hopefully it will inspire others to do more research in the field.

Örnsköldsvik, winter 2023

1. INTRODUCTION

1.1 MENTAL HEALTH

"Mental health is a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community" (World Health Organization, 2022).

Poor mental health is increasing globally, including in Sweden (Gustavson et al., 2018; Patel et al., 2007; Patel et al., 2018). Sick leave due to mental ill-health has also increased in Sweden, where stress related problems are the main driver of that increase. According to a report from the Swedish Social Insurance Agency, there was a 13% increase in stress-related diagnoses from July 2019 to July 2022. In a recent report by the Public Health Agency of Sweden (2021), 15% of the Swedish population from 16–84 years of age experienced stress, and in the age group 16–29, 27% reported experiencing stress. In particular, 36% of women and 18% of men aged 16–29 reported problems with stress. These numbers have increased each year, with consistently higher numbers for women than men. This increase has also been observed among students attending higher education (Bayram & Bilgel, 2008; Evans et al., 2018; Huang et al., 2018).

1.1.1 Stress among university students

The incidence of mental health problems, including depression and anxiety, has increased over time among university students (Lipson et al., 2021). According to Duffy et al. (2019), mental health symptoms have nearly doubled among the U.S. college student population from 2007-2018. Similar levels of anxiety, distress, and depression have been seen among students in Sweden (Public Health Agency of Sweden, 2018). Also, an inverse association between mental ill-health and student achievement, as well as subsequent postgraduate plans has been shown (Beiter et al., 2015). Attending university may entail considerable stress, and many students report experiencing high levels of academic pressure. Further, feeling lonely moving away from home, and trying to meet new friends are additional challenges that could trigger self-criticism and mental ill-health (Binder et al., 2019). Other stressors are fear of failure, personal inadequacy, or difficulties in relationship to teachers (Reddy et al., 2018). Even though there are ways to get help at universities, many university students who feel bad do not seek help. Only 24.6% of first-year students said they would seek treatment if they had mental health problems (Ebert et al., 2019). Students face many barriers to using the treatment programs offered through university health care. For example, a major reason for not seeking help was that students wanted to handle the

problem alone (56.4%) or talk to a friend or relative instead (48%), but many of the students who reported they wanted to handle it alone also mentioned that feeling shame was part of the reason for not seeking outside help (Dunley & Papadopoulos, 2019). Mental health problems among university students, during their studies at the university are associated with lower performance and academic success and increased risk of dropping out (Eisenberg et al., 2009). This, in turn, has an impact on the future workforce, who needs the right qualifications for carrying out the job. Universities have a unique opportunity to identify risk and deliver programs both for preventing and decreasing mental ill-health.

1.1.2 Stress among employees at the workplace

It is imperative to address mental health at work because stress and poor mental health cost organizations large amounts of money each year (WHO, 2020). In addition, the cost of individual suffering is high, affecting productivity and efficiency. In Sweden, stress-related mental ill-health is one of the largest causes of long-term sick leave (Swedish Social Insurance Agency, 2021). One objective of the United Nations Agenda for Sustainable Development (2020) is to promote mental health. This relates to all social arenas, including universities and workplaces. Because those locales are where most people spend a large amount of their time, it would be valuable to offer programs that prevent mental ill-health in these places. In relation to prolonged stress at work, the concept of "burnout" is regarded as a stress-related mind-body state (Maslach & Jackson, 1981). Symptoms associated with burnout include emotional exhaustion, depersonalization, impaired personal accomplishment, difficulty concentrating, impaired memory, irritability, fatigue, and cognitive problems (Grossi et al., 2015; Maslach & Jackson, 1981; Maslach & Leiter, 2016; Swedish National Board of Health and Welfare, 2003). The fourth study in this thesis used the emotional exhaustion subscale from the Maslach burnout inventory questionnaire (MBI-EE; Schaufeli et al., 1996; Schutte et al., 2000), to examine the association between emotional exhaustion and benevolence among employees.

1.2 DEFINITIONS OF COMPASSION

There are many definitions and theoretical frameworks for the concept of compassion (Mascaro et al., 2020; Matos et al., 2021). The *Oxford English Dictionary* defines compassion as "an emotional response to suffering" (Compassion, 2019). Compassion can be compared to concepts such as altruism (Gilbert, 2020) and empathy, which can be defined as a process in which a person (a) understands, (b) feels, and (c) shares another person's world (d) with self-other differentiation (Håkansson et al., 2021) and sympathy

(Gilbert, 2010a). There is also a difference between compassion and kindness and love (Gilbert et al., 2019) and pity (Dodson & Heng, 2022) making it important to clarify the concept of compassion. Paul Gilbert, the founder of compassion focused therapy (CFT), applied the following definition of compassion "A sensitivity to suffering in self and others with a commitment to try to alleviate and prevent it" (Gilbert, 2014 p. 19). Strauss et al. (2016) described compassion as a five-step process including different definitions and methods that target the measurement of compassion: (a) recognizing suffering, (b) understanding the universality of human suffering, (c) feeling for the person suffering, (d) tolerating uncomfortable feelings, and (e) having the motivation to act/acting to alleviate suffering. Goetz et al. (2010) defined compassion as the feeling that arises in witnessing another's suffering, which motivates a subsequent desire to help. This definition conceptualizes compassion as a trainable skill but still more as an emotional state than a trait, whereas Gilbert (2017) presented compassion as a motivation, which can be impacted depending on one's emotional state.

Feldman and Kuyken (2011) described compassion in this way:

> Compassion is the acknowledgment that not all pain can be fixed or solved but all suffering is made more approachable in a landscape of compassion. Compassion is a multi-textured response to pain, sorrow, and anguish. It includes kindness, empathy, generosity, and acceptance. The strands of courage, tolerance, equanimity is equally woven into the cloth of compassion. Compassion is an orientation of mind that recognizes pain and the universality of pain in human experience and the capacity to meet that pain with kindness, empathy, equanimity, and patience. While self-compassion orients to our own experience, compassion extends this orientation to others experience." (p. 144)

In the context of working life, organizational compassion has been described as a three-part process: (a) noticing another's suffering, which requires being open to one's context; (b) empathic concern or thinking from another person's perspective; and (c) some kind of response to take action (Frost et al., 2006). A more recent description of organizational compassion more comprehensively depicts a four-step process: "(a) noticing that suffering is present in an organization, (b) making meaning of suffering in a way that contributes to a desire to alleviate it, (c) feeling empathic concern for the people suffering, and (d) taking action to alleviate suffering in some manner" (Worline & Dutton, 2017).

All of these definitions give a different perspective from which we can examine compassion. The definition provided by Strauss et al. (2016) is appropriate when learning how to understand the process of compassion and explaining that it is something that can be trained at each stage of the five-step process. There is a broad spectrum on how long it takes to cultivate compassion or self-compassion, and research has still not fully answered questions regarding whether everyone can develop compassion and whether some circumstances are preferable than others. There is evidence that the more compassion we receive and experience early in life, the easier it is to develop compassion for others and for the self (Gillath et al., 2005).

1.3   SELF-COMPASSION AS A PSYCHOLOGICAL CONCEPT

Several correlational and experimental studies have addressed self-compassion over the last 20 years. Self-compassion can be operationalized as both a state and a trait (Dodson & Heng, 2022) and can be cultivated through targeted interventions (Bluth & Neff, 2018; Ferrari et al., 2019; Kirby et al., 2017a). Self-compassion can be explained as "a way of relating to ourselves in times of suffering, characterized by increased kindness and reduced self-judgment, increased feelings of common humanity and decreased isolation, and greater mindfulness and less over-identification with difficult thoughts and feelings" (Neff, 2003a; 2011). Having self-compassion is different from having self-esteem. The latter is associated with social comparison, which could negatively impact well-being (Neff, 2014; Neff & Vonk, 2009). Higher levels of self-compassion increase compliance with medical recommendations (Terry & Leary, 2011) and make people seek medical attention sooner when they are ill (Terry et al., 2013). Self-compassion also can increase health-promoting lifestyle behaviors in college students (Gedik, 2019). Yarnell et al. (2015) found that men tended to report higher levels of self-compassion compared with women. Barnard and Curry (2011) found that individuals who reported higher levels of self-compassion also reported higher levels of social connectedness, life satisfaction, emotional intelligence, and happiness, along with less depression, anxiety, fear of failure, shame, and burnout. They also motivate themselves by wanting to learn (Breines & Chen, 2012). Self-compassion has a positive impact on happiness levels and self-esteem (Mongrain et al., 2010), making individuals less self-handicapping (Petersen, 2014) and possibly promoting self-regulation by lowering defensiveness and reducing these emotional states and self-blame.

Self-compassion has a negative correlation to psychopathology (MacBeth & Gumley, 2012) and can be described as protective against mental ill-health such as depression, anxiety, and

stress-related problems (Finlay-Jones, 2017; Raes, 2011), self-criticism (Wakelin et al., 2021), perfectionism (Woodfin et al., 2021), and social anxiety disorder (Werner et al., 2012). Moreover, self-compassion has been found to have a large negative correlation with psychological inflexibility (Kılıç et al., 2022). Self-compassion is a better strategy than distraction or rumination (Odou & Brinker, 2014). It is also associated with increased physical health and health-promoting behaviors (Homan & Sirois, 2017) and psychological functioning (Neff et al., 2007) and to achieve academic goals and cope with academic failure (Neff et al., 2005) and in self-care behavior (Ferrari et al., 2017) and psychosocial outcomes (Ferrari et al., 2019). In a pilot study over 9 weeks, a compassion meditation intervention targeting anger as an outcome measure for chronic pain patients (n = 12) found a reduction in pain severity and an increased acceptance of the patients' pain (Chapin et al., 2014). Further, self-compassion has been found to be positively associated with coping with chronic pain in daily life (Davey et al., 2020), which is in line with findings from a systematic review based on 15 self-compassion studies including patients with chronic physical health conditions. It was shown that self-compassion increased with medium to large effect sizes, and that increases in self-compassion was associated with improvements in depression, anxiety, stress, sleep, and mindfulness (Kılıç et al., 2021).

In other words, self-compassion can be described as a mind-body state where one experiences a loving and connected presence with oneself. Earlier research shows that some individuals have difficulties generating self-compassion and/or receiving compassion from others, which could be associated with early difficult experiences and with psychopathological symptoms. The associations between traumatic shame memories and memories of warmth and safeness were evaluated together with fears of compassion and depression, anxiety, and paranoid symptoms by Matos et al. (2017b). A total of 302 participants from a general community filled in self-reports that revealed traumatic shame memories to be positively associated with fears of compassion for oneself and from receiving it from others. On the other hand, memories of warmth and safety were negatively correlated to these fears. An analysis showed that the fears of having self-compassion and receiving compassion from others, mediated effects of trauma shame memories, and early memories of warmth and safeness on depressive, anxious, and paranoid symptoms (Matos et al., 2017b).

Some meta-analyses demonstrated the benefits of self-compassion on well-being (Zessin et al., 2015), the effectiveness of self-compassion-related therapies (Wilson et al., 2019), and

the effect of self-compassion on subjective sleep quality (Butz & Stahlberg, 2018). Athanasakou et al. (2020) conducted a meta-analysis including 28 studies on the concept of self-compassion based on the definition by Neff (2003a). Clinical samples had lower self-compassion than nonclinical samples, but more research is needed to know whether low self-compassion is an effect of psychopathology or low levels of self-compassion are a vulnerability factor for it. Muris and Petrocchi (2017) conducted a meta-analysis including 18 studies on the self-compassion scale made by Neff (2003b) with the aim of studying the different subscales of self-compassion (26- and 12-item scales, respectively) and their relations to various types of psychopathologies. Positive indicators (kindness, mindfulness, common humanity) of self-compassion were negatively associated with psychopathology, which indicate a protective effect of self-compassion on mental health. Negative indicators (self-judgment, over-identification, and isolation) were positively associated with psychopathology, and the authors highlighted that these scales can be used to identify someone's vulnerability to mental health problems.

Several authors have shown that higher levels of reported self-compassion are associated with better mood and health behavior, but this has not been confirmed across all studies (Kirby et al., 2017a). This heterogeneity in findings could be due to studies' small samples sizes, which yield low power (Andersson et al., 2020). It might also be that compassionate mind training is not the most effective method available. Many studies also did not get published when the result was not significant (publication bias), which makes it difficult to get a reliable overview of how effective compassionate mind training is. Within CFT, self-compassion is developed with the aims of cultivating the compassionate self and strengthening all directions of compassion flow. In compassionate mind trainings, participants learn to develop qualities of compassion such as wisdom, stability, strength, warmth, kindness, and non-judgment. A primary aim in CFT is to cultivate the intention of compassion and, with that, courage and engagement to turn toward suffering. Secondary is the process of alleviating suffering by developing the compassionate self, which is described as developing self-compassion.

1.4 COMPASSION-FOCUSED THERAPY (CFT)

1.4.1 Background

CFT can be explained as an evolved biopsychosocial approach to understand suffering in our lives and what we need for our survival. It is an integrated approach including

psychodynamic theories and cognitive behavioral theories (Gilbert, 2016). Patients seeking CFT often exhibit problems with emotion regulation and high levels of self-criticisms. CFT targets shame and self-criticism by establishing an inner safety. Creating a felt sense of compassion enables looking at one's problem from a different state of mind, thereby supporting the healing process. CFT helps to organize the mind and body by helping people developing the skills and courage to engage in the suffering they or others are experiencing, and then using the wisdom to actively to address and prevent it. A major focus is on learning to turn toward suffering rather than away from it. The skills training that leads to a compassionate mind aims to prepare a person to alleviate and prevent suffering (Gilbert, 2015; 2019a; 2019b).

1.4.2 Research on CFT

CFT involves skills training such as compassionate mind training and includes techniques like imagery exercises to strengthen positive feelings and social relationships to improve mental health. An increasing number of intervention studies indicated that compassion training has a potentially beneficial effects on stress, depression, and anxiety (Kirby et al., 2017a). Judge et al. (2012) conducted an explorative group-based CFT on a clinical sample with various diagnoses (e.g., severe depression, bipolar disorder). The CFT treatment was delivered over 12–14 weeks, and the result showed a significant decreased in self-criticism, stress, anxiety, and depression, among others. A systematic review (Leaviss & Uttley, 2014) of psychotherapeutic effects of CFT in clinical populations showed decreased symptoms of anxiety and depression. CFT and compassionate mind training seem to yield beneficial improvements and potential for positive change within a plethora of diagnostic specific populations of psychosis (Braehler et al., 2013), personality disorders (Lucre & Corten, 2013), eating disorders (Kelly et al., 2017), bipolar diagnosis (Gilbert et al., 2022) treatment-resistant depression (Asano et al., 2022), and treatment-resistant OCD (Petrocchi et al., 2021). In a transdiagnostic group, CFT treatment was compared to a group that received treatment as usual (TAU), and findings showed reduced levels of psychopathology in the CFT group, which were explained by changes in levels of self-criticism and fear of self-compassion. The treatment included 14 sessions, two weekly sessions over 5 weeks and then once weekly over 4 weeks, (Cuppage et al., 2018). Austin et al. (2021) conducted a systematic review of various compassion-based interventions, such as mindful self-compassion (MSC), compassion-focused therapy (CFT), cognitively-based compassion training (CBCT), attachment-based compassion therapy (ABCT), and compassion cultivation training (CCT), for people with chronic physical conditions. Participants

consistently showed reductions in depression and anxiety, and qualitative findings showed acceptance of their condition, reduced feelings of isolation, and improved emotion regulation skills (Austin et al., 2021). There was a difference between the methods studied, where brief interventions were found to be effective on self-compassion, and more comprehensive interventions affected depression and anxiety.

Another systematic review of compassion meditation demonstrated improvements in five psychological outcome domains: psychological distress, positive and negative affect, positive thinking, empathic accuracy, and interpersonal relations (Shonin et al., 2015). A more recent study found that compassion was a protective factor during the COVID-19 pandemic due to an expanded sense of safeness (Matos et al., 2022b) which is in line with the domains above. Compassionate mind training has also been tailored to be applied outside health care. Matos et al. (2022a) addressed teachers with high levels of stress and burnout symptoms. They were randomized to either compassionate mind training or a waitlist. The intervention was 8 weeks and included six modules. Findings showed significant improvement in psychological well-being and reduced levels of burnout, depression, anxiety, self-criticism, and fears of compassion in the compassion group. Heart rate variability (HRV), an indirect measure of the activity of the vagus nerve, was also tested pre- and postintervention in a subsample. Significantly higher postintervention levels of HRV, an indication of a balanced nervous system and that one can adapt to the environment, was found within the compassion group. Taken together, CFT appears to be effective on specific diagnoses as well as in group-treatment with mixed psychiatric diagnoses, making CFT a promising transdiagnostic therapy for range of mental health problems. More and more research is being conducted on nonclinical population with promising results. One important finding is that most of the research on CFT has been conducted in group formats, and it seems to be most effective when the intervention includes at least 12 hours of training (Craig et al., 2020).

1.4.3 Key points in CFT

There are some core principles of CFT, one of which is to help patients learn about the nature of the evolved mind, and how the evolution of our brain can impact our feelings and reactions in certain situations. Understanding this enables a person to be less hard on themselves, allowing them to look at things from a non-self-blaming viewpoint because we have tricky brains. Gilbert (2010a, 2020) described how CFT is very much rooted in evolutionary science. In CFT, compassion is seen as an evolved motive. It arises from what

is called "mammalian care" and has evolved into what we know as "compassion" today. A primary focus in CFT is to make use of and activate the motivational system of caring.

1.5   COMPASSIONATE MIND TRAINING

The psychoeducation and skills training in compassion-focused therapy is called compassionate mind training. Hence, a huge part in CFT is the skills training, compassionate mind training, which is based on for example guided discovery, Socratic dialogues, exposure behavioral experiment, reappraisal, mindfulness, and guided imagery exercises in compassion. CFT is thus a process therapy, meaning that it primarily seeks to understand the processes on how to access the caring system. This doctoral project used the tools that are included in compassionate mind training and applied them on nonclinical samples.

1.5.1   The Swedish version of compassionate mind training intervention and its refinement

A description of the interventions can in more depth be found in each of the articles at the end of this thesis. In all three compassionate mind training programs used in this doctoral project, there were mostly similar themes, and each session included theory, guided meditations, small talk in groups (except in study II), and behavior exercises. The program incorporated attachment theory, neuroscience, contemplative traditions such as mindfulness and loving-kindness, cognitive behavioral therapy, psychodynamic therapy, and affect theory (Kirby, 2017). I and Katja Lindert Bergsten, both clinical psychologists trained in CFT, delivered the program in studies I and III (Gilbert, 2009, 2010a) and MSC (Neff & Germer, 2013). We each had over 5 years of personal practice, had experience in facilitating processes of compassion and self-compassion, and were well-versed in practical and academic knowledge of the psychological background that the program emanated from.

The programs started with an introduction to the concept of compassion and then the three-circle emotion-regulation model, self-compassion and fears, blocks and resistance of compassion, self-criticism, and compassion mindset (how to develop qualities of compassion), giving compassion to others, and finally wisdom and gratitude. The content was adapted from earlier studies on compassion (Gilbert, 2010a; 2010b; Neff & Germer, 2013). Many other compassion programs start with mindfulness practices, but in the Swedish version we started with a focus on inner safeness to regulate the mind and body and quickly introduce the concept of self-compassion, and psychoeducation on

neuroplasticity and soothing as a stress-regulation strategy. All study participants were kindly reminded to practice daily, between the weekly sessions.

In study I, the compassionate mind training program was 5 weeks long. After that, we decided to extend the program with 1 week to reach over 6 weeks instead in studies II and III. The themes for the six modules were (a) introduction to compassion; (b) the three-circle model of affect regulation (Gilbert, 2010b); (c) self-compassion; (d) self-criticism and developing qualities of compassion as forgiveness, warmth, acceptance, kindness; (e) giving compassion to others; and (f) wisdom and gratitude. Each module included five main components (a theoretical background, reflective practices, guided meditations, breath work, and behavior exercises) to encourage the implementation of a compassionate attitude in people´s daily life. A longer program is closer in line with the result from a meta-analysis by Craig et al. (2020) who recommended at least 12 hours of compassionate mind training. Changes were also made in the intervention by not having a small-group module in the smartphone intervention because the idea was to be a solely self-help program. Reflection and remodeling have been an important process of developing the included compassionate mind training interventions.

1.6   TRAINING THE MIND

Mental training is essential in CFT to help an individual work through challenges and make necessary changes in their life. Our mind changes in relation to our experiences—both positive and negative—and this phenomenon is called neuroplasticity (Davidson & Lutz, 2008). Mental well-being can be furthered by understanding the neurobiology of emotions and by doing guided meditations to train the mind (Dahl et al., 2016; Davidson & Goleman, 2017). There is a large overlap between regions in the brain that are stimulated by real experience and by visualization (Kosslyn et al., 2001), and the brain can have difficulties differentiating between something happening in real life or only in the mind (Holmes & Mathews, 2010). Research has also shown that visualizing impacts our emotional system to a larger extent than does cognitive processing. Mental training can also activate memories (Holmes & Mathews, 2010). An important part of CFT is reshaping trauma memories into memories that stimulate the safeness system, and this can be done through guided compassion meditations (Matos et al., 2017b). There are several guided imagery compassion practices with some being more common and used in different studies such as the compassionate self, receiving and giving compassion, creating an ideal compassion, and developing self-compassion.

Using mental training in nonclinical settings is associated with well-being. In addition, mental training in positive and social emotions is associated with optimism (Blackwell et al., 2013) and self-efficacy (Pop & Tiba, 2019). Compassion training can strengthen positive affects associated with the reward and social connections network in the brain along with turning off the social disconnection and threat network (Klimecki et al., 2013; Klimecki, 2015). Training in compassion can change the function of these system. This is of great importance as perceived stress, anxiety, and depression activates the threat and disconnection system. Compassion meditation involves exercises designed to regulate the brain's emotional system, particularly in relation to social emotions (Engen & Singer, 2015) and upregulate positive affects (Förster & Kanske, 2022). Trautwein et al. (2020) found that different kinds of meditation (e.g., compassion meditation compared to attention-focused meditation) activate different structures in the brain and have different benefits. Compassion meditation had a larger impact on social emotions, whereas focused attention had a larger impact on concentration and focus. Hofmann et al. (2011) achieved a similar result that compassion meditation and lovingkindness meditation (LKM) increase a positive affect, and decreases a negative affect. The authors also implied that this form of mental training in combination with psychological treatments will support the outcome.

1.7   THE FLOW OF COMPASSION

Compassion can flow in three directions (see Figure 1): receiving compassion, giving compassion, and directing compassion to oneself (i.e., self-compassion; Gilbert et al., 2017; Gilbert, 2020). People can have different relationships with developing and experiencing compassion depending on the direction, and some find it more difficult than others (Gilbert et al., 2011). Therefore, various barriers such as fears, blocks, and resistance (FBR) are associated to each direction. Fears of compassion refers to considering compassion as something weak, self-indulgent, or self-pitying. Regarding blocks to compassion, they are more related to considering not having the time or resources to act with compassion in certain situations, even when the individual might have wanted to. Resistance to compassion is when one could act with compassion but chooses not to because they think it is no point in doing so (Steindl et al., 2021). To develop a compassionate mind, it is important to notice these FBRs and recognize in which direction an individual might have difficulty accessing compassion. In interventions, it is therefore crucial to let the participants reflect upon and become aware of potential FBRs and in which direction they are found as the FBR otherwise can undermine the compassion process (Kirby et al., 2019).

Gilbert et al. (2014a; 2014b) found a relationship between fear of compassion and depression and alexithymia. Thus, in the program for the present thesis, we placed the psychoeducation about the FBR at the beginning to work as effectively as possible with facing these and applying compassion toward the difficulties that might be present.

Figure 1

The flow of compassion: giving, receiving and self-compassion.

1.8   SELF-CRITICISM

CFT was initially developed for individuals with high levels of shame and self-criticism. Shame is a common factor in many mental ill-health diagnoses, and people who have higher levels of self-criticism and shame have been shown to have inferior outcomes in common therapies (Enns et al., 2002; Rector et al., 2000). Self-criticism is a strategy that heightens a person's awareness of social norms and prompts them "make things right" so that they will be accepted by others. From an evolutionary perspective, it is a threat to our survival to be left outside the group. Therefore, the body reacts to self-criticism as an internal threat, which means it activates the body's stress system and prepares and individual to act. Example of self-critical inner voice include, "You are so stupid"; "You never do anything right"; "You will never be able to get a job"; "Nobody would want to be with you because you are so ugly"; and "You are running so slow"; and "Everyone else here is so much better than you are" (Longe et al., 2010). Shame is also commonly present together with an experience of lacking feelings of internal safety (Gilbert, 2009; 2019a). Being in a state of feeling unsafe can cause many stress-related problems. Another problem is that such people often also find self-warmth and self-acceptance difficult to access within themselves; they find it frightening to experience self-compassion or receive compassion from others. A key insight in CFT is that besides understanding the function of alternative thoughts, the tone of one's internal voice must be compassionate. If it is aggressive and harsh, it creates a stress response in the body. Being self-critical is therefore similar to having chronic stress. The solution is both to create a more compassionate self-talk via self-reassurance and adopting a self-soothing tone instead of being hard on oneself (Gilbert & Procter, 2006) and to resist self-attacks by increasing self-soothing (Kelly et al., 2009). Psychoeducation about self-criticism emphasizes that this self-criticism is often rooted in

something that is important to us, and this reframing can be associated with the stress theories mentioned in section 1.10.

1.9 EMOTION-REGULATION

In compassionate mind training, the three-circle model explains how to sit with difficult emotions and learning to know the function of each emotion. The three-circle model is a key element of CFT, as shown in the Figure 2. The model depicts three emotional systems: (a) threat, (b) drive, and (c) soothing. Each system is linked to certain types of emotions, thoughts, and behaviors. The drive and threat systems are both linked to the sympathetic nervous system, and the soothing system is linked to the parasympathetic nervous system. Individuals with stress-related symptoms or mental ill-health can have trouble moving between the systems in a balanced way. They often have difficulty accessing the soothing system to down-regulate their difficult emotions (Gilbert, 2010b; Gilbert, 2015; Schanche et al., 2011). This model is rooted in evolutionary theory and highlights that our emotions have enabled us to survive and reproduce. Attachment theory and social psychology provide a broader understanding of why we think, feel, and act the way we do. This model is part of all RCT studies in this thesis.

Figure 2

Three-circle model: the functions of emotions.
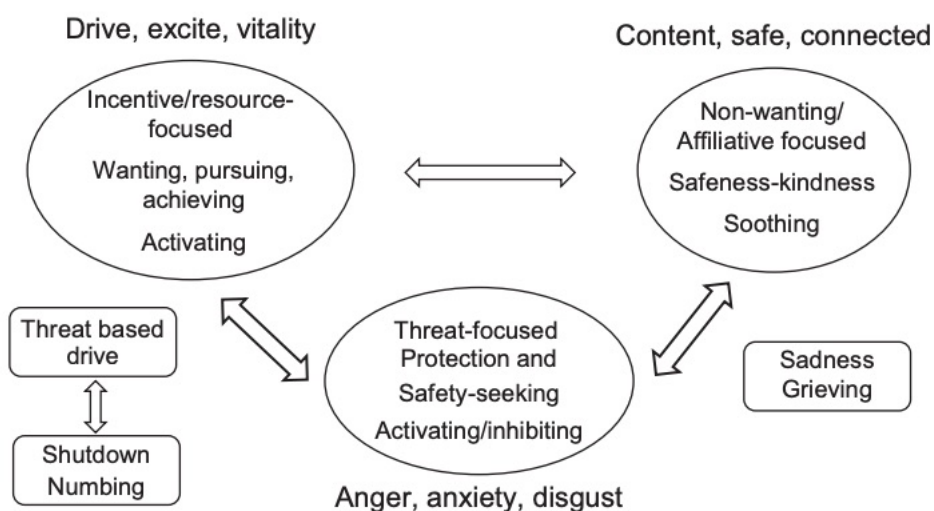
Note: Reproduced with permission from Routledge.

1.10 THE STRESS CONCEPT

All studies included in this thesis have stress level as an outcome measure, and all interventions were based on the perspective of stress discussed in this section. The

definition of stress has changed over time due to the development of experimental methodology and theoretical considerations. Stress has been described as a "biological response" in the body to any demand of change; when something suddenly happens, an acute stress response is activated in the body. Cannon (1929) described this as the "fight-or-flight" response. Selye (1936) proposed that stress could trigger a general adaptation syndrome, which describes how stress is activated in three phases when facing a change: (a) alarm, (b) resistance, and (c) exhaustion. Another theoretical development focuses on the cognitive aspects of stress (i.e., when an individual perceives that the demands from external situations are beyond their coping capacity; Lazarus & Folkman, 1984). Further, the expectancy of coping focuses on how stress arises when there is a discrepancy between one's goal and one's reality. The individual can then use different coping styles, including helplessness, hopelessness, and overcoming, to deal with the discrepancy. This theory is called the cognitive activation theory of stress (CATS; Ursin & Erikson, 2004:2010). If someone believes they have the resources to manage the stressful situation, the stress does not affect the body in a negative way. However, when someone believes the opposite, then the stress has a negative impact on the body. Recently, Brosschot et al. (2018) proposed that *"a stress response arises when an individual perceives the environment as unsafe"*. The rationale behind this theory is that our minds always are searching for signs of safety, and it is called the generalized unsafety theory of stress (GUTS; Brosschot, et al., 2018).

As can be noted in these theories, stress can be framed in many ways. It is important to emphasize that stress includes both physiological and psychological components, and how it is exhibited depends on the individual's coping strategy and the type of stressor involved. In this thesis I have focused on the psychological components of stress. Both acute and chronic stress can initiate and increase both mental and somatic ill-health (Grossi et al., 2015; Brotman et al., 2007). These types of stress can lead to e.g., reduced life satisfaction and working capacity, respectively (Zuzanek, 1998).

In the workplace context, Karasek and Theorell (1990) have proposed a job-demand-control-support model, which includes implications for employees' stress and mental health. The model highlights the various work-related circumstances that can cause stress. For example, time pressure and conflicting demands, low levels of own control/low decision breadth in one's work, and low levels of social support can all increase stress levels. This model has been important for understanding causes of stress-related illnesses at work. Earlier research on this model has shown an increased risk for depression and stress-

related problems such as fatigue syndrome, and for long-term sick leave (SBU, 2014). Increases in distress and mental ill-health have also been observed among individuals who hide or avoid displaying their emotions at work (Norlund, 2011).

The models/definitions of stress can be applied on the three-circle model (Figure 2) from compassionate mind training. The threat system is activated when facing a threat or change of some sort and when we are ruminating or stuck in self-criticism. The drive system is associated with the stress response when we think we can handle a stressful situation. Then the stress does not take a negative toll on our bodies. It is possible to downregulate one's stress level by activating the safeness/soothing system in the three-circle model, the function of which is explained by GUTS (Brosschot, 2018).

1.11 PHYSIOLOGY IN COMPASSIONATE MIND TRAINING

An important part of compassionate mind training is regulating the body's physiological state. Stressed people often tend to be more in the "sympathetic state," which can result in stress-related problems if not balanced with activation of the parasympathetic branch of the autonomous nervous system. A practice used when starting to develop a compassionate state of mind is the soothing breathing rhythm. It involves breathing in for five counts and then breathing out for five counts or making the exhale longer than the inhale. This way of breathing impacts heart rate variability (HRV) and creates physiological and psychological well-being. HRV is a physiological phenomenon increasingly being studied in compassionate mind training research as a means to understand the balance between the sympathetic nervous system and the parasympathetic nervous systems and the connection to psychological well-being (Kirby et al., 2017b). HRV can be described as the fluctuations of the interval length between the heartbeats. Individuals with a high HRV tend to be better at regulating their emotions, behavior, and attention and tend to help others in need (Burg et al., 2012; Kogan et al., 2014). "The mind slowing down and the body slowing down" is a guiding sentence that Gilbert often uses and now has become an essential part of compassionate mind training (personal communication, Mars 8, 2022). The compassionate mind training program in this thesis, at the beginning of the imagery practices, when settling in, has included this slow and deeper breathing.

It is important to remember that compassion is a dynamic concept associated with strength and courage; therefore, it should not exclusively be associated with slow and soft movements and a calm state of mind (Di Bello et al., 2021). Respiratory sinus arrhythmia

(RSA) is a phenomenon resulting from the relationship between breathing and heartbeats, where the heart rate slows down during exhalation and increases during inhalation (Ludwig, 1847). This is often described as mirroring the vagus tone and is impacted by practices such the breathing exercises done in compassionate mind training. How we are breathing depends on whether we are in our threat, drive, or safeness mode. The compassion programs contains exercises and strategies to stimulate the caregiving system to create a physiological condition of interpersonal safeness. The vagal nerve is activated when we feel connection to others and feel safe. A large part of the compassionate mind training is focusing on learning to make ourselves feel safe both in cognitive practices and via guided meditations. The vagal nerve is also active when we experience extreme fear and can help us by making us faint, displaying a "playing dead" reaction. It is called "the wandering nerve" because it travels from the neck down through many organs and ends in the lower stomach (Berthoud et al., 2000). It reaches the ears, the throat, the heart, the lungs, and the intestines, which is why many individuals report stress-related problems connected to these areas. When they balance the nervous system by activating their parasympathetic system, their stress lowers. Kim et al. (2020) found an increase in HRV after practicing compassion meditation. Matos et al. (2017a) conducted a RCT in which they examined a 2-week intervention of practicing compassionate mind training exercises compared with a waitlist control group. The participants were college students and in the general population. The results showed a significant improvement in HRV in the experimental group but not in the control group. In another study on college students the results showed that the higher scores on Neff´s self-compassion scale (SCS) predicted higher levels on resting vagally mediated heart rate variability (vmHRV; Svendsen et al., 2016). HRV has furthermore been shown to be lower in patients suffering from mental ill-health such as anxiety, depression, and stress (Alvares et al., 2016; Gorman & Sloan, 2000; Kirby et al., 2017b; Kim et al., 2018; Steffen et al., 2021).

1.12 COMPASSION IN ORGANIZATIONS

There are some differences in applying compassion vs. self-compassion in work organizations, and therefore self-compassion is described separately in a paragraph. When employees are suffering in various ways and this is not addressed or resolved, it can be costly for an organization. Conversely, understanding how to use compassion to transform suffering in the workplace into hope and positive relationships may enrich the work environment (Dodson & Heng, 2022). A framework to describe how compassion can be trained in an organizational setting involves three aspects: (a) interpersonal work, (b)

narrative, and (c) organizing. In this framework, supportive interpersonal relations are crucial. A way of fostering this helpfulness could be the psychological concept of benevolence, which is defined as sense of being able to give out of goodwill to others (Martela & Ryan, 2015, 2020) and as having kindness and wanting to serve and care for others (Willison, 2020). In this way, being benevolent can enhance the establishment of a compassionate organizational culture. Further, the use of narratives as a method to understand and strengthen workplace compassion creates the organization's identity by building stories. An organization can develop processes and routines that support compassionate action, and this framework gives a sense of how compassion can be developed in a workplace (Frost et al., 2006).

Lilius et al. (2008; 2011) aligned with Frost et al. (2006) and introduced the perception of compassion on a collective level within an organization. This added to the work of Frost et al. by framing compassion as a narrative and an action that can be strengthened by rules and routines. Compassion is described as both a motivation to increase one's own happiness and well-being and helping others to experience happiness and flourish. Acting with a compassionate attitude can lead to enhanced health and a mindset that is open to new possibilities and learning, whereas a lack of compassion can result in a person's being defensive and having reduced cognitive functioning. Compassion has been argued as a force that can enhance adaptability by creating norms and relationships with a foundation of caring (Boyatzis et al., 2012).

1.13 BENEVOLENCE

Within the field of research on psychological well-being, the concept of benevolence has recently emerged, and a way of describing benevolence is "the sense of being able to give" (Martela & Ryan, 2015 p.1). Benevolence belongs with similar concepts such as altruism and prosocial behavior and has been shown to be associated with enhanced well-being (Martela & Ryan, 2015, 2020). The satisfaction that comes with being benevolent is connected to improvements in mood and is in line with the compassion research that shows that being compassionate generates well-being and a buffer to stress (Cosley et al., 2010). Benevolence and compassion are different, however, as the former is connected to one's own experience of being a positive force in the world and that this can be executed whenever. The latter is only needed when suffering is present. In study IV, we investigated the associations between benevolence, self-compassion, stress, and mental ill-health (i.e.,

anxiety and depression) because benevolence is quite a new concept within human flourishing research.

1.14 SELF-COMPASSION IN ORGANIZATIONS

Self-compassion has been described as a resilience strategy and facilitates psychological functioning and well-being in organizations during challenges (Dodson & Heng, 2022). In this thesis self-compassion is evaluated with a questionnaire based on Neff's (2003a) definition, in which the three components of self-compassion, (mindfulness, common humanity, and self-kindness) are measured and compared to other psychological outcome measures such as stress, anxiety, alexithymia, and depression. In Figure 3, a conceptual model of self-compassion within organizations as a dynamic and unique process explains how self-compassion is similar to compassion toward others. The four steps in the model come from Worline and Dutton (2017), who definitions were developed from Kanov et al. (2004, 2017). In the model, the original three components of self-compassion are described in terms of noticing, feeling, and acting.

Figure 3

A model of self-compassion as a process in organizations.
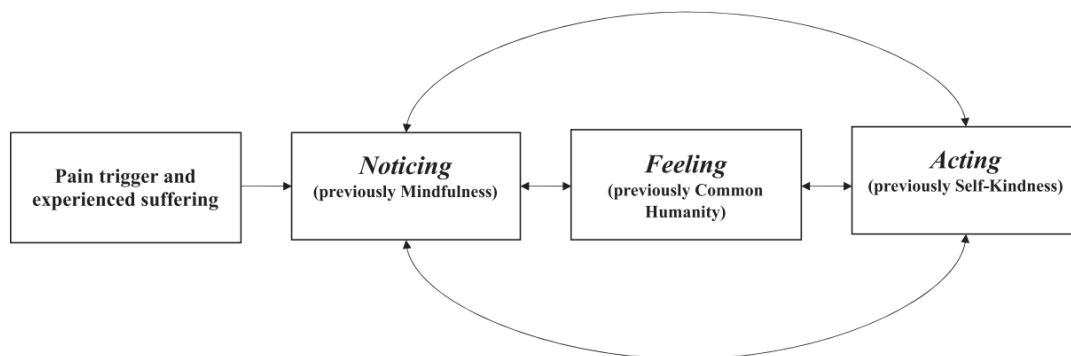
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Several studies over the last 20 years have explored how self-compassion has impacted organizations because it may help employees to handle setbacks, difficult emotions, and personal life difficulties that spill over to the workplace. Additionally, Rhee et al. (2017) demonstrated that the relationship between coworker's incivility and job performance was affected by an employee's level of self-compassion. Pinard et al. (2020) investigated how a self-compassion intervention could affect the relational and affective-motivational factors in the workplace. The authors argued that self-compassion enhanced an individual's sensitivity to social cues of warmth from colleagues, which created a reciprocal positive

spiral of warm behaviors and inclination to be helpful to others. The study recruited employees from nine Canadian organizations across various industries to answer two self-reported questionnaires with 3 months between measurements. The results showed that the team members' relational exchange quality and compassion toward others through social safeness had significantly increased. Abaci and Ardi (2013) studied the relationship between self-compassion and job satisfaction and found a moderate positive correlation. Babenko et al. (2019) categorized professional well-being in three dimensions: (a) work engagement, (b) exhaustion, and (c) professional life satisfaction. They found professional well-being was higher among physicians who scored higher on self-compassion than physicians who exhibited less compassion toward themselves. Besides employee compassion training, some studies have investigated leaders' self-compassion. Paakkanen et al. (2021) found that leaders' levels of self-compassion increased after training in emotion-regulation skills. This is an important observation because some participants in study III recommended that their leaders go through compassionate mind training and that the whole organization should use compassionate mind training.

As shown in Figure 3, one approach to exploring self-compassion at work is identifying antecedents on individual and contextual levels and outcomes on intra- and interpersonal levels. Psychological research on self-compassion has considered individual characteristics, such as personality and attachment style, which can impact self-compassion levels (Dodson & Heng, 2022). An individual's upbringing and temperament affect their ability to learn and to engage in self-care and regulate their emotions. Organizational support and workload also influence access to self-compassion. Moreover, an individual's level of self-compassion has an intrapersonal level on factors such as mental and physical health and resilience. It also relates positively to job satisfaction and job performance (Dodson & Heng, 2022). On an interpersonal level, self-compassionate employees try not to harm their relationships at work and show relationship skills such as compromising and helping behavior (Dodson & Heng, 2022). Henshall et al. (2018) found that self-compassionate employees are more likely to show compassion toward others at work. Anjum et al. (2020) found that employees with high levels of self-compassion tend to experience less emotional exhaustion. Relatedly, self-compassion has been shown to protect and buffer against compassion fatigue (e.g., as the cost of caring; Duarte & Pinto-Gouveia, 2016; Figely, 1995) and enhance compassion satisfaction (Alkema et al., 2008).

Figure 4

A model of the antecedents and impacts of self-compassion in organizations.
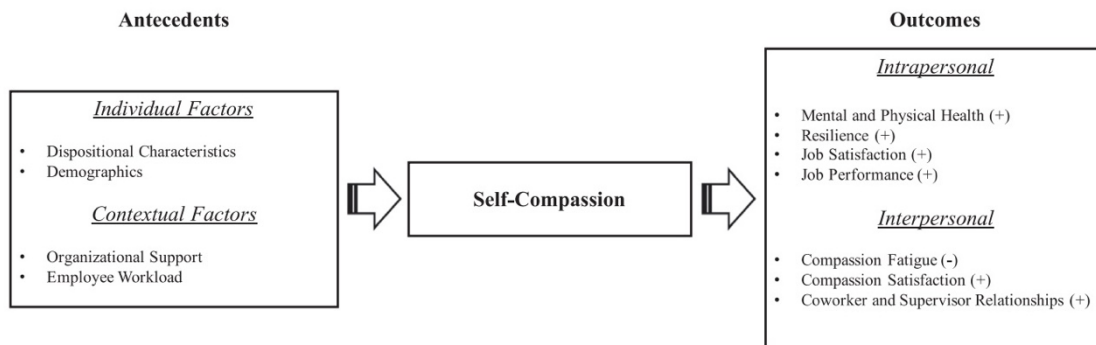
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1.15 PRIOR TREATMENT PROGRAMS FOR STRESS-RELATED MENTAL ILL-HEALTH

Various treatment programs to decrease stress-related problems and mental ill-health (e.g., depression and depression) have been evaluated regularly due to the continuous development of new technologies and knowledge. From a short historic perspective, both psychological programs and other strategies (e.g., mindfulness, physical exercise; see below for more information) have been examined as alternatives or complements to medication to alleviate mental ill-health. Acceptance and commitment therapy (ACT) is a psychological method that showed good results and is commonly used to address stress-related problems in both primary care and occupational health care (Hayes et al., 2006). Further, affect-focused interventions have led to improvements in stress levels (Bergdahl, 2005). Online cognitive behavioral therapy (CBT) for stress-related problems has also shown promising results (Lindsäter, 2018) as well as strategies to focus on the recovery process from stress (Almén et al., 2020). In addition, various mind-body exercises are becoming more commonly used (e.g., yoga, mindfulness to reduce anxiety and depression; Cramer, 2018; 2013). Moreover, physical exercise is one of the earliest recommendations to alleviate work stress (Mücke et al., 2018).

1.15.1 Control groups

In a meta-analysis by Kirby et al. (2017a), the authors concluded that future studies on compassionate mind training should use active controls. In this thesis, three studies used active control groups (data collection was done in 2015, 2016, and 2018). In studies II and III, physical exercise and mindfulness were chosen to constitute active control groups due

to their demonstrated effects on stress-related problems and mental ill-health, such as anxiety and depression.

1.15.2 Mindfulness

The second study in this thesis had mindfulness as an active control group. Practicing mindfulness has been shown to reduce stress and poor mental health such as anxiety and depression (Goldberg, 2022; Goldberg et al., 2018). Mindfulness can be described as "intentionally bringing one´s attention to one's own internal and external experience with a nonjudgmental attitude" (Williams & Kabat-Zinn, 2013). A helpful definition of mindfulness is "the awareness that emerges through paying attention, on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (Kabat-Zinn, 2003, p. 145).

Mindfulness-based stress reduction (MBSR) is a program created by the researcher and ancient wisdom practitioner, John Kabat-Zinn, with the aim to work with stressful thoughts, emotions, as well as with tensions in the body to reduce stress and improve mental health. Research on mindfulness has increased during the last 20 years. Training the mind to be present helps the wandering mind to be still; if successful, negative thoughts and rumination will appear less frequently (Hölzel et al., 2011). Having negative thoughts and getting stuck in rumination make many individuals suffer. Mindfulness has been suggested to be a prerequisite for compassion and self-compassion (Neff & Germer, 2013) as if one is aware of where one's mind is directed it is much easier to notice where there is a need for compassion. Another reason for training the mind to be present and still is that a wandering mind is associated with lower levels of happiness (Killingsworth & Gilbert, 2010). As noted above, mindfulness is a good choice of practice to reduce stress-related problems and mental ill-health (e.g., depression and anxiety symptoms) and has been shown to increase self-compassion (Conversano et al., 2020).

1.15.3 Physical exercise

Study III used physical exercise as an active control. Physical exercise is a well-known intervention to reduce stress-related problems and to increase mental health on psychological, physiological, and metabolic levels (Mücke et al., 2018; Tsatsoulis & Fountoulakis, 2006). The positive effect of physical exercise on mental health has been shown in several studies, especially regarding decreases in depression (Josefsson et al., 2014) and in burnout (Lindwall et al., 2014; Naczenski et al., 2017). No prior study, to our

knowledge, compared compassionate mind training with physical exercise. Therefore, we found it to be of interest as many individuals with mental ill-health or exhaustion syndrome might not be able to perform regular physical activity, and compassion training thus might be an alternative to physical exercise to reduce stress and mental ill-health.

1.15.4 Affect-focused training

The first study in my doctoral project compared compassionate mind training to affect-focused training. Bergdahl et al. (2005) examined a group intervention in a nonclinical sample with high levels of stress and showed a decrease in stress and psychological symptoms. A meta-analysis including 28 RCTs on experiential dynamic therapy, which emphasizes both feeling and expressing affects, showed reduced anxiety and depression (Lilliengren et al., 2016).

1.16 SUMMARY

This background provides a frame of reference for the four papers described in this thesis. This doctoral project was focused on university students and employees at their workplaces. The personal and economic cost of suffering due to stress and mental ill-health affects all aspects of society. Therefore, it is important to identify new treatments and interventions that can increase well-being and improve coping strategies.

This thesis focuses on the psychological concepts of self-compassion, benevolence, stress, anxiety, and depression. Prior compassionate mind training research has been conducted on both clinical and nonclinical populations, but the use of active control groups has mainly been lacking. The difference between CFT and compassionate mind training is that the latter is not a therapy; instead, it focuses on psychoeducation and skills training (e.g., visualization to train the mind).

2   AIMS OF THE THESIS

2.1   OVERALL AIMS

The overall aim of this thesis was to develop a compassion program and evaluate it in randomized control trials on various target groups.

2.1.1   Study I

Andersson, C., Støre. S. J., Gunnarsson, M., Säldebjer, H., Bergsten Lindert, K &., Osika, W. The effects of Compassionate Mind Training on perceived stress, anxiety and depression in university students – A randomized controlled trial. (Submitted to Anxiety, Stress, & Coping)

Objective: To investigate the effects of a five-week compassionate mind training intervention on perceived stress, symptoms of anxiety and depression, and self-compassion compared with an active control group.

Research questions: Does compassionate mind training have effects on perceived stress, symptoms of anxiety and depression, and self-compassion compared with the active control group?

Hypothesis: The hypothesis was that the compassionate mind training would have beneficial effects on the outcome measures compared with the active control group.

2.1.2   Study II

Andersson, C., Bergsten, K. L., Lilliengren, P., Norbäck, K., Rask, K., Einhorn, S., & Osika, W. (2020). The effectiveness of smartphone compassion training on stress among Swedish university students: A pilot randomized trial. *Journal of Clinical Psychology*, 10.1002/jclp.23092. https://doi.org/10.1002/jclp.23092

Objective: To investigate the efficacy of smartphone compassion training compared with an active control group receiving mindfulness training and a passive waitlist control group.
Research questions: Does a smartphone application, consisting of a psychological program focusing on compassion training, have a positive effect on self-compassion, perceived stress, alexithymia, and global distress among university students suffering from stress?

Hypothesis: The hypothesis was that the compassionate mind training application would be more effective on the outcome measures perceived stress, self-compassion, alexithymia and global distress than the active control group and the waitlist control group.

2.1.3 Study III

Andersson, C., Mellner, C., Lilliengren, P., Einhorn, S., Bergsten, K. L., Stenström, E., & Osika, W. (2021). Cultivating Compassion and Reducing Stress and Mental Ill-Health in Employees – A Randomized Controlled Study. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2021.748140

Objective: We investigated the effects of a six-week psychological intervention using compassionate mind training on perceived stress, mental health, and self-compassion compared with an active control group doing physical exercise.

Research question: Is there a difference between a psychological intervention based on compassionate mind training, compared with an active control group treatment program of physical exercise, on employees' perceived stress, mental health, and life satisfaction?

Hypothesis: We hypothesized that the compassion mind training intervention would reduce employee perceived stress, anxiety, and depression, and would increase life satisfaction, at similar, or higher, levels to those brought about by physical exercise. We also hypothesized that the compassionate mind training intervention would increase self-compassion at higher levels than those brought about by physical exercise.

2.1.4 Study IV

Andersson, C., Stenfors, U. D. C., Lilliengren, P., Einhorn, S., & Osika, W. (2021). Benevolence – Associations with Stress, Mental Health and Self-Compassion at the workplace. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2021.568625

Objective: To examine the associations between benevolence, stress, mental health, self-compassion, and life satisfaction in two workplace samples.

Research questions: Is there a relationship between levels of benevolence, perceived stress, emotional exhaustion, depression, self-compassion, and satisfaction with life?

Hypothesis: We expected benevolence to be negatively associated with measures of stress and mental health and positively associated with self-compassion and satisfaction with life.

3 MATERIALS AND METHODS

3.1 STUDY I

3.1.1 Method – Design, participants, and procedure

Study I (Andersson, C., Støre, S., Gunnarsson, M., Säldebjer, H., Bergsten Lindert K., & Osika, W. (submitted) was a randomized controlled trial. A total of 55 university students (mean age = 26) were randomized to compassionate mind training (n = 28) or to affect-focused training (n = 27). The data collection was conducted in Uppsala, Sweden, in 2015.

3.1.2 Measures and assessment

The data collection was done on two occasions, one week before the intervention (before the randomization was conducted) and post-intervention (at the last session). The study was approved by the Swedish Ethical Review Authority (Dnr: 2013/153231/3) and registered at ISRCTN13468533 retrospectively. Participants were provided an informed consent document and demographic questions such as age, semester, and university program. Self-reports included in the paper are the following: Self-Compassion Short-Form (SCS-SF), Hospital Anxiety and Depression Scale (HADS), and Perceived Stress Scale (PSS-14). An outline of the five-week compassionate mind training intervention and affect-focused training is described in the submitted paper.

3.1.3 Statistical analysis

All data were analyzed using the SPSS.28 (IBM) and with intention to treat principle (Hollis & Campbell, 1999). A p-value of <0.05 was considered statistically significant. The statistical analysis used to analyze the outcome measures was linear mixed-effects regression model (Heck et al., 2014). Group and measurement time points were set as fixed effects, and participants as random effects. The default covariance structure for random effects was used ("variance components"), in line with Kincaid (2005). The linear mixed-effects regression models were estimated with restricted maximum likelihood estimation (REML), which is the default in SPSS, and which is also recommended for small samples (Heck et al., 2014), like the sample in the current study. Also, the models are based on the assumption that missing values are missing at random (MAR; Enders, 2011).

3.1.4 Results

Compassionate mind training was not found to effectively reduce perceived stress or anxiety in university students compared with the active control group. The difference

between the groups was statistically significant regarding the measure of depression (p = 0.02) in favor of the intervention group. Regarding self-compassion, the difference between the groups was not statistically significant postintervention.

3.1.5 Discussion and conclusion

The main findings in this study were that the compassionate mind training did not effectively decrease perceived stress or anxiety compared with an active control group. For the intervention group, the depression score from the hospital anxiety and depression scale decreased with -1.56 points post-intervention compared with the active control group. The difference was statistically significant, representing a small effect size (d = .40). The baseline depression levels were, however, low. In Mascaro et al. (2016) medical students were trained in compassion, and the results suggested that the students with highest levels in depression symptoms at baseline showed relatively more self-compassion after the training than did students with lower levels of depression symptoms at baseline.

The significant improvements in depression are also in line with Hall et al. (2013) who found a statistically significant negative relationship between self-compassion and depression symptoms in university students. The nonsignificant results on perceived stress are in line with previous studies (Jazaieri et al., 2013).

Regarding the population of university students, future studies on compassionate mind training should conduct a thorough screening of participants to ensure that they meet the prespecified eligibility criteria and to choose outcome measures wisely. In addition, an important factor is that due to studies' low power more rigorous studies need to be performed to make broader conclusions.

3.1.6 Strengths and limitations

The first strength of the current study was the novelty of the intervention study because prior research showed the positive relationship between mental health and self-compassion (MacBeth & Gumley, 2012) and that self-compassion is a strategy to deal with academic failure (Neff et al., 2005). Based on that, it was of interest to test compassionate mind training on a Swedish sample of university students who faced those kinds of problems. A second strength was the randomized controlled design, and a third strength was that the allocation to groups was done after the baseline measurement. Limitations in this study were the small convenience sample and an overrepresentation of women. Moreover, the attrition rate was over 20%. The recruitment period was short, and participants had to participate on two dates for data collection, which might have impacted the level of

participants. Even though the PSS-14 is a widely used questionnaire to measure perceived stress, it might have been a better choice to use some other measurement to capture stress during a shorter timeframe (e.g., a VAS question on stress level) to capture levels of stress or to use some other parameter (e.g., HRV or cortisol level via saliva sample) for a biological measure as a complement to self-reports. Unfortunately, no long-term follow-up was performed.

3.2 STUDY II

3.2.1 Method – Design, participants, and procedure

In study II (Andersson, Bergsten, Lilliengren, Norbäck, Rask, Einhorn, & Osika, 2020) a 6-week smartphone-based compassion mindset training intervention (n = 23), was compared with an active control group smartphone-based mindfulness training (n = 19) and a passive control group waitlist (n = 15). The target group was university students with self-defined elevated levels of stress and/or self-criticism. Level of self-criticism was measured by the self-compassion scale (Neff, 2003b) but was not used to exclude any participants. The students had to study on at least 75% and to have a smartphone or a tablet. Most of the participants were studying on their third or fourth year. A various university program was included, see an overview of the programs below table 1.

Table 1
Demographic characteristics of the participants at baseline.

	Overall N = 57	Intervention N = 23	Active control N = 19	Passive control N= 15
Variable	Mean (SD) or % (n)	Mean (SD) or % (n)	Mean (SD) or % (n)	Mean (SD) or % (n)
Age, in years	25.19 (5.05)	23.70 (2.99)	25.89 (5.98)	26.60 (5.96)
Gender				
Female	68.42%(39)	43.48% (10)	89.47% (17)	80.00%(12)
Male	31.58%(18)	56.52% (13)	5.26% (1)	20.00% (3)
Other	0.00% (0)	0.00% (0)	5.26% (1)	0.00% (0)

Subject of study				
Agricultural	5.26% (3)	4.34% (1)	5.26% (1)	6.67% (1)
Teacher education	3.51% (2)	0.00% (0)	5.26% (1)	6.67% (1)
Biology science	3.51% (2)	0.00% (0)	5.26% (1)	6.67% (1)
Biomedical analyst	1.75% (1)	0.00% (0)	5.26% (1)	0.00% (0)
Civil engineer	8.77% (5)	13.0% (3)	0.00% (0)	13.3% (2)
Computer science	1.75% (1)	4.34% (1)	0.00% (0)	0.00% (0)
Animal care SLU	5.26% (3)	0.00% (0)	5.26% (1)	13.3% (2)
Business economics	7.00% (4)	8.70% (2)	10.5% (2)	0.00% (0)
English	1.75% (1)	0.00% (0)	5.26% (1)	0.00% (0)
History	3.51% (2)	4.34% (1)	5.26% (1)	0.00% (0)
Law program	5.26% (3)	4.34% (1)	0.00% (0)	13.3% (2)
Systems science	1.75% (1)	0.00% (0)	5.26% (1)	0.00% (0)
Culture/society	3.51% (2)	4.34% (1)	5.26% (1)	0.00% (0)
Medical school	7.00% (4)	8.70% (2)	10.5% (2)	0.00% (0)
Landscape architect	1.75% (1)	0.00% (0)	5.26% (1)	0.00% (0)
Leadership coaching	1.75% (1)	4.34% (1)	0.00% (0)	0.00% (0)
M.Sc Strategic plan	1.75% (1)	0.00% (0)	0.00% (0)	6.67% (1)
HR program	3.51% (2)	0.00% (0)	0.00% (0)	13.3% (2)
Political science	5.26% (3)	4.34% (1)	5.26% (1)	6.67% (1)
Psychology program	17.5% (10)	26.1% (6)	10.5% (2)	13.3% (2)
Social science	1.75% (1)	4.34% (1)	0.00% (0)	0.00% (0)
Veterinary SLU	5.26% (3)	4.34% (1)	10.5% (2)	0.00% (0)
Other, UU	1.75% (1)	4.30% (1)	0.00% (0)	0.00% (0)
Study pace				
75%	1.80% (1)	0.00% (0)	0.00% (0)	6.70% (1)
100%	93.0% (53)	91.3% (21)	100% (19)	86.7% (13)
150%	1.80% (1)	0.00% (0)	0.00% (0)	6.70% (1)
Missing	3.50% (2)	8.70% (2)	0.00% (0)	0.00% (0)
University semester				
1	1.80% (1)	4.30% (1)	0.00% (0)	0.00% (0)
2	24.6%(14)	21.7% (5)	31.6% (6)	20.0% (3)
3	7.00% (4)	8.70% (2)	10.5% (2)	0.00% (0)
4	14.0% (8)	13.0% (3)	10.5% (2)	20.0% (3)
5	5.30% (3)	0.00% (0)	5.30% (1)	13.3% (2)
6	12.3% (7)	8.70% (2)	15.8% (3)	13.3% (2)
7	10.5% (6)	17.4% (4)	0.00% (0)	13.3% (2)
8	7.00% (4)	8.70% (2)	0.00% (0)	13.3% (2)
9	7.00% (4)	4.30% (1)	15.8% (3)	0.00% (0)
10	8.80% (5)	8.70% (2)	10.5% (2)	6.70% (1)
11	1.80% (1)	4.30% (1)	0.00% (0)	0.00% (0)

No compensation was given to the participants except that they were given access to the programs via mobile applications within the year if they completed the program. In the flowchart below (Figure 1) shows participant allocation. The control group was a passive waitlist, and the active control group was a smartphone mindfulness training.

Figure 1

Flowchart of participation, as well as attrition, for all three groups participating in the study.
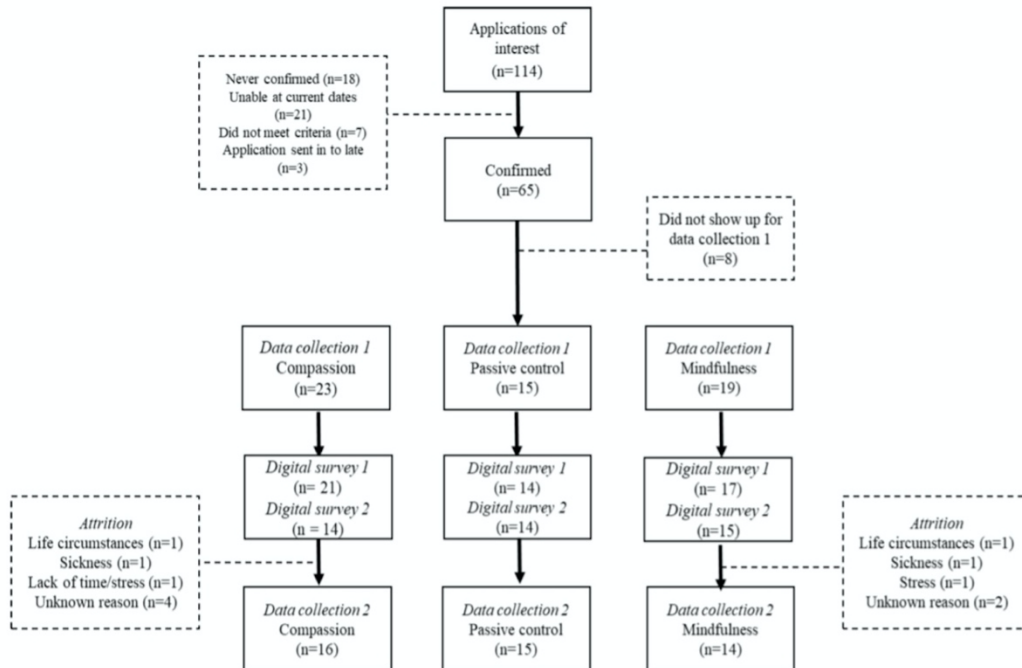
3.2.2 Measures and assessment

The primary measures were the Self-Compassion Scale Short-Form (SC-SF) and the Perceived Stress Scale (PSS-10), and the secondary outcomes was measured using the Toronto Alexithymia Scale, (TAS-20) and the Clinical Outcomes in Routine Evaluation-Outcome Measure (CORE-OM). Participants were encouraged to use the program for 10-15 minutes per day, for six weeks. The time each study participant spent with the exercises in the apps was also measured by self-report at the end of the study. The participant was asked to fill in a question about estimated time they had used the app: (1) many times per day, (2) one time daily, (3) every other day, (4) two times a week, or (5) once a week or more seldom.

The participants were randomized into the three groups; by coincidence it had a skewed distribution for gender, 13 (56.5%) of the participants in the compassion mindset group were men, 1 (5.6%) was a man in the mindfulness group, and 3 (20%) were men in the waitlist control group. To avoid this, the randomization could have been done before the assessment so the participants could have been matched. This distribution may affect the

generalizability of the results. All the information and instructions were standardized to control for experimenter effects. Four different sets were made via random.org to control for the order effect of the questionnaires. Also, both of the smartphone applications were tested by three university students 1 week before the first assessment. The procedure at the preassessment was tested by two university students to estimate time and to see if any of the written instructions needed to be clarified. One reminder at each time was sent out in conjunction with the digital assessment at weeks 2 and 4. The participant who had showed interest in the study but did not show at the first assessment occasion was given a second opportunity a week after the first occasion, but that was cancelled because no one signed up for it. An email to remind to sign up for the final assessment was sent out with two choices. This study was approved by the Swedish Ethical Review Board in Stockholm (Dnr: 2013/1532-31/3).

3.2.3 Intervention – Smartphone application: The compassion mindset training

3.2.4 Statistical analysis

Data were analyzed with multilevel growth models (MLM; Singer & Willet, 2003) which are helpful for analyzing repeated measures. The primary outcomes of the self-compassion short-form scale (SC-SF) and perceived stress scale (PSS-14) were assessed at four time points. Secondary outcomes of the Toronto alexithymia scale (TAS-20), and the clinical outcomes in routine evaluation-outcome measure (CORE-OM) were assessed at two time

points, before and after the intervention. Regarding the secondary outcomes, an analysis of covariance (ANCOVA) was used to test for group differences at the end of the intervention. The analysis was done on completer sample so listwise deletion was used. Regarding missing data, an analysis using the last observation carried forward (LOCF) was used to impute data. Scores at week 6 were the dependent variables, and the group allocation was the independent variable. The significance level was set to $p < .05$, and all statistical calculations were performed using the SPSS v.21 (IBM) software package. Adherence to the program was measured by how often they used the application. The results are shown below.

The Compassion application: 16 participants

0st (0%) many times a day

1st (6,3%) every day

4st (25%) every other day

7st (44%) two times a week

4st (25%) once a week or more seldom

The Mindfulness application: 14 participants

1st (7%) "many times a day

3st (21%) every day

6st (43%) every other day

2st (14%) two times a week

2st (14%) once a week or more seldom

3.2.5 Results

Overall, the results of the primary outcomes showed no statistically significant differences between the compassionate mind training and the mindfulness training. Both compassionate mind training ($p < 0.001$) and mindfulness training ($p = 0.001$) increased self-compassion compared with the waitlist control group, while only compassionate mind training resulted in a statistically significant reduced stress level -0.61 per time points, ($p = 0.027$) compared with the waitlist control group. For the secondary outcomes a statistically significant effect was found on alexithymia in both groups compassionate mind training ($p = 0.001$) and mindfulness ($p= 0.030$) compared to waitlist. No statistically significant differences among the three groups were found for global psychological distress.

3.2.6 Discussion and conclusion

The findings show that compassionate mind training via a smartphone application reduced the perceived stress level with 6.7 points from (21.7-15.0), and mindfulness training reduced 5.8 points from (22.8-17.0). The mean score represented a moderate stress level on the perceived stress scale, but the students reported a self-defined high level of stress. PSS is not a diagnostic tool, and there are no established cut-off scores. Instead, scores ranging 14–26 are considered moderate stress, and the sample had scores in that range. Moreover, the PSS-10 was framed as feeling and thoughts during the past months so a more precise time frame (e.g., 1 week) would have been preferable. This difference between the student's sample of their perceived stress level is moderate when compared to the scale's levels; this information could be of interest because it leaves little room for improvement, and this could be investigated further.

The alexithymia score decreased from 47.8 to 40.7 in the compassionate mind training group compared to the 48.0 to 45.5 score in the mindfulness training group. A cutoff for alexithymia is 60, which means that the baseline score for this sample is below the cutoff score. The construct of alexithymia is associated with difficulties with an awareness of, experiencing, and expressing affects. It has been shown to indicate an increased risk for mental ill-health (Tayler et al., 1997) and associated with negative life outcomes (Franz et al., 2008). Alexithymia has a prevalence of 10% in nonclinical populations; thus, it is important to evaluate the effect of compassionate mind training on it (Taylor et al., 1997). The nonsignificant result on global distress might be due to the short length of intervention in a university context and that CORE-OM is a questionnaire normally used in therapeutic settings. Also, compassionate mind training might not be an effective method for reducing global distress.

3.2.7 Strengths and limitations

The first strength of this study was the randomized controlled trial design, with one active and one passive control group. The smartphone compassionate mind training consisting of different elements such as psychoeducation, reflection practice, breathing exercises, and guided imagery in order to cope with stress, self-criticism, and difficult feelings was considered a novel intervention when the study was conducted in 2018. In clinical psychology, online digital methods were suggested to be effective, but there was limited evidence of evaluating compassionate mind training in a nonclinical group, especially

through RCTs involving smartphone applications with active control groups on this population.

Limitations included the low power from the small sample size and the attrition rate was over 20%. Maybe if more reminder emails had been sent out to the participants to practice it might have resulted in a lower attrition rate. The initial interest came from 114 people. It could have been the requirement of attendance to two specific dates for the pre-and postmeasurement that resulted in the large decline, and the recruitment period could have been longer so as to recruit more participants. Another limitation was the possible self-selection bias in the recruitment. There was also an unequal distribution of gender. Another limitation was that adherence was measured after the intervention ended, which required the participant to remember how often they used the app; this made the answers less reliable. There was also no option for not having used the application at all, which would have been preferable. Finally, the study was not preregistered, and no long-term follow-up was done.

3.3   STUDY III

3.3.1   Method – Design, participants, and procedure

In study III (Andersson et al., 2021), participants were 49 employees from the public and private sectors. Employees with a subjective experience of work-related stress were recruited by each organization. Random allocation to two different groups was made. One group received compassionate mind training, and the other group was instructed to engage in physical exercise. The participants were randomized after the first measurement.

3.3.2   Measures and assessment

This study was a randomized controlled trial with repeated measurements pre-, post, and follow-up at 3 months. The measures included Self-Compassion Scale (SCS), the Perceived Stress Scale (PSS-14), the Hospital Anxiety and Depression Scale (HADS), and the Satisfaction with Life Scale (SWLS). The study was approved by the Swedish Ethical Review Board in Stockholm (Dnr: 2015/1589-31).

3.3.3   Control group – physical exercise

The control group was requested to engage in physical exercise during the same 6-week period as the compassionate mind training. It was no specific physical exercise the only instruction was that it should increase the heart rate, as with powerwalks, and participants could do it on their own. The participants were also instructed to perform intensive

exercise at least three times weekly for 30 minutes during each of the 6 weeks, or up to 2 hours each week (Yang, 2019). Postintervention, the participants gave either written or oral information (number of occasions and dates) on how much physical exercise they had engaged in during the period.

3.3.4 Statistical analysis

Mixed effect regression analysis was applied to account for individual changes over time and test for differences in change rates between the groups (Singer & Willett, 2003). The variables were tested for normality and met the criteria. The data were analyzed on an intention-to-treat basis (Hollis & Campbell, 1999), and the missing observations were treated under the less restrictive assumption that data were missing at random (Little & Rubin, 2002). The models were estimated using restricted maximum likelihood due to the small sample (Enders, 2011). The significant level was set to $p < .05$ and no correction for family-wise error rate (FWER) was performed. All statistical calculations were conducted in SPSS v.20 (IBM).

3.3.5 Results

A finding in this study was that only the compassionate mind training showed a statistically significant and moderate increase in self-compassion at 3.82 points ($p = 0.03$, Cohens $d = .51$ at follow up). No other significant effect on the other outcome measures was found between the groups. Both groups demonstrated a statistically significant within-group decrease over time in perceived stress ($p = 0.04$, Cohen's $d = -0.46$) and anxiety and depression ($p = 0.02$, Cohen's $d = 0.33$) There were no statistically significant effect on the outcome measure life satisfaction in any of the groups ($p > 0.53$).

3.3.6 Discussion and conclusion

This study provides an evaluation of compassionate mind training compared to physical exercise, and no statistically significant differences were found between groups on symptoms of anxiety, depression and perceived stress or satisfaction with life. However, a statistically significant effect was found on self-compassion in the compassionate mind training group. Considerations needs to be taken regarding the small sample and the low power, and also that the statistical analysis chosen did not correct for family wise error rate (FWER), so the results should rather be regarded cautiously than promising. We might have exaggerated the importance of the results in the paper. We choose to not correct for multiple analysis, due to the explorative character of this quite new intervention, with a

small sample size. The nonsignificant result for life satisfaction might be because it measured global satisfaction with life but mainly from a private lens and not from a work-life perspective. This contrasts to earlier research showing that high levels of self-compassion have a positive effect specifically on employees' professional life satisfaction. A measure that captures satisfaction with both private and work life would have been a better choice or a self-report that better captured satisfaction at work. It would be of interest in future studies to have another active control that combines both physical exercise and compassionate mind training and to include more organizational outcome measures. In sum, the results showed that compassionate mind training was not an effective method in comparison to physical exercise on perceived stress.

3.3.7 Strengths and limitations

A strength of this study was that it used physical exercise as an active control group, which has not been done before within this field of research on compassion in organizations. Comparing physical exercise with compassion training can contribute to the field of knowledge on how organizations can support their employees experiencing stress-related problems by giving more alternative strategies to deal with stress. Also, much of earlier research on compassion in work organizations has been done in the health care environment, so conducting a study in an organization in the public and private sectors is an important contribution to the field.

Limitations in this study included that the sample size was small, the recruitment was conducted by the respective human resource departments, and more detailed information on how much the participants in the control group had exercised and what kind of exercises they had done was lacking. The participants were asked to record their amount of exercise by themselves, which makes it difficult to know how reliable the answers were. It would have been better if the control group had performed a physical exercise at specific times with an instructor so that the adherence could be overviewed. Specific work- and organizational-specific measures could have been included to target work-related mental ill-health. No formal investigation was made as to why more participants dropped out from the intervention group, and no comparison was done between the different workplaces. There was a larger attrition rate from the private bank SEB, which would have been good to investigate further. However, the follow up was during the summer vacation which made it difficult to reach participants. Finally, long-term follow-up would be preferable, such as after 1 year.

3.4   STUDY IV

3.4.1   Method – Design, participants, and procedure

Study IV (Andersson et al., 2021). Benevolence – Associations with Stress, Mental Health and Self-Compassion at the workplace, used a cross sectional design. Data from two separate datasets were included in this study. In the first study, 522 participants (38% female, median age = 42) were admitted from three organizations (Vinnova, Microsoft, and Vasakronan), there are no data on how the participants are allocated between the different companies. In study 2, 49 participants (96% female) were admitted from two organizations (a private bank SEB and the public organization the Swedish Social Insurance Agency). In study 2 the participants were allocated as follow; Swedish Social Insurance Agency in Sundsvall (n=19) and Haninge (n=16) and SEB, Rissne (n=14). The participants in study II had self-defined high levels of stress but no inclusion criteria regarding stress levels were applied in study 1.

3.4.2   Measures and assessment

The benevolence scale (BS) is a brief assessment of feeling benevolent, a sort of satisfaction and feeling of goodwill, which makes it important to measure in a workplace. We translated the BS from the English version because no measures of benevolence were available in Swedish. Except for self-compassion, the other self-reports used (see below) were aspects of mental ill-health (stress, exhaustion, and depression). The independent variable in the first study was benevolence, and the dependent variable was the self-report on emotional exhaustion (MBI-EE) and depressive symptoms (SCL-CD6). In the second study the independent variable was also benevolence and the dependent variables the perceived stress scale (PSS-14), the self-compassion scale (SCS), and the hospital anxiety and depression scale (HADS).

3.4.3   Statistical analysis

Bivariate Pearson *r* correlations were calculated between the different measures in the study using SPSS v.25 (IBM). Listwise deletion was applied. Due to the exploratory aim of the study, the two-way significance level was set to 0.05 without correction for familywise error rate (e.g., Bonferroni).

3.4.4   Results

In study I, benevolence was negatively correlated with emotional exhaustion (r = -.190) and depression (r = -.295), and the correlations were statistically significant. In study II

benevolence was negatively correlated with stress (r = -.392) and depression (r = -.310), and the correlations were statistically significant, whereas the correlation between benevolence and anxiety (r = -.199) was not statistically significant. Moreover, benevolence was positively correlated with self-compassion (r = .401), and the correlation was statistically significant. Satisfaction with life (r = .148) and benevolence were positively correlated, but neither was not statistically significant.

3.4.5 Discussion and conclusion

This study's aim was to investigate the association between the psychological concept benevolence with perceived stress, emotional exhaustion, depression, anxiety, self-compassion, and satisfaction with life. The questionnaire used was newly translated, so this study was the first of its kind to the authors' knowledge. The idea behind using statistical cross-sectional analysis was to get an understanding of how the construct was associating to more common construct within the field of mental ill-health. According to Martela and Ryan (2015), benevolence builds internal motivation, competence, autonomy, and connectedness, all of which are important for mental health and well-being in personal and work life. The results demonstrated a moderate correlation with self-compassion and stress and a weak correlation to emotional exhaustion and depression. This indicates that benevolence might not be a buffer for depression or emotional exhaustion at the workplace. Based on the results from this study, it could be interesting to further investigate the relationship between the variables that shows a moderate correlation (e.g. self-compassion and benevolence, self-compassion, and stress.

3.4.6 Strengths and limitations

The main strength of this study was that, to our knowledge, this was the first evaluation on how the concept of benevolence correlates with other more well researched concepts relevant in occupational health. Another strength is that we found the same pattern of associations in both study samples. This result can guide future randomized controlled studies of the possibility of changing outcome measurement levels. A major limitation in this study is the level of analysis, we abstained from using regression analysis because the theoretical background regarding the role of predictors for such models was lacking. Future studies with experimental designs are needed to be able to make any causal conclusions. Other limitation is that not much demographic data was collected. Moreover, the two datasets only contained office workers in three different organizations in study I and self-selected participants to an intervention program from two different workplaces in study II.

3.5 OUTCOME MEASURES

Below are all the outcome measures used in the studies for this thesis.

3.5.1 Hospital Anxiety and Depression Scale (HADS)

The Hospital Anxiety and Depression Scale (HADS) is a screening scale developed by Zigmond and Snaith (1983) to measure anxiety and depression. It consists of 14 items, of which 7 items target anxiety and 7 target depression. Items are rated on a Likert scale ranging between 0 to 3; each subscale has a score range of 0-21. A score of 8 indicates a clinical level of either symptom. Regarding anxiety, a change of 1.3 is considered a slight improvement, whereas a change of 1.4 is considered a slight improvement for the depression scale (Puhan et al., 2008). The scale has a good internal consistency α = .89-0.98 (Zigmond & Snaith, 1983). The scale has been evaluated in a Swedish non-clinical sample α = 0.84 for the anxiety subscale and α = 0.82 for the depression subscale (Lisspers, Nygren & Söderman, 1997).

3.5.2 Perceived Stress Scale (PSS-10)

Perceived Stress Scale (PSS-10; Cohen & Williamson, 1988). PSS-10 is a 10-item version of the original PSS-14, a widely used instrument to assess perceived stress. The scale consists of questions regarding thoughts and feelings over the last month, rated on a five-point Likert scale (0 = Never, 4 = Very often). The maximum total score is 40, the minimum total score is 0. Example of a question: "*Felt that you were unable to control the important things in your life?*" The Swedish translation has been developed by Eskin and Parr (1996) and demonstrated good internal consistency in a study by Nordin and Nordin (2013) demonstrated good internal consistency (Cronbach's α =.84).

3.5.3 Perceived Stress Scale (PSS-14)

The 14-item Perceived Stress Scale (PSS-14) developed by Cohen et al. (1983) is a widely used instrument in the assessment of perceived stress. The PSS14 is not a diagnostic instrument so there is not a clear cut-off score for different levels of stress. The scale consists of items, some reversed, relating to the respondent's thoughts and feelings over the last month, each of which is rated on a five-point Likert scale (0 = Never, 4 = Very often). Example of a question: "*In the last month, how often have you been upset because of something that happened unexpectedly?*" The maximum possible score is 56, the minimum

total score is 0. The Swedish translation was developed by Eskin and Parr (1996) which has good internal consistency (Cronbach's α = .75).

3.5.4 Self-Compassion Scale (SCS)

The Self-Compassion Scale (SCS) used in this thesis was translated into Swedish by Strömberg (2012, unpublished). This 26-item scale (Neff, 2003b) includes three dimensions representing self-compassion: Self-kindness, Common humanity, and Mindfulness, where each of these also includes three dimensions representing lack of self-compassion: Self-judgment; Isolation; and Over-identification (reverse coded items). Responses are rated on a 5-point Likert scale, (1 = Almost never to 5 = Almost always). Example of question: "*When I am going through a very hard time, I give myself the care and tenderness I need.*" Some items were reversed to indicate a high level of self-compassion.

3.5.5 Self-Compassion Scale-Short Form (SCS-SF)

The Self-Compassion Scale-Short Form (SCS-SF; Raes et al., 2011) comprises 12 items, some reversed, rated on a 5-point Likert scale (1 = Almost never, 5 = Almost always), resulting in a minimum score of 12 and a maximum score of 60. This short-form scale has demonstrated good internal consistency (Cronbach's α =.86) and a near-perfect correlation with the long-form (Neff, 2003b). Example of question: "*When I fail at something important to me I become consumed by feelings of inadequacy*". The Swedish version of the short form used in this thesis was translated by B. Strömberg (2012, unpublished) and has demonstrated good internal consistency in a study by Wallin and Wennlund (2014) demonstrated good internal consistency (Cronbach's α =.90).

3.5.6 Satisfaction With Life Scale (SWLS)

This 5-item short scale was developed by Diener et al. (1985) and measures global life satisfaction. Responses are measured on a seven-point Likert scale (1 = strongly disagree to, 7 = strongly agree). Evaluation of the total scores is divided into seven categories: 31–35: very high score; extremely satisfied, 26–30: high score; satisfied, 21–25: average score; slightly satisfied; 20: neutral; 15–19: slightly below average in life satisfaction; slightly dissatisfied; 10–14: dissatisfied; and 5–9: extremely dissatisfied. An example of question: "*In most ways my life is close to my ideal*". Internal consistency measured using the five-item scale on a non-clinical population, had Cronbach's α of .88 (Kobau et al., 2010).

3.5.7 Clinical outcomes in routine evaluation-outcome measure (CORE-OM)

Clinical outcomes in routine evaluation-outcome measure (CORE-OM; Evans et al., 2000) aims to measure psychological problems using 34 items, some reversed, that cover four domains: 1) well-being, 2) symptoms, 3) functioning, and 4) risk. It takes five to ten minutes to complete. The questions are about how respondents have been feeling over the last week and are rated on a five-point Likert scale (0 = not at all, 4 = most or all of the time). Scores below 10 are considered in the clinical range and higher scores are associated with severe mental health. An example of question: "*I have felt tense, anxious or nervous*". Internal consistency measured using the total scale on a non-clinical population, had Cronbach's α of .94 (Evans et al., 2002) and test–retest was good (r =.90). The Swedish version of the scale has a high internal consistency (Cronbach's α =.93) and test–retest reliability (r =.85) (Elfström et al., 2013).

3.5.8 Toronto Alexithymia Scale (TAS-20)

Developed by Parker et al. (2003), the TAS-20 assesses alexithymia. It is comprised of three subscales: 1) difficulties identifying feelings, 2) difficulties describing feelings to others, and 3) externally oriented thinking, (i.e. a preoccupation of external events rather than internal). It includes 20 items, some reversed, rated on a five-point Likert scale resulting in a maximal total score of 100 and a minimum total score of 20. An example of a question: "*I am often confused about what emotion I am feeling*". The Swedish translation used in this thesis has shown good internal consistency (Cronbach's α =.83) and the three-factor model of alexithymia has demonstrated successful replicability in a Swedish sample of undergraduate students (Simonsson-Sarnecki et al., 2000).

3.5.9 Benevolence scale (BS)

Martela and Ryan (2015) developed a 4-item scale to assess benevolence or the feeling that one has been benevolent. Responses are on a 4-point Likert scale (1 = Not at all true to 4 = Very true) and the items are: 1) *"I feel that my actions have a positive impact on the people around me,"* 2) *"The things I do contribute to the betterment of society,"* 3) *"I have been able to improve the welfare of other people,"* 4) *"In general, my influence in the lives of other people is positive."* The scale was translated into Swedish and then translated back as the general procedure before using it in the study. This scale was used in study IV; Cronbach's α was 0.85 in study 1 and 0.84 in study 2, both of which are considered good internal consistencies.

3.5.10 Symptom Checklist, Core Depression Subscale (SCL-CD6)

This scale is a subscale of the SCL-90, which measures core psychological and physical symptoms of depression during the last week. It has been validated against other comprehensive measures of clinical depression and found to have good validity and psychometric properties (Magnusson Hanson et al., 2014). The level of depressive symptoms is rated on a 5-point Likert scale (1 = Not at all to 5 = A lot, reflecting the perceived symptoms in the previous week. Example items: "*Blaming yourself for things*" or "*Worrying too much about things.*"

3.5.11 Maslach Burnout Inventory, Emotional Exhaustion Subscale (MBI-EE)

This is a subscale from the Maslach Burnout Inventory general survey (MBI-GS) (Schaufeli et al., 1996; Schutte et al., 2000). The subscale has five items and score range from 1 (a few times a year or less/never) to 6 (every day) on a Likert scale. Two examples' items are: *"My job makes me feel emotionally drained", "I feel burned out by work."*

4 GENERAL DISCUSSION

4.1 EVALUATING A COMPASSIONATE MIND TRAINING PROGRAM

Stress-related mental ill-health is a global phenomenon warranting new effective methods of treatment. When this doctoral project was planned, only a few randomized controlled trials had been conducted on compassionate mind training and had been applied to both clinical and nonclinical populations. Therefore, the primary aim of this thesis was to develop a Swedish program to assess perceived stress and self-compassion and measure the impact of compassionate mind training compared to various active control interventions in the nonclinical populations of university students and employees. Results from the included studies showed minimal or no effects on mental health measured as perceived stress, anxiety, depression, and self-compassion on the populations studied. The potential of digitalization in health care has been acknowledged by the studies that assessed the use of health apps. One study in this thesis addressed this by creating a smartphone application of compassion training. This doctoral project also studied benevolence, in relation to other concepts. The results in study IV indicated a positive though weak-to-moderate relationship between benevolence and self-compassion and negative relationships with stress, depression, and emotional exhaustion, which encourages further study of intervention aiming to increase benevolence.

4.2 METHODOLOGICAL CONSIDERATIONS

The included studies examined compassionate mind training in different populations mainly using RCTs. Hence, they give a perspective on the effect of the intervention investigated. Benefits of using the RCT approach are the randomization and comparison with an active and passive control group, and by that, controlling for observable factors that could impact the results. RCTs are considered the gold standard in intervention research if the study is well designed, conducted, and reported. Also, the selection of the study population, intervention arms, and outcomes of interest are important. In this doctoral project, the study populations were university students and employees, both groups with self-defined reported high levels of stress and anxiety and depression symptoms. This was the starting point for formulating the hypothesis regarding exploring the effect of compassionate mind training on these populations.

4.3 BRIEFLY ON STATISTICS

Statistical significance is the most common way in science to decide whether a hypothesis should be rejected or accepted. In statistical testing a null hypothesis implies that there is no difference between two groups of data, and if there is an observed difference it is due to a coincidence. There are certain proceedings to consider in hypothesis testing for example choosing a probability level that minimize the risk of erroneously rejecting the null hypothesis, thereby making a type I error. When designing a test an alpha level is decided to keep the type I error rate below a certain limit, usually 0.05 (5%) in psychology research which indicates that it is a 5% chance that an accepted alternative hypothesis might be wrong. The possibility to obtain statistical significance is also affected by sample size. With a smaller sample size, there is an increased risk of making an underestimation of the possible difference, making a type II error. A type II error is the conclusion that no difference exists when in fact there is a difference. The type II error rate is related to the power of the analysis, the sample size. Before a study is initiated it is standard to make a power analysis in order to estimate the number of participants required to be able to draw meaningful conclusions (Clark-Carter, 2010; Field, 2017).

Adding the perspective of the effect size is of importance understand the magnitude of a difference independent of the sample size. There has been a discussion over the years regarding the relative value of p-value and effect size (Sullivan & Feinn, 2012). Sohlberg and Andersson (2005) claim that the effect size can be of importance even though a test has a nonsignificant result. The authors suggest that with a low p-value but still over .05 and a high effect size, the results can point to a difference worth considering. It is also important to take into consideration what kind of study is being conducted when analyzing the effect size in relation to the statistical significance. The effect size is for instance of use when comparing the effect of an intervention among several studies, such as in a meta-analysis.

4.4 STATISTICS USED IN THE THESIS

In all three studies, the sample sizes were small. With a low power the likelihood to detect a small effect is low. In general, having a high power allows drawing accurate conclusions from the sampled data as the influence of outliers on the outcome is diminished. All three RCTs in this thesis are affected by the consequences of low power, resulting in an increased risk for type II errors and difficulties with generalizing the results (Field, 2017). With large samples it is easier to find statistically significant results for small effects. In smaller samples it is suggested to interpret the effect sizes and to analyze if they matter in practice

(Sohlberg & Andersson, 2005). In study I and II, the decision for how many participants to require was based on previous studies. A key study design step for conducting a research study is to do a power calculation. Usually .80 is the goal for a study to have enough power, which means that there is a 20% risk of missing a no-random difference between two groups. If the risk is larger (low power), a type II error is more likely to occur.

It is always important to consider that confounding factors can impact the results. Therefore, the aim was to conduct RCT studies with both active and passive control groups. In study I, the statistics were determined with a linear mixed-effect regression model (Heck et al., 2014; Liu et al., 2012). The model was applied because it handled dependence and missing data better than using other forms of regression analysis. Studies II and III used multilevel modeling (MLM) because there were repeated measurements (pre-, and post-, and follow-up), and the model provides advantages in this situation (e.g., accounting for missing data over time points by including all available observations), which generates more information from the dataset and provides optimal statistical power compared to ANOVA or ANCOVA (Hesser, 2015). Advantages of multilevel modeling include that it can provide information about individual change and the participants can function as their own control. Also, this statistical technique provides more efficient estimators than other regression models.

In study IV, a cross-sectional, correlational analysis was performed to investigate the relationships between a new measure of benevolence and some of the main outcomes included in the other studies in this thesis. The reason for choosing a cross-sectional statistical analysis was that a theoretical background regarding potential causality was mainly lacking, and hence regression models and the like were deemed to be too speculative when using cross-sectional data.

4.5 STRENGTHS

Study I used an RCT to compare a Swedish version of compassionate mind training with an active control group, which had not been conducted before. The randomization was done after the first measurement. In study II, compassionate mind training was offered via a smartphone app to university students. A strength of this study was that no prior digital psychological compassion-based program in Sweden had been tested in an RCT on university students (to the authors' knowledge). The program was tested on a small pilot group before using it side-by-side with the mindfulness application. A second strength was

creating an app to offer self-help to students who otherwise might find it difficult to seek help in person. Also, this program was based on well-established psychological theories. Curiously, more men participated in study II than in study I, which could be due to the fact that training was only via the smartphone. The results from study II can be compared to later research (e.g., Northover et al., 2021) testing online self-compassion training for 9 weeks. Those findings, similar to study II in this thesis, were significant for self-compassion, depression, and perceived stress (Northover et al., 2021). Also, Halamová et al. (2020) examined an online compassion mind training for a nonclinical population. This was a shorter program and the participants received email every day for 14 days with a new compassion meditation practice. The results showed no significant change in self-compassion but improvements in self-criticism. This can be compared with the results from study II in this thesis, which had the further strength of using an app to enable more freedom than an online program even though today many use their email on the phone. These findings are promising as they suggest that compassionate mind training can be delivered to nonclinical populations without the direct involvement of professionals educated in psychology or CFT.

The main strength of study III was that compassionate mind training was compared in an RCT with an active control. Most of the compassion research in work organizations used qualitative methods, and no RCTs studying compassion or self-compassion at work had been published at the time of our study. Another strength of this study was the use of physical exercise compared to compassionate mind training to determine which training is the most effective one regarding perceived stress, anxiety and depression symptoms, self-compassion, and satisfaction with life. This study validated that compassionate mind training as a psychological treatment for stress-related problems could, just as physical exercise, be a choice for recommendations for stress reduction. A strength of study IV was that we tested a new questionnaire of benevolence and its associations with some of the main outcome variables in the other studies in this thesis to investigate the relationship and to get an overview of how they relate to each other.

Overall, the strength of this thesis is that a Swedish compassionate mind training program was evaluated using different active control groups (affect-focused training, mindfulness practice, and physical exercise), which are all well-established methods to strengthen mental health.

4.6 LIMITATIONS

In this section the limitations in this doctoral thesis will be discussed. First, all the studies had small sample sizes. When the sample size is small, the value of the results are difficult to generalize. In studies I and III there was an active control to compare with, but it would have been better to also include a passive control group (e.g., waitlist). That was done in study II, which had three groups, but the three groups had smaller samples. More limitations are that no long-term follow-up was done in any of the studies and no other measurement besides self-reporting was used.

All RCTs had a convenience sample, so self-selection bias could be present. The findings thus cannot really be generalized to the general population. Another limitation is that both study I and study III participants were divided into small groups, which can be considered both too time-consuming and costly for organizations that might implement these programs. Hence, a self-help program using a smartphone app was tested in study II for more flexibility.

Just as in study I, the main limitation in study II regarded the potential self-selection bias. Moreover, the use of the apps was low, only two or three times per week on average, compared to the recommended 10 minutes a day. There was a large variation between the participants where some used the apps several times a day and others only used it a few times during the whole program. It would have been of interest to investigate the effect over a longer period of time to see if the participants would use the app more in time or this dosage of use is enough to show an effect over time on the outcome measures.

In study III, the recruitment strategy was done by the organizations' human resource departments, which could have negatively affected the participants' autonomous decisions to take part in the study. Screening was done based on participants' experiences of perceived stress and not by any screening questionnaire. We also had limited sociodemographic information about participants. Adherence in the control group could furthermore be something to follow up on as, even though the participants in the control group stated that they had performed physical exercise, adherence was not registered beyond the recommended hours per week. It could have been valuable to get information on exactly how much they exercised and what kind of exercise they did.

In study IV, the design was cross-sectional, so no conclusions regarding causality could be drawn. Also, as this was the first study, as far as we know, to test this new benevolence scale, no previous psychometric data could be used as comparison to this study.

4.6.1 Self-reports

Outcome measures relied on participant self-reporting. Using self-reports implies a certain risk for errors within the measurement by misreporting because they require that the individual give truthful answers and possess a certain level of self-knowledge. This can be difficult when it comes to self-compassion because the concept requires that the individual know what it means; the same is true for alexithymia. Learning about the concept of self-compassion in training can therefore impact the postintervention measurement. Therefore, it would have been preferable if a physiological measure, such HRV, had been used as well to investigate other potential objective changes that might have occurred as well as including other methods such as behavior changes or interviews that might have revealed whether the participants had learned what they were supposed to learn.

4.6.2 The role of the context

The environment in which the different studies in this doctoral project took place also matters. Even though the evaluation focused on the psychological effect on a group level and was measured by self-reports, the context needs to be considered. A limitation in this thesis is that we did not analyze contextual factors. As humans are affected by a broader context (e.g., historic, geographic) and not only by relationships, a recommendation would also be to integrate a social ecology framework in future studies (Cikara et al., 2022).

4.7 IMPLICATIONS OF THE FINDINGS

As stated previously, the overall findings in this thesis indicate that compassionate mind training as a method could improve self-compassion and reduce perceived stress and depression symptoms in university students, but the improvements were relatively small. While the amount of research on compassionate mind training, especially self-compassion as an outcome measure, is increasing, there is still a need for more robust RCTs with larger sample sizes. The self-help program via smartphone in study II would be of interest to test in an organizational setting, such as in study III, which would give participants more time to practice on their own and at times chosen by themselves to make the training more flexible. This can be important as participating in a group 2 hours every week can be stressful for someone who is already experiencing high levels of stress. This gives

participants an increased sense of control over when to practice. However, it might also be difficult to practice alone, so group training remains a viable option. The results from study IV regard benevolence as an aspect of internal motivation and its association to stress, depression and anxiety symptoms, and self-compassion. The outcome measures in this thesis varied because of progress in the doctoral project. Both the long and short form of the self-compassion scale were used, and we changed from using the perceived stress scale with 14 item to a scale with 10 items and better psychometric data. Regarding the scale of hospital anxiety and depression, the scores were separated in study I and analyzed using the total score in studies II and III. A conclusion is to use the short-form self-compassion scale instead of the long form to minimize the number of items and then use the perceived stress scale (PSS10). A suggestion is to analyze the anxiety and depression scale separately for a more in detail overview when using the hospital anxiety and depression scale (HADS).

5 FUTURE DIRECTIONS

The aim of this doctoral thesis was to develop a Swedish compassionate mind training program and to examine its effects on participants' perceived stress, anxiety, depression, and self-compassion on university students and employees at the workplace in randomized controlled trials. Developing a compassionate mind training program was quite a new field when I started my doctoral journey. Only a few RCTs had been conducted on CFT on clinical populations and mainly with waitlist control, so the evidence for compassionate mind training was unclear which they still are. The results from this doctoral project add to the growing knowledge on compassionate mind training, but the results varied among the studies which are in line with previous findings - mainly that larger effects was found when compassionate mind training was compared to a waitlist, but most often nonsignificant improvements were found when using an active control (Kirby et al., 2017a; Wilson et al., 2019). Therefore more research is needed.

5.1 THE LENGTH OF THE PROGRAM

In a meta-analysis of studies in clinical populations, Craig et al. (2020) concluded that at least 12 hours of compassionate mind training is recommended to achieve a sustainable effect of the training. In nonclinical populations the amount of time and length seem to be similar: 8-week programs including sessions of 1.5–2 hours once a week (Irons & Heriot-Maitland, 2020). The program we built for this doctoral project at first only consisted of 5 weeks of 2 hours each session. In studies II and III, the programs were 6 weeks, and in study III it was 12 hours in total, homework not included.

5.2 COMMON HUMANITY AN EFFECT OF COMPASSIONATE MIND TRAINING?

In the studies included in this thesis, many participants have given the feedback that the common humanity part of being in a group has been helpful to gain the feeling of not being alone; it strengthens that feeling of belonging. However, in study II, in which university students used a smartphone app to train compassion and thus did not meet each other, findings still showed significantly decreased levels of perceived stress; overall, the results in study II showed stronger effects on the outcomes than in study I, in which university students participated in a group format. Importantly, the program in study II was one module longer, which could explain the stronger effect, but for future studies examining the common humanity more in-depth research is recommended.

6 CONCLUSIONS

This doctoral thesis evaluated compassionate mind training feasibility, effectiveness, and validity in the two populations of university students and employees. Compassionate mind training as an on-site group intervention was found to improve depression in university students compared to active control. Compassionate mind training as a self-help intervention via smartphone application shows significant results in reducing perceived stress, alexithymia and increased self-compassion compared to waitlist but not in relation to active control. For employees at the workplace compassionate mind training improved self-compassion compared to active control but did not statistically improve satisfaction with life or reduce anxiety or depression symptoms, perceived stress, or global distress.

To conclude, I acknowledge the limitations with small sample sizes, therefore the effects of compassionate mind training should be further scrutinized in larger, more rigorous studies. A conclusion from studying the field of the different compassion programs it that a vast diversity exists in what is termed as compassion and self-compassion training (from listening to audio files for a few weeks, to whole psychological programs) and various outcome measures in studies, which means comparisons of different studies is a challenge. More research might help with this problem.

7 ACKNOWLEDGEMENTS

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